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THESIS

TAXONOMY OF OLETHREUTINAE (LEPIDOPTERA: TORTRICIDAE) OF THONG PHA PHUM NATIONAL PARK, KANCHANABURI PROVINCE, THAILAND

NANTASAK PINKAEW

GRADUATE SCHOOL, KASETSART UNIVERSITY
2006

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THESIS

TAXONOMY OF OLETHREUTINAE (LEPIDOPTERA: TORTRICIDAE) OF THONG PHA PHUM NATIONAL PARK, KANCHANABURI PROVINCE, THAILAND

NANTASAK PINKAEW

A Thesis Submitted in Partial Fulfillment of
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Nantasak Pinkaew 2006: Taxonomy of Olethreutinae (Lepidoptera: Tortricidae) of Thong Pha Phum National Park, Kanchanaburi Province, Thailand. Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Angsumarn Chandrapatya, Ph.D. 578 pages.

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A taxonomic study of Olethreutinae (Lepidoptera: Tortricidae) in Thailand was based on a survey of species in Thong Pha Phum National Park. Collections were made in 32 sites representing 3 habitat types of hill evergreen forest, dry evergreen forest and mixed deciduous forest. More than 700 specimens of Olethreutinae were collected with blacklight on 145 nights during 2001-2004. The survey resulted in collection of 249 morphotypes divided into 6 tribes namely Gatesclarkeanini, Bactrini, Olethreutini, Enarmoniini, Eucosmini, and Grapholitini. Of these, 109 species in 62 genera are identified and 54 species are new records for the park and Thailand. The survey also included 87 morphotypes that can be identifiable to 35 genera, but not to species level and 53 morphotypes cannot be placed in any known genus or species. *Eucoenogenes bicuculla* n.sp. and *E. vaneeae* n.sp. are described as new to science and one new combination of *E. munda* (Diakonoff), of which published in Pinkaew *et. al.* (2005). A checklist of species associated with each habitat type is also provided.

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Student's signature

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15 / 05 / 06

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Nantasak Pinkaew

March, 2006

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ABBREVIATIONS OF INSTITUTION

BMNH	=	The Natural History Museum, London, England
DEIB	=	Deutsches Entomologisches Institut, Berlin, Germany
IZAS	=	Institute of Zoology, Chinese Academy of Sciences, Beijing, China
MNHN	=	Museum National d'Historie Naturella, Paris, France
NHMB	=	Naturhistorisches Museum, Basel, Switzerland
OPU	=	Entomological Laboratory, Osaka Prefecture University (formerly University of Osaka Prefecture), Sakai, Japan
RMNH	=	Nationaal Natuurhistorisch Museum, Leiden, The Netherlands
SAMA	=	South Australian Museum, Adelaide, Australia
TMB	=	Termeszettudomanyi Museum Allattara (Hungarian Natural History Museum), Budapest, Hungary
UMCE	=	University Museum, Cambridge, England
USNM	=	National Museum of Natural History, Washington, DC, USA
ZMUC	=	Zoological Museum, University of Copenhagen, Denmark
ZMAS	=	Zoological Institute, Russian Academy of Science, St. Petersburg (Leningrad), Russia
ZSM	=	Zoologische Sammlung des Bayerischen Staates, München, Germany
ZSIK	=	Zoological Survey of India, Kaiser Castle, Banaras Cantt

TAXONOMY OF OLETHREUTINAE (LEPIDOPTERA: TORTRICIDAE) OF THONG PHA PHUM NATIONAL PARK, KANCHANABURI PROVINCE, THAILAND

INTRODUCTION

Tortricidae is one of the largest families among the microlepidoptera and the sole family in superfamily Tortricoidea. The family includes almost 9,000 known species of small to medium sized moths worldwide (Horak and Brown, 1991; Brown, 2002, 2005). The family has been divided into two subfamilies: Tortricinae and Olethreutinae, with the former including taxa previously assigned to Chlidanotinae (Horak, 1999). The family is more strongly represented in temperate and tropical upland regions than in the lowland tropics and probably reaches its greatest diversity in the moss forests of tropical latitudes (Robinson *et. al.*, 1994). The Olethreutinae includes more than 4,286 described species in 355 genera and many undescribed taxa, especially in the tropics (Horak and Brown, 1991; Brown, 2002, 2005).

Larvae of many species of Tortricidae feed inside rolled leaves and are commonly known as leafrollers. Larvae of other tortricid species feed inside stems, roots, and fruits of plants. Members of the Tortricidae are among the most important pests in many regions of the world and include many species in tropical regions that are important pests of agriculture, forests and ornamental plants. In Thailand, many species of tortricid larvae attack several agricultural plants and forest trees (Hutacharern and Tubtim, 1995; Lewvanich, 2001).

Thong Pha Phum National Park is an important part of the protected forest area in Kanchanaburi Province, western Thailand and was selected for the survey area. The prestine forest is a setting for sustainable forest conservation. This National Park is a complex mountain range, which located in junction of biogeographic realms; Indo-Chinese, Indo-Malayan, Indo-Burmese and Sundaic. Futhermore, the high local precipitation and humidity and the differences of ambient temperatures and elevations are causative factors producing the high diversity of floras and faunas.

OBJECTIVES

1. Conduct a survey and inventory of species in Thong Pha Phum National Park.
2. Describe and illustrate the morphology of species of Olethreutinae occurring in Thong Pha Phum National Park.
3. Describe and name new species that are new to science.
4. Prepare checklist of species associated with habitat types.

LITERATURE REVIEW

Systematics and current classification

In the tenth edition of Systema Naturae (Linnaeus, 1758), the starting point of zoological nomenclature, Linnaeus used the name Tortrices for species that would later be included in Tortricidae. Latreille in 1802-1803 was the first to use the name Tortricidae for this family, mentioning that it is a correction of Linnaeus's name Tortrices.

The name Olethreutinae was proposed for the first time by Walsingham in 1895 (Razowski, 1976) as an emandation of Olethreutae Hübner, which was commonly used after 1806. Prior to Walsingham, Meyrick proposed the name Grapholithinae in 1882 and Epibleminae in 1895 for this subfamily but Olethreutinae has nomenclatural priority and has been used in most treatments, e.g., Heinrich (1923, 1926), Obraztsov (1958, 1960, 1961, 1965, 1967), Diakonoff (1973), Kuznetsov and Stekolnikov (1973), Horak and Brown (1991), Horak (1999) and Brown (2005). Futhermore, in 1918 Walsingham was the first to elevate the subfamily to family status as Olethreutidae. Other authors who have been regarded Olethreutidae as a separate family from Tortricidae include Heinrich (1923, 1926), Bradley (1953), Common (1957), and Clarke (1958, 1971).

Horak (1984) summarized the history of classification of Tortricidae from earlier publications. The earliest classifications were based on wing pattern and coloration (Guenée, 1845) as well as characters of antennae, shape of the wing, and wing venation (Herrich-Schäffer, 1847-1856). Lederer (1859) erected several genera based on secondary sexual characters, such as hair pencils and costal folds in males. Meyrick (1895) used external morphological characters, with emphasis on wing venation, for proposing an early phylogeny of Tortricidae. Meyrick later described a large number of species of Tortricidae from Southeast Asia, the types of which were catalogued and illustrated by Clarke (1955, 1958). Genitalic characters were first used for tortricid taxonomy by Dampf (1908). Heinrich (1923, 1926) used genitalic

characters, wing venation, and other characters to define genera and higher categories of Olethreutinae as well as to propose a phylogeny for these genera. Kuznetsov and Stekolnikov (1973, 1977) used musculature of male genitalia to propose phylogenetic relationships of tribes of Tortricidae, although their hypotheses have not been accepted universally (Horak, 1984). The most recent treatment of tribes and phylogenetic relationships of Olethreutinae were provided by Horak and Brown (1991) and Horak (1999).

At present the Olethreutinae is divided into eight tribes (Horak, 1999; Brown, 2005). Gatesclarkeanini includes 18 species in four genera that occur in Southeast Asia and the South Pacific area (Diakonoff, 1973; Brown, 2005). Bactrini includes 121 species in seven genera and is most diverse in the Southern Hemisphere, especially tropical Asia (Diakonoff, 1956, 1963; Brown, 2005). Endotheniini includes 47 species in three genera (Brown, 2005). Microcorsini includes 33 species in one genus and occurs on all Southern Hemisphere continents as well as the Oriental Region and the Southern United States (Razowski, 1976; Horak, 1999; Brown and Brown, 2004). Olethreutini includes 1,128 species in more than 144 genera and occurs in all zoogeographic regions with greatest diversity in the Oriental and Holarctic regions (Diakonoff, 1973; Park and Park, 1988; Brown, 2005). Enarmoniini includes 299 species in 30 genera (Horak, 1999; Brown, 2005). Eucosmini includes 1,715 species in more than 125 genera and is most diverse in the Holarctic region (Horak and Brown, 1991; Brown, 2005). Grapholitini includes 897 species in about 50 genera and is most diverse in the Holarctic region, although other species occur world wide (Horak and Brown, 1991; Bae and Park, 1997; Komai, 1999; Brown, 2005).

The Tortricidae family is easily recognizable by a combination of characters such as unscaled proboscis, presence of ocellus and chaetosemata, porrect or upcurved labial palpi that are never horn-shaped, minute maxillary palpi generally not visible on undissected specimens, usually rough head scaling but with the scaling on the lower frons very short and upwardly oriented. Three subfamilies, Tortricinae, Chlidanotinae and Olethreutinae have become generally accepted within the Tortricidae (Horak,

1999). The Olethreutinae differs from other subfamilies of Tortricidae based on following characters, as summarized by Horak and Brown (1991): 1) antenna with one ring of scales on each flagellar segment; 2) hindwing usually with cubital pecten dorsally; 3) male genitalia without transtilla, gnathos reduced, aedeagus fused with anellus and juxta, rarely with coecum developed, often with deciduous and non-deciduous cornuti, valva strongly sclerotized except for basal excavation, costal hook usually present, cucullus well defined and often delimited by neck; 4) female genitalia with sterigma usually not connected with anterior apophyses, ductus bursae often with colliculum in form of ring, often with separate sclerotized ring near inception of ductus seminalis, signa present or absent, often two present. In addition, many Olethreutinae are distinctive in having males with a costal fold and secondary sex scales on the wings or body.

The present catalogue of world Tortricidae (Brown, 2005) is a necessary reference for tortricid taxonomists' group because it lists all species goes through 2004, arranged by tribe, with the included genera in alphabetical order, and species in alphabetical order beneath the appropriate genus. Synonym, subspecies, and misspelling are listed in chronological order under the appropriate taxon. The author, year, reference, type, sex of type, and deposition of type of each taxon are also included.

Morphology

Egg

The tortricid egg is of so-called flat type, with the long axis horizontal and with a micropyle at one end. It is roundish to oval, dome-shaped, anal usually flattened. The globose, lemon-shaped egg of Pricanthini (Powell and Common, 1985) is most unusual for family and possibly an ancestral trait. The chorion of tortricid eggs may be smooth, irregular rugose or reticulate with pronounced ridges (Horak and Brown, 1991; Scoble, 1992; Horak, 1999). The eggs are usually covered with a

secretion from the female accessory gland, and in some species scales from the anal tuft or wings adhere to the egg mass (Bradley *et. al.*, 1973).

Larva

The tortricid caterpillar is typical for a generalized ditrysian lepidopterous larva with only primary and subprimary setae. Its body is divided into a heavily sclerotized head, a thorax with a three pairs of segmented legs, and abdomen with ventral prolegs on segments 3-6, usually slightly tapering towards apex, and anal proleg on segment 10. The head is usually semiprognathus (Horak, 1999), and diagnostic structures include the shape of adfrontal area and spinneret, the position of six stemmata, and the development of the mandible. The first thoracic segment bears a dorsal sclerotized plate, the thoracic shield, which may be light or dark, similar to the anal shield on the last abdominal segment (Beeke and De Jong, 1991). The L-group setae at the prothorax are trisetose, which distinguishes them from pyralids. Setae L1 and L2 are close together on abdominal segments 1-8. The small sclerotized hooks (crochets) arranged in a circle on the ventral prolegs may all be of one length (uniordinal) or of two or three alternating lengths (bi- or triordinal). On the anal prolegs the crochets are arranged in a continuous row, where as they are divided in some Gelechiidae (Brown, 1987). A structure to eject the feces from the shelter (anal fork) is often present above the anus, but this structure is usually absent in borers. The prongs of the anal comb are straight, whereas in Gelechiidae they are curved (Scoble, 1992).

Pupa

The tortricid pupa is adecticous, obtect and with several movable abdominal segments. The maxillary palpi are nearly always visible as small sclerites below the eyes. Two longitudinal, more or less defined depressions may be present dorsally on the mesothorax. There are ten abdominal segments, with segments 4-6 in the female and 4-7 in the male movable, abdominal segments 7-10 fused in the female and 8-10 fused in the male (Bradley *et. al.*, 1973). The abdomen has two transverse rows of

spines on the dorsum of each segment. The arrangement of the dorsal spines on the terminal segment is of taxonomic importance, especially in the male in which they are more strongly developed. Anal and genital openings are present ventrally on the terminal segments, with the genital opening on segment 9 in the male and on segment 8 in the female. The tip of the abdomen bears a number of hooked setae and is often produced into a cremaster to facilitate anchoring of the pupa in its shelter (Horak, 1991, 1999; Beeke and De Jong, 1991; Scoble, 1992). The pupae of Grapholitini and many Eucosmini lack a cremaster, but rather have a row of strong spines on the cauda of abdominal segment 10 (Komai, 1999).

Adult

Head: The tortricid head scaling is quite distinct, with the vertex being rough-scaled, usually with large scale tufts protruding anteriorly between antenna (Horak, 1999). The scales on the upper frons are usually elongate, always directed forwards with some appressed (Bradley *et. al.* 1973), while the lower frons is covered with short, dorsally directed scales. A narrow band of irregularly arranged scales follows the posterior margin of the compound eyes (Horak, 1991).

The large compound eye is spherical, glabrous or with a band of microtrichia along its margin. Sparse setae are present on its surface, arising between ommatidium. Ocelli and chaetosemata are usually well-developed. The chaetosemata is a pin-cushion like domed area with narrow, modified scales (Horak, 1991).

The antennae are always filiform, reaching to about the middle of forewing or less than 2/3 length of forewing (Bradley *et. al.*, 1973; Horak, 1999). The scape and pedicel are ummodified, densely scaled, with a small intercalary sclerite present between these two basal segments. The number of flagella segments varies between individuals as well as between species, apparently correlated with size of the moth (Brown, 1980). Each flagellar segment has a single ring of scales in Olethreutinae, whereas all other Tortricidae, except for some Spargonothini have two rings of scales on each segment (Horak, 1991, 1999). The flagellar base may be notched or

expanded and flattened through secondary sexual modifications in males of some genera in Eucosmini.

Olethreutine mouthparts are similar to those of other higher Lepidoptera. The maxillary palpus is always small in tortricids with four scaled segments to a naked unsegmented remnant (Horak, 1999). The two grooved galea form a well-developed proboscis that is entirely unscaled. The labial palpi are well-developed, three-segmented, porrect and ascending (Fig. 1). The second segment is relatively long, sinuate and distally widened, and the third segment is relatively short and angled forward or downward, often almost covered with scales from second segment (Kuznetsov, 1987). Rarely, the labial palpi are upcurved, with a rather slender and curved second segment. (Horak, 1991).

Thorax: The scales of thorax are smoothly appressed above, although the scales may from a posterior crest of raised scales in some genera (Bradley *et. al.*, 1973). However, the posterior crest is a very ephemeral structure that can be easily lost without the damage being apparent (Horak, 1991). The pronotum has a pair of flap-like, scaled patagia and the mesonotum has a pair of triangular tegulae anteriorly (Horak, 1999).

Legs: The olethreutine legs are well-developed and typical for ditrysian Lepidoptera. The fore tibia has a comb-shaped epiphysis, the mid tibia has a pair of apical spurs, always with modified scaling of a spiny appearance, and the hind tibia has two pair of spurs, one medial and one apical. Several groups of Olethreutinae have males with a modified hind tibia, often with a narrow, long, scale pencil and/or various large clumps of modified scales along the inner surface. The five-segmented tarsus usually has spines near the apex of segment 1-4, reduced in some groups (Horak, 1991, 1999)

Wing: The forewing in a natural position is roof-like, curving around the dorsum of the abdomen. In spread specimens the forewing varies in shape from narrowly to broadly triangular, subrectangular, and trapezoidal. Its length is usually

two to four times more than its width. The hindwings are relatively broader than the forewings, and are folded in a natural position (Brown, 1983; Kuznetsov, 1987). The termen varies in form, forming a right angle or strongly oblique relative to the costa. The termen may be more or less straight or variably sinuate beneath the apex. In some enarmoniine genera as *Ancylis* the apex is strongly projecting and followed by a deep notch. The forewing shape is sexually dimorphic in some genera, with the male having a costal fold, usually enclosing modified scales (Horak, 1999). The forewing scales are usually smoothly appressed, but raised scale tufts occur in several groups. The olethreutine hindwing usually has cubital pecten consisting of a row of hair scales on or behind the base of CuA (Horak, 1991). The hindwing is sometimes sexually dimorphic, usually with an expanded anal area in the male and often forming a fold or roll along the anal margin containing specialized scent-producing scales. The male hindwing of some species have very small and widely spaced scales in a semi-translucant wing, areas of melanic scales above and/or beneath, and scale pencils in diverse positions. The base of the hindwing has frenular bristles that fit into the retinaculum beneath the forewing. Females have three, rarely two, frenulum bristles, whereas males have a single composite one (Horak, 1999).

The forewing wing pattern is based on modifications of transverse fasciae, including dislocation, confluence, and disruption of these fasciae. The positions of these fasciae are determined by pairs of costal strigulae. These costal strigulae are vein dependent with one pair of strigulae between each pair of veins except four pairs are present between wing base and Sc and two pairs are present between Sc and R_1 (Fig. 2). The forewing venation includes an apically closed discal cell with the media stem (M-stem) and stem of R_4 and R_5 (chorda) well-developed. R_4 usually runs to costa and R_5 to the termen, but rarely R_5 ends at or before apex. R_4 and R_5 are stalked in several group, R_3 is approximate to R_4 but only rarely are the two veins stalked. Three median (M) branches and two branches of the cubitus anterior (CuA branch) are present. The cubitus posterior (CuP) is present near the wing margin, but never as a fully developed vein. Anal veins 1A and 2A are fused distally forming a basal loop (Horak, 1991, 1999) (Fig. 3). Five fasciae are defined by the strigulae, and these

include the basal, subbasal, median, postmedian and preterminal fasciae (Brown and Powell, 1991; Baixeras, 2002).

The hindwing venation includes subcosta is fused with the first radius branch ($Sc+R_1$), and the remaining radial veins are fused to form the radial sector (Rs). Three M branches and the two CuA branches arising from the discal cell and may be connate, stalk or even fuse. In some species R_5 and M_1 are closely approximate and parallel at base or are stalked. M_3 and CuA are stalked in Eucosmini whereas these two veins are widely separate in Grapholitini and approximate in other (Horak, 1991, 1999) (Fig. 3).

Abdomen: The olethreutine pregenital abdomen composed of eight segments in the male and seven segments in the female. The sternum of the first segment (S1) is lacking, and S2 is well developed into a pair of anterolateral process (Scoble, 1992). Razowski (1990) pointed out that two main types of scent organs in abdomen are present on the invaginated areas of segmental plates and pouches on the basal and ventral regions of the intersegment membrane. Various secondary sexual modifications of the pregenital abdomen are presented in olethreutine males (Brown, 1983; Razowski, 1990). Segment 8 in males often has variously modified scaling and coremata (Horak, 1999; Komai, 1999). A pair of lateral pouches on S2 is found in shallow folds in *Lobesia* and *Sycacantha* (Falkovitch, 1962). The genus *Grapholita* has a transverse patch of scales or a pair of scale-tufts on the anterior portion of tergum of segment 4-8, and *Parapammene* has a transverse patch of hair-like scales on tergum of T4 and T5. In *Cryptophlebia*, *Sorolopha* and *Andrioplecta*, a pair of scale-tufts arises from membranous, shallow pockets formed in the anterior corners T8 (Komai, 1999).

Male genitalia (Fig. 4): The uncus is bifid or single in the generalized taxa, and is reduced to completely absent in more derived taxa. The socii are a pair of setose lobe that are often reduced to small setose patches and are often small or entirely lost in Grapholitini (Horak, 1991; Komai, 1999). The gnathos is typically reduced in most Olethreutinae to a pair of lateral, weakly sclerotized bands. In some

species the gnathos is strongly sclerotized and has upcurved arms that are fused with the ventral wall of anal tube. The vinculum is always a more or less narrow band in the Olethreutinae. The juxta is fused with caulis and the anellus, which surrounds the aedeagus. The transtilla is completely atrophied. The olethreutine aedeagus is tube-shaped, and the membranous inner vesica frequently has fixed or deciduous cornuti. The valva are strongly sclerotized, varying in shape, with a large membranous portion on the base of inner surface that is termed the basal excavation. The valva is articulated with the vinculum and are connected on the dorsal margin by a costal process or costal hook. The distal part of valva forms a distinct cucullus and is often separated by a neck from the basal sacculus. Olethreutine valva is often characterized by prominent spines, single or in groups (Horak, 1991, 1999).

Female genitalia (Fig. 5): The olethreutine female is of Ditrysian type with a copulatory opening (ostium bursae) separate from the ovipore for oviposition (Horak, 1999). The ovipositor lobes, or papillae anales are broad, flattened, and usually densely setose. Rarely, the papillae anales are modified. The papillae anales and tergum 8 have paired, long processes, the apophyses anteriores and apophyses posteriores. The ostium bursae is located in the sternum 8, but several groups, is displaced anteriorly to an excavation of the hind margin of sternum 7 or within sternum 7. The ostium opening is normally surrounded by a plate, termed sterigma, that consists of the lamella postvaginalis and lamella antevaginalis in the posterior and anterior portions, respectively (Horak, 1991, 1999). A connection of sterigma to the base of apophyses anteriorly by a sclerotized band is absent in all olethreutine except the Microcorsini (Horak, 1991). The bursa copulatrix is usually differentiated into a ductus bursae and corpus bursae that generally has two signa, which may be reduced to one or completely lost. Diakonoff (1973) subdivided the South Asiatic Olethreutini on the basis of the signum shape. The ductus bursae always has a sclerotized ring (colliculum) anterior to the ostium. The ductus seminalis connects the ductus bursae with the oviduct and usually has a diverticulum (Horak, 1999).

Biological habits

Oviposition

Species of Olethreutinae usually have a single generation in a year, but some have two or more generations annually (Razowski, 1976). Ovipositional behavior differs in various taxa. Eggs may be laid singly or in clusters and deposited on the surface of the substrate or in crevices or inside the substrate.

Larval feeding habits and hosts range

Horak and Brown (1991) provided a review of the feeding habits of the tribes of Olethreutinae. Larvae of Gatesclarkeanini are monophagous leaf rollers on woody plants. Larvae of Endotheniini are monophagous feeders in seed heads, stems, and roots of a wide variety of herbaceous plants, especially Labiatae and Scrophulariaceae. Larvae of Bactrini bore in stems of Cyperaceae and Juncaceae. Holarctic species of Olethreutini feed primarily on hosts in Rosaceae, Ericaceae, Betulaceae and Salicaceae. Larvae of Holarctic Enarmoniini and larvae of generalized Eucosmini, e.g., *Epinotia,* are mostly leaf rollers or webbers on hosts in Fagaceae, Rosaseae, Betulaceae, Salicaceae and Ericaceae. Larvae of more derived Eucosmini are monophagous or oligophagous stem and root borers of Asteraceae, e.g., *Epiblema*, *Eucosma*, or stems and cones of Pinaceae, e.g., *Rhyacionia*, in the Holarctic Region (Brown, 1987; Horak and Brown, 1991). Larvae of most Grapholitini are monophagous feeders on fruits and apical shoots of Rosaceae, Pinaceae, Fabaceae, and Fagaceae, although larvae of *Dichrorampha* are root borers in Asteraceae. *Strophedra* are leaf-skeletonizers in Fagaceae, Leguminoceae and Butulaceae (Komai, 1999).

Pupation

Pupation normally occurs within the larval habitation, such as in a stem or root (Bradley *et. al.*, 1973). Larvae of many species drop from their feeding sites and

form cocoons in debris on the soil surface or in the soil, e.g. *Cydia molesta* (Busck). (Rothschild and Vicklers, 1991).

Pheromones

Most tortricid sex pheromones are chemicals produced by a gland located at the female abdominal tip that are involved in long-range attraction of males and precopulatory behavior. Males also produce sex pheromones that are produced in glands and disseminated by associated hair pencils, hair brushes, and other sex scales. Male pheromones are involved in courthship behavior (Roelofs and Brown, 1982).

Tortricid moths have been favorites of pheromone research (Arn, 1991), and a review of pheromones was produced. Sex pheromones have been characterized in more than 60 tortricid species. Known female sex pheromones of tortricids are all composed of primary aliphatic alcohols and their corresponding acetates and aldehydes. Most tortricid pheromones contain either 12 or 14 carbons in the principal chain, although some have a 14 carbon chain, most Olethreutinae have a 12 carbon chain (Roelofs and Brown, 1982). Komai (1999) summarized information on sex pheromone and sex attractants known for the tribe Grapholitini and all used 12-carbon compounds with unsaturation positions specific to the three genus groups.

Economic importance

Several species of Olethreutinae have been reported as economic pests of agriculture and forestry in many parts of the world. Dickler (1991) defined five groups of tortricids are commonly distinguished base on the nature of the injury they cause to fruit: fruit-boring, leaves rolling, bud-attacking, twig boring, and bark boring. The two major internal fruit feeders are *Cydia pomonella* (Linnaeus) and *Cydia molesta* (Busck) in the subfamily Olethreutinae, and these two species have spread around the world (Audemard, 1991; Barnes, 1991; Falcon and huber, 1991; Van Der Geest and Evenhuis, 1991; Vickers and Rothschild, 1991; Weires and Riedl, 1991). *C. pomonella* is the most widely distributed along with cultivated plant and in most

situations as key pest of apples, pears, and peach etc. *C. molesta* is recorded from a wide range of plant species in the family Rosaceae, mostly in the genera *Prunus* and *Pyrus* (Rothschild and Vickers, 1991). Van De Vrie (1991) also reported that *Prunus triloba* lindley is a host of *Enarmonia formosna* in Netherland. Other Rosaceae feeding pests are *Cydia packardi, Cydia prunivora, Hedya dimidioalba, Pseudexentera mali, Spilonota ocellana* (Weires and Riedl, 1991), and *Grapholita dimorpha* (Yan, 1999).

Roehrich and Boller (1991) reported that *Lobesia botrana*, the grape berry moths, attacks flower clusters and grapes of the grapevines. Tamaki (1991) showed *Cydia leucostoma* is known to attack tea in India and Indonesia. Seedling of cotton is damaged by *Crocidosema plebejana* and also *Cryptophlebia leucotoma* in Australia (Van Der Geest, *et. al.*, 1991). *Cydia hemidoxa* is the shoot borer of pepper and *Tetramoera schistaceana* is borer of sugarcane. Oku *et. al.* (1983) noted *Leguminivora glycinivorella* and *Matsumuraeses* species were found to damaged soybeans in Japan. *Heleanna melanoneura* larva feeds on the young leaves of mango in Taiwan and *Acroclita nigrovenana* spins the young leaves on litchi in Japan (Nasu, 1993, 1995), moreover Nasu *et. al.* (1993) reported that *Statherotis discana* larva injuries *Litchi chinensis* and *Nephelium lappaceum* by rolling the leaves.

Oku (1968) reported that about fourty species of Tortricidae have been known to occur in Japan as pest of coniferous tree such as *Retinia monopunctata, Cydia kamijoi* etc. Additionally, *Rhyacionia* and *Zeiraphera* species were found feeding on pine (Heinrich, 1928; Liu and Bai, 1981; Benz, 1991; Bogenschütz, 1991; Liu and Nasu,1993 a, 1993 b), *Retinia* species feeding on *Pinus* (Miller, 1977). *Epinotia cineracea* and *Epinotia densiuncaria* damaged *Picea abies* and *Picea jezoensis* respectively (Nasu, 1991) and *Epinotia cedricida* injuries to Cedar in France (Diakonoff, 1969). *Cydia pseudotsugae* induces bark-mine scars on the trunks of young Douglas-fir trees (Evans, 1969). *Pristerognatha fuligana* is stem-borers of the balsam in Japan (Oku, 1979 b). *Makivora hagiyai* feeds into the fruit of *Podocarpus macrophyllus* in Japan (Oku, 1979 a). The oriental larch bark moth, *Cydia laricicolana* is a serious pest of larch bark tree (Tateyama and Oku, 1967). Diakonoff

and Bradley (1976) found *Anathamna spermatophaga* larva feed in seed of *Toona sureni* (Meliaceae) in Papua New Guinea. *Proteoteras arizonae* and *P. aesculana* feed on *Acer negundo* in California (Powell, 1962). Trematerra and Huemer (1994) reported *Strophedra welrana* larvae feed on *Fagus* in Italy. *Eucoenogenes japonica* are borer in the shoot of *Rhus javanica* in spring and summer, and an aphid-gall feeder in autumm (Yoshiyasu, 1986).

Several species of Olethreutinae in Thailand have been reported as being economically important in agriculture (Kuroko and Lewvanich, 1993; Lewvanich, 2001). *Gatesclarkeana idia* Diakonoff feeds on leaves of *Nephelium lappaceum* L., *Dimorcarpus longan* Lour., *Mangifera indica* L. and *Garcinia mangostana* L. *Statherotis discana* (Felder & Rogenhofer) and *Statherotis leucaspis* (Meyrick) are leaf rollers on *Nephelium lappceum* L., *Litchi chinensis* Sonn. and *Dimorcarpus longan* Lour.. *Cryptophlebia ombrodelta* (Lower) bores in fruit of *Litchi chinensis* Sonn. and *Durio zibethinum* Murray. *Lobesia genialis* Meyrick feeds on flowers of *Dimorcarpus longan* Lour., *Mangifera indica* L., and *Garcinia mangostana* L. *Dudua aprobola* (Meyrick) is a leaf roller of *Litchi chinensis* Sonn., *Dimorcarpus longan* Lour., *Mangifera indica* L., and *Garcinia mangostana* L. Other Olethreutine are pests of forest and shade trees (Hutacharean and Tubtim, 1995). *Cryptophlebia lasindra* (Meyrick) bores in pods of *Rhizophora mucronata* Poir. and *Rhizophora apiculata* Blume. *Retinia khasiensis (*Miller), *R. salweenensis* Miller and *R. cristata* (Walsingham) bore in shoots and cones of *Pinus merkusii* Jungh. & De Vries and *Pinus kesiya* Royle. Ex Gordon. *Cryptophlebia illepida* (Butler) bores in pods of *Cassia fistula* Linn.

Knowledge of Olethreutinae in Southeast Asia and Thailand

The fauna of Olethreutinae in Southeast Asia is poorly known. Selected species of Olethreutinae occurring in Southeast Asia were described by Walsingham, Meyrick, Snellen, Walker, and a few other taxonomists during the 1800's and early 1900's (Diakonoff, 1973). Diakonoff's 1973 treatment of South Asiatic Olethreutini was the first and last treatment of any major tribe of Olethreutinae for this region, but

he did not treat the Eucosmini or Grapholitini, which include more species than Olethreutini worldwide. More recently Kuznetsov (1988, 1989, 1992, 1997 a, 1997 b, 2003) described 52 new species of Olethreutinae from Vietnam.

The fauna of Olethreutinae in Thailand also is poorly known. For example, of 430 species of Olethreutini treated for Southeast Asia by Diakonoff, only eight were mentioned as occurring in Thailand. New species of Olethreutinae occurring in Thailand were described by Diakonoff (1959 a, 1971,) and Miller (1977). As of 1987, only 20 species of Olethreutinae were known from Thailand (Kawabe, 1989).

The most significant effort to document Olethreutinae and other Lepidoptera in Thailand has been by the Japanese Lepidopterological Expedition of the University of Osaka Perfecture. This expedition was made by a group of lepidopterists for periods of two months each in 1981, 1983, 1985, and 1987. A large number of Olethreutinae in Thailand were collected during this expedition, and some of these have been described in the Microlepidoptera of Thailand publication series from the University of Osaka. Since 1987 Japanese workers have described 38 new species and reported 120 new records for Thailand (Kawabe, 1987, 1989, 1995; Bae, 1995; Komai, 1995; Moriuti and Komai, 1995).

MATERIALS AND METHODS

Survey area

Thong Pha Phum National Park located in Thong Pha Phum and Sangkhlaburi districts, Kanchanaburi province was selected as the survey area. The total area covers 1236.97 square-kilometers. The northern part is close to local villages, the southern part is close to Sai Yok National Park, Kanchanaburi Province, the eastern part is close to Khao Laem National Park, Kanchanaburi Province, and the western part is close to the Thailand-Myanmar border (Fig. 6). Due to the complex mountain area, its 150 km boundary with Myanmar, the floral and faunal diversity is high. Habitat types include hill evergreen forest, dry evergreen forest and mixed deciduous forest (Fig. 7). The elevation is between 100-1,249 meters above the sea level.

The weather in this area is a tropical climate, which is influenced by the south western monsoon in the rainy season and the north eastern monsoon in the winter. Seasons include summer from February to April, rainy from May to October, and winter from November to January. Maximum temperature is 33°C, minimum temperature is 8°C, average rain is 1,760 mm/year with the maximum of 2,016 mm in September, and average humidity is 85.67%.

Survey method

Collecting Sites were selected to maximize different habitat types in the Park, and a Magellen GPS 315 was used to record the position of each collecting site. Collections were made with a 20-watt blacklight that was operated with a 12-volt car battery. The light was suspended in front of a 2 m x 2.5 m white sheet that was pinned to a 20-30 m rope between two trees and about 2 m above ground. The bottom edge of the sheet was spread on the ground beneath the light. Blacklights were operated from 6:00 pm to 6:00 am on at least 145 nights during three years (2001-2004). On each collection night moths were collected from the sheet in small jars using potassium cyanide as a killing agent. After the moths stopped moving, they

were transferred to a larger killing jar with a layer of cotton on the bottom to prevent loss of scales during transportation. Collected specimens were placed in a relaxing box the following day after their collection so it would be easy to pin and set wings in the laboratory within a week of their collection. Large and medium sized moths were mounted on size 0 pins, and smaller moths were mounted with size 00 pins or minutens (size .20 mm). All specimens were set on spreading boards and dried in an oven at 35°C for at least one week. Specimens were maintained in the insect collection in the Department of Entomology at Kasetsart University.

Data management

All specimens were given a unique number, and their label data were entered into an Excel database. Specimens selected for genitalia and wing preparation were given a dissection number, and their data were entered into Excel and a separate genitalia logbook. The dissection numbers were placed on a label for the pinned specimens and written on the slide label.

Dissection and preparation of genitalia

Male and female specimens of each morphotype were selected for dissection. The abdomen was first removed from the specimen by pressing curved tip forceps against its underside. The abdomen was placed into a vial with 5 ml of 10% potassium hydroxide at room temperature overnight or longer to digest extraneous tissue. The softened abdomen was transferred to a watch-glass containing 20% ethyl alcohol. Most scales and abdomen contents were removed by using curved tip forceps and a camel's hairbrush (size 000). Specialized hair tufts and sex scales on the male abdomen and genitalia were retained. The abdomen and genitalia were stained in eosin for 5 minutes to give a red stain to sclerotized structures and then stained in chlorosol black for 5 minutes to give a black stain to membrane. After staining the abdomen and genitalia were transferred to 70% ethyl alcohol and separated with forceps. The male genitalia was separated as a unit from the end of the abdomen. The female genitalia was removed by cutting the membrane between the 6th and 7th segments and pulling the terminal segments free from the remainder of the abdomen

to expose the bursa copulatrix. Scales and extraneous tissue were removed from sclerotized portion of genitalia with forceps and camel's hair brush. The genitalia and abdomen were transferred to absolute ethyl alcohol and positioned under glass chips. The male valvae were spread with curved tip forcep while the glass chip was being placed on the top. The female was positioned to show the papillae anales and other structures on the ventral surface. The genitalia was hardened in absolute ethyl alcohol for 5-6 hours or overnight and mounted in Euparol on microscopic slides with round cover slips (22 mm diameter) added on top of the preparation.

Wing preparation

Wings of selected specimens were mounted on microscopic slides for examination of venation. The forewing and hindwing were removed carefully at their base with forceps from one side of the specimen, placed into 10% potassium hydroxide and kept in room temperature overnight. Each wing was transferred to 20% ethyl alcohol for removal of scales with a camel's hair brush. After staining with eosin overnight, the wings were dehydrated and positioned in absolute ethyl alcohol for a few hours. The slide mounting method for wings was similar to that for genitalia.

Examination of material

A Leica MZ 12.5 stereomicroscope with an ocular micrometer was used to examine and measure specimens. Characters that were used for differentiating species included those of male and female genitalia, wing pattern, sex scales of the male, and color and form of appendages of the head and thorax. A compound microscope was used for counting number of deciduous cornuti in the aedeagus and examining microtrichia and small structures of genitalia. The forewing length was measured from the outer edge of the tegula at wing base to the outermost edge of the fringe scales at apex and was given as an average of lengths for all measured specimens of each sex. Valval length was measured as a straight line from the ventral, proximal corner of the sacculus to the apex of the cucullus.

Drawing and photography

Drawings of genitalia and wing venation were made from slide-mounted specimens using a Leica MZ12.5 stereomicroscope and Leica MZ A7 drawing tube. Initial drawings were made with pencil, and final drawings were made on acetate drafting film with permanent ink. Pinned adult specimens were photographed with a Leica MZ 12.5 Steromicroscope with an Evolution MP Media Cybernetics In-line focusing system.

Analysis of results

Species were identified based on comparisons with published illustrations and descriptions and examination of types that are present in various museum. Generic assignments were determined based on published descriptions and additional consultation with Professor Richard L. Brown, Mississippi State University, Professor Furumi Komai, Osaka Prefecture of Art, and Japanese workers (University of Osaka Perfecture, Japan). New species and new record were described and illustrated according to rules of the International Commission of Zoological Nomenclature (1999). Terminology for wing venation and genitalic structures were based on Klots (1970); Horak (1984); and Horak and Brown (1991). Terminology for forewing patterns and strigulae were based on Brown and Powell (1991) and Brown (1992), as modified and discussed by Baixeras (2002). Colors were described with the standards of Kornerup and Wanscher (1983).

Presentation of results

Results were arranged by tribe based on phylogenetic relationship following Brown (2005), with the included genera in alphabetical order, and species in alphabetical order beneath the appropriate genus. Synonyms, subspecies, and misspellings are listed in order under the alphabetical taxon including author, year, reference, and type species, with the author and year of type species.

Descriptions of adult, head, antennae, mouthpart, thorax, wings, and male and/or female genitalia are shown respectively. Specimens examined and remarks were included in each species. Figure plates of adult, male genitalia, and female genitalia were separated, all were arranged by tribe based on phylogeny, included genera and species in alphabetical order. Measurements of wing length in adult plates were in millimeters while those of male and female genitalia including abdomen were shown with scale bar of =0.5 millimeters long.

Visitation of collection

Type specimens and additional materials collected by Japanese taxonomists and other taxonomists were examined at the Entomological Laboratory, College of Agriculture, University of Osaka Prefecture, Sakai, Osaka, Japan; Furumi Komai collection, Osaka Prefecture of Arts, Osaka, Japan and Systematic Entomology Laboratory, and Smithsonian Institution, National Museum of Natural History, Washington, DC, USA.

Type specimen deposition

Type Specimens were deposited in Systematic Entomology Laboratory, Smithsonian Institution, National Museum of Natural History, Washington, D.C., USA. Paratypes were deposited in Department of Entomology, Kasetsart University and Mississippi Entomological Museum.

RESULTS

TRIBE GATESCLARKEANINI

Gatesclarkeana Diakonoff, 1966

Gatesclarkeana Diakonoff, 1966, Zool. Verh. Leiden 85: 48. Type species: *Platypelpus erotias* Meyrick, 1905.

Gatesclarkeana has been defined by the following; medium-sized, broad-winged, brownish, often dark with leaden metallic streaks or spots, often with pinkish hue along costa, modified white abdominal scaling dorsally at base. *Gatesclarkeana* has pair of deep round concavities at base of tergum 2 in both sexes. The male is characterized by expanded hind tibia, with an additional scale pencil from its inner base. The anal region of the male usually modified, either by a dense lengthened fringe or with the anal lobe enlarged and with modified scaling beneath. Male of some species also have ventral scale filled pockets on the abdomen on sternum 3-5. The male genitalia is diagnostic for the genus with large pedunculi, a hairy, distally bilobed, membranous uncus, strongly asymmetrical valvae with a sclerotized sacculus giving raise to a valvula topped with blunt short spines and, on the right side only, to a sheaf of long spines enfolded between the down turned dorsal half and the ventral portion of the cucullus, a small juxta and long caulis. The female genitalia are equally unique with an asymmetrical, deeply invaginated sterigma posterior to sternum 7, consisting of a distally widening curved irregular cone with the posteriorly flattened and sclerotized ductus bursae, with one signum formed by a scobinate The genus includes 10 species worldwide and is most diverse in the oriental region. *Gatesclarkeana* includes 9 species that have been described from Southeast Asia and one species from Australian region (Brown, 2005). Diakonoff (1973) noted that numerous hosts of many plant families for *Gatesclarkeana idia* Diakonoff, with the larvae feeding on leaves, flowers and rarely fruit and several hosts of different families, with tea (Theaceae). *Gatesclarkeana* species seem to be polyphagous leaf rollers, sometime feeding as borers.

Gatesclarkeana idia Diakonoff, 1973

Figs. 8.1, 31.1, 31.2, 80.1

Gatesclarkeana idia Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 8. Type locality: Indonesia (West Java, Sindanglaja). Holotype (♂): RMNH.

Gatesclarkeana idea Kawabe, 1975, Trans. Lepid. Soc. Japan 28: 31. [misspelling of *idia*].

Description. *Head*: upper frons reddish brown and dark brown, lower frons yellowish white mixed with pinkish-white; labial pulpus with first segment orange white, second segment pale red to greyish red and brownish grey spot at base and mixed with greyish brown on apical half, apical segment brownish grey with greyish red apex; vertex red brown to greyish brown white basal 1/3 and dark brown, brownish yellow at tips of scales, reddish brown to greyish brown with small patch of short, orange white scales posterior to chaetosemeta, and row of brownish red scales posterior to eye.

Thorax: Pronotal collar greyish brown, tegulae dark brown mixed with variable amounts of greyish red basally, reddish brown apically, apical scales with orange white apices; mesonotum dark brown intermixed with reddish brown, with reddish brown posterior tufts. Forewing (Fig. 8.1): Length 6.41 mm in male (n=25), 6.65 mm in female (n=12); ground color and costal strigulae red to pinkish white, intermixed with brown and silvery striae; costal strigulae 1 and 2 represented by three spots at base, strigulae 3 and 4 paired and separated, strigulae 5 and 6 single and approximate, strigulae 7-9 paired; subbasal fascia distinct on costa between strigulae 2 and 3; basal patch dark brown, some scales with reddish brown species; median fascia distinct on costa between strigulae 4 and 5 extending to inner margin as diffuse, indistinct band of dark brown intermixed with red and reddish brown, fascial outer margin irregular, with small white spot at end of discal cell; postmedian fascia present as distinct dark brown spot surrounding by red between strigulae 6 and 7 to outer 1/4 of wing with dark brown fascia extending diagonally from near R_3 to M_3 at outer

margin, a narrow sinuated line of dark brown extending form near postmedian spot on costa to tornus, line broken by red in some specimens; a dark brown line extending from between strigulae 7 and 8 to outer margin between R_5 and M_1, silvery scales present as small spots in basal patch, a transverse, irregular band between basal patch and median fascia, a crescent-shaped band from near M_1 to tornus, a diagonal band from near strigulae 7 to M_2 on outer margin and a small spots adjacent to strigulae 8 and 9, outer marginal scales brown except for reddish brown terminal strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2, CuA_2 and CuP. Hindwing brown; male with inner anal margin folded ventrally, open near margin and exposing long, grey sex scales at margin adjacent to short, rounded sex scales.

Abdomen (Fig. 31.2): Sternum III swollen and covered with numerous transverse folds, posterior edge projecting slightly over sternum IV and conceals a large cavity opening, with dense large sclaes; sternum IV with oblique lateral fold, slightly curved and narrow pointed not reaching to the middle, finely wrinkled on surface; strernum V with suboval modified area along posteromedial edge, disconnnected medially, semicircular wrinkles at the sides.

Male genitalia (Fig. 31.1): Tegumen narrowed, widened basally, scaless; uncus rather broad, apex rounded, slightly constricted medially, densely setose; socii with large round lobe, arising from tegumen dorsolaterally, long half of tegumen length, densely setose; gnathos arising from basal 1/3 of tegumen, widened band-like, sclerotized; anellus surrounding basal 1/4 of aedeagus; aedeagus rather short, with one large and two small thorns on left edge; cornuti absent; valva asymmetrical, left valva with small sacculus, with dense setae along ventral margin, with large circular disc, with short, dense stout spines on dorsal surface; cucullus modeately long, broad, widened medially, densely setose throughout, especially apically, right valva larger than left, sacculus broad and round with sparse setae, dorsal with large lobe, moderately long, basal widened, apex rounded, with short, dense stout spines along dorsal margin towards apical half of lobe, cucullus large, broad, folded longitudinal half, densely setose, inside with very long, pointed spines, originating from base of cucullus.

Female genitalia (Fig. 80.1): Sternum VII densely scaled and microtrichiate, sparsely setose; tergum VIII without setae posteriorly, with dense scales on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; sterigma strongly sclerotized, long, asymmetrical, oblique rising, dilated towards ostium bursae at top, dense long trichia, anterior rim oblique, right side raised up, posterior rim lower than anterior rim, concaved medially, slightly dentate; lamella postvaginalis with large patch, slightly sclerotized, dense microtrichia; ductus bursae posterior 3/4 sclerotized; colliculum short and narrowed, ductus seminalis arising from near corpus bursae opening; corpus bursae with unequal signa, small signum forming small round plate, scobinated, larger signum with scobinated plate, with two short thorns.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 13 Mar 2002 (1♂, genitalia slide NP297, 1♀, genitalia slide NP296), 17 Apr 2002 (1♂, genitalia slide NP312), 28 Sep 2002 (1♀), 19 Jul 2003 (1♂), 24 Aug 2003 (5♂), 13 Sep 2002 (1♀), 19 Sep 2003 (1♂, 1♀), 20 Sep 2003 (1♂), 21 Sep 2003 (3♂), 14°31'52"N 98°37'58"E, 14 Mar 2002 (4♂, genitalia slide NP299, NP300, NP301, NP302), 14°32'21"N 98°37'17"E, 15 Mar 2002 (1♂, genitalia slide NP239, 1♀, genitalia slide NP238), 14°39'02"N 98°31'40"E, 17 Aug 2002 (1♂), 22 Aug 2002 (1♂), 17 Jul 2003 (1♀), 25 Oct 2003 (1♂), 22 Dec 2003 (1♂), 14°39'10"N 98°36'29"E, 3 Oct 2002 (2♀), 4 Oct 2002 (2♂, 2♀), 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♀), 14°41'43"N 98°27'34"E, 22 Nov 2003 (2♂).

Distribution. Thailand, Indonesia, India, South China, East Borneo, West Sumatra, West Java, West Bali, Moluccan Is. and Taland Is.

Remarks. Specimens were collected throughout the year at 180-945 m in mixed deciduous forest and hill evergreen forest.

TRIBE BACTRINI

Bactra Stephens

Bactra Stephens, 1834, Illust. Br. Ent., (Haustellata) 4: 124. Type species: *Tortrix plagana* Haworth, [1811].

Aphelia Stephens, 1829, Nom. Br. Insects: 47. Type species: *Tortrix plagana* Haworth, [1811]. [preoccupied].

Leptia Guenée, 1845, Annls. Soc. Ent. Fr. (2)3: 169. Type species: *Tortrix lancealana* Hübner, [1796-1799].

Chiloides Butler, 1881, Ann. Mag. Nat. Hist. (5)7: 392. Type species: *Chiloides straminea* Butler, 1881.

Noteraula Meyrick, 1892, Trans. New Zealand Inst. 24: 217. Type species: *Chilodes straminea* Meyrick, 1885.

Bracta Pierce & Metcalfe, 1922, Genitalia Group Tortricidae Lepid. Br. Is: 40. [misspelling of *Bactra*].

Nannobactra Diakonoff, 1956, Zool. Verh. Leiden 29: 52. Type species: *Bactra phaulopa* Meyrick, 1911. [subgenus of *Bactra*].

Spinobactra Diakonoff, 1963, Tijdschr. Ent. 106: 291. Type species: *Bactra spinosa* Diakonoff, 1963. [subgenus of *Bactra*].

Bactra has been defined by the following characters; small to medium size, narrow-winged, ochreous to grey-brown moths with a forewing with pointed apex, fine longitudinal striation and often a straight dark streak from base to apex. The male genitalia with spatulate uncus fringed with flat pegs, a valva deeply divided into a

large, roundish sacculus lobe usually with prominent spines and a cucullus of either triangular shape with thick spines along margin. The female genitalia with an often complex sterigma usually consisting of a semicircular, projecting ledge from lamella postvaginalis with the ostium in a deeply invaginated, often with a median split. The single signum, a small reticulate or scobinate plate (Diakonoff, 1956, 1962, 1964). The genus includes 100 species worldwide. *Bactra* includes 30 species that have been described from the Oriental region (Brown, 2005). Host records for *Bactra* to Cyperaceae, Juncaceae and Gramineae. *Bactra venosana* feeds on *Cyperus rotundus* L.

Bactra cerata (Meyrick), 1909

Figs. 8.2, 31.3

Polychrosis cerata Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 587. Type locality: Ceylon [Sri Lanka] (Diyatalawa). Lectotype (♂): BMNH.

Bactra cerata insularis Diakonoff, 1964, Zool. Verh. Lieden 70: 49. Type locality: Fiji Islands (Vunidawa, Reiva River). Holotype (♀): BMNH.

Description. *Head*: Lower frons white, upper frons white to orange white; labial palpus with first segment white, second segment light brown with orange white apically, apical segment orange white; vertex pale orange to greyish orange.

Thorax: Pronotal collar light brown; tegulae light brown mixed with greyish orange; mesonotum orange white to pale orange. Forewing (Fig. 8.2): Length 5.01 mm in male (n=1); male costal fold absent; termen rounded; ground color brown mixed with greyish brown; costal strigulae white to grey, strigulae 1-9 paired and separated by dark brown; basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin, distal margin medially extending outwardly to discal cell, greyish orange mixed with brown and light brown; median fascia distinct extending from costa to inner margin, separated by ground color at midwing present as large subquadrate spot on costa and on inner margin, greyish

orange; postmedian fascia suffused with ground color, preterminal fascia present as narrow dark brown strip extending diagonally from costa to outer margin at R_5; outer margin with distinct dark brown line, broken by strigulae, white to grey, between R_5 and M_1 and between M_1 and M_2. Underside light brown with grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Male genitalia (Fig. 31.3): Tegumen broad, widened apically, scaleless; uncus rather short, concave medially, apex round with dense compact spines projecting ventroposteriorly; socii short and wide, densely setose, pendant from base of uncus; gnathos arising from apically of tegumen, moderately sclerotized basally; anellus closely surrounding at base of aedeagus, ventral opening; aedeagus very long and curved, widened, apex with one large, acute spine; juxta triangular; vinculum U-shaped, with small quadrate lobe medially, projecting ventrally; sacculus thickened, with small group of short setae basally, outer margin with sparse to moderate dense short, acute spines, between ventrobasally to ventromedially, median with densely setose from basal opening to outer margin; neck indistinct; cucullus shorter than sacculus, densely setose, with large lobe basally, dense microtrichia, apex with row of spine.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°32'37"N 98°38'46"E, 23 Aug 2002 (1♂, genitalia slide NP397).

Distribution. Thailand, India, Sri Lanka, Lesser Sunda Is., Fiji, Palau Is. and New Guinea.

Remarks: Specimen was collected during the rainy season at 226 m in mixed deciduous forest.

Bactra coronata Diakonoff, 1950

Figs. 8.3, 31.4, 80.2

Bactra coronata Diakonoff, 1950, Bull. Br. Mus. (Nat. Hist.), Ent. 1(4): 286. Type locality: Indonesia (West Java, Bandong). Holotype (♂): BMNH.

Description. *Head*: Lower frons white to orange white, upper frons greyish orange; labial palpus with first segment orange white, second segment orange white mixed with light brown basally and transverse brown strip medially, apical segment light brown; vertex pale orange to greyish orange.

Thorax: Pronotal collar light brown with orange white apices; tegulae light brown mixed with brown basally; mesonotum greyish orange intermixed with light brown. Forewing (Fig. 8.3): Length 5.90 mm in male (n=4), 5.82 mm in female (n=5); male costal fold absent, termen straight; ground color orange white intermixed with brown striae, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal patch indistinct present as irregular longitudinal strip from wing base to near base of CuA_2, brown to dark brown; median fascia incompleted extending from costal to CuA_1 separated by ground color between R_3 and M_1, upper part present as narrow strip, brown mixed with dark brown, extending diagonally from costa to R_3, lower part present as large dark brown spot between M_1 and CuA_1, with small white spot at base of between R_5 and M_2; postmedian fascia and interfascia between strigulae 7 and 8 with brown striae extending diagonally to outer margin; ocellus region with spot, dark brown between M_3 and CuA_1, apical area with distinct dark brown strip extending along R_5 beyond median fascia to apex and on longitudinal veins from discal cell to outer margin, wing apex dark brown; outer margin with distinct dark brown striae, broken by strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing white with orange white on wing venation dorsally, ventral white except on costa light brown.

Male genitalia (Fig. 31.4): Tegumen with arms broad, scaleless; uncus rather short, round lobe, concave medially, with row of short, dense, stout spine at apex, apicoposteriorly with dense microtrichia; socii small, round lobe, densely setose, arising from base of uncus; gnathos arising from apical 1/3 of tegumen, sclerotized basally; anellus surrounding basal of aedeagus, basal opening; aedeagus widened, moderately long, curved medially, without cornuti; juxta large, widened; sacculus thickened, as long as cucullus, with group of short, small setae basally, ventrobasally to ventromedially with long, sparse spines, mixed with short, sparsely setose along outer margin, between ventrobasally to dorsobasally; dorsal with group of dense short setae inner margin; neck indistinct; cucullus broad, widened medially, sparsely setose, except outer margin, dense short spines and setae, apex rounded with dense setae.

Female genitalia (Fig. 80.2): Sternum VII densely scaled, sparse setae, medially forming large patch, heart-shaped, moderately sclerotized, with margin sclerotized folded beneath sternum VII plate, scaleless; tergum VIII densely setose posteriorly, with moderately dense scales on triangular lateral extensions, sparse setae; sternum VIII sclerotized plate, narrowed, scaleless; lamella postvaginalis and lamella antevaginalis reduced; ostium bursae beneath marginal folded of sternum VII medially; colliculum rather short; ductus bursae widened, enlarged to corpus bursae; ductus seminalis arising from near mid of ductus bursae; corpus bursae with one signum, cup like, dentate, with oval base, one edge sclerotized.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂, genitalia slide NP502, 1♀, genitalia slide NP734), 14°39'10"N 98°36'29"E, 3 Oct 2002 (3♂, genitalia slide NP498, NP503, NP513, 2♀, geniatlia slide NP733, NP735), 14°39'02"N 98°31'40"E, 17 Jul 2003 (1♀, genitalia slide NP634), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP719).

Distribution. Thailand, Philippine Is., Kangean Is., Java, Borneo and Sunda Is..

Remarks. Specimens were collected during the rainy season and the winter season at 180-742 m in mixed deciduous forest and hill evergreen forest.

Bactra honesta Meyrick, 1909

Figs. 31.5, 80.3

Bactra honesta Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 585. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 31.5): Tegumen broad, widened dorsally, scaleless; uncus rather short, widened medially, curved apically, with row of dense, stout spines on outer margin medially to apex; gnathos arising from midlength of tegumen, slightly sclerotized basally; anellus closely surrounding base of aedeagus; aedeagus rather short, moderately wide, without cornuti; juxta triangular; vinculum with dense scales medially; sacculus round-shaped, with group of short, dense setae basally, median with subtriangular lobe protuding posteriorly, densely short setose, with group of short, stout spine at apex; cucullus longer than sacculus, moderately long, broad, widened medially, rounded at apex; outer margin with dense short spines mixed with dense short setae outer marginal half.

Female genitalia (Fig. 80.3): Sternum VII with large, weakly sclerotized plate, densely scaled throughout; tergum VIII densely scaled posteriorly, triangular lateral extensions indistinct, anterior apophyses rotated basally; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae with margins sclerotized, anteriorly margin raised up medially, forming rounded lobe, smooth, posterior margin forming sclerotized ridge, narrowed, smooth, inside surface with moderately dense microtrichia, antrum forming a small, sclerotized cup; ductus bursae narrowed anteriorly half, posterior half widened; ductus seminalis arising from midlength of ductus bursae; corpus bursae with a small signum, forming scobinated plate.

Specimens examined. Thailand: Kanchanaburi prov..: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 9 Sep 2002 (2♂, genitalia slide NP496, NP725), 14°41'38"N 98°24'17"E, 30 Jul 2002 (1♀, genitalia slide NP738).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during the rainy season at 180 m in mixed deciduous forest.

Bactra orbiculi Diakonoff, 1956

Fig. 32.1

Bactra orbiculi Diakonoff, 1956, Zool. Verh. Leiden 29: 47. Type locality: East Borneo (Balikpapan, Mentawi River). Holotype (♂): RMNH.

Bactra orbiculi minax Diakonoff, 1964, Zool. Verh. Leiden 70: 53. Type locality: Philippine Is. (Luzon, Benquet Province, Klondyke). Holotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 32.1): Tegumen with arms broad, scaleless; uncus short, narrowed medially, apex with row of dense, stout spines, pointed downwardly; socii arising from base of cucullus, small lobe, densely setose; gnathos arising from dorsal 1/4 of tegumen, sclerotized basally, weakly sclerotized medially; anellus closely surrounding basal of aedeagus; aedeagus long, curved, cylindrical; cornuti absent; juxta triangular; valva thickened, sclerotized; sacculus with group of moderately dense setae basally, outer marginal area with sparse, short spines, except ventral angle with group of dense, short spines, median with large patch of dense setae, dorsal with large lobe, sparsely short setose, widened basally, with group of dense, moderately long spines, apically narrowed, apex rounded with row of dense, stout spines; cucullus large, slightly narrowed to rounded apex, sparsely setose, apical half with dense spines on outer marginal half.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP59).

Distribution. Thailand (new record), East Borneo, South Borneo and Philippine Is.

Remarks. Specimen was collected during the winter season at 250 m in hill evergreen forest.

Bactra venosana (Zeller), 1847

Figs. 8.4, 32.2, 80.4

Phoxopteris venosana Zeller, 1847, Isis von Oken (Leipzig) (10): 738. Type locality: Sicily (Syracuse). Holotype (♂): BMNH.

Bactra punctistrigana Mabille, 1900, Annls. Soc. Ent. Fr. 68 (1898): 751. Type locality: Madagascar (baie d' Antongil). Lectotype (♀): MNHN.

Bactra truculenta Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 586. Type locality: India (North Coorg, Dibidi). Lectotype (♂): BMNH.

Bactra scythropa Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 254. Type locality: Indonesia (Timor, Dilli). Holotype (♂): BMNH.

Bactra geraropa Meyrick, 1931, Exotic Microlepid. 4: 147. Type locality: Formosa [Taiwan] (Taihoku). Lectotype (♀): BMNH.

Bactra banosii Gozmány, 1960, Ann. Hist. Nat. Mus. Natn. Hung. 52: 416. Type locality: Egypt (Sohag). Holotype (♂): TMB.

Description. *Head*: Lower frons orange white, upper frons light brown mixed with dark brown; labial palpus with first segment light brown, second segment brown mixed with dark brown and orange white; apical segment light brown; vertex light brown mixed with brown.

Thorax: Pronotal collar light brown; tegulae light brown to brown intermixed with brownish orange; mesonotum greyish orange intermixed with light brown. Forewing (Fig. 8.4): Length 5.77 mm in male (n=1), 7.07 mm in female (n=3); male costal fold absent; termen straight; ground color orange white to pale orange mixed with diffuse dark brown transverse striae on inner margin; costal strigulae orange white, strigulae 1-9 paired except strigulae 3 two paired separated by dark brown; basal patch incompleted present as distinct irregular longitudinal strip, dark brown extending from wing base to near midwing, costal margin with distinct narrow dark brown strip extending diagonally; median fascia indistinct, on costa present as narrow line, dark brown extending diagonally outward to R_2, at base of M_1 and CuA_1 present as subtriangular spot dark brown mixed with small, white spot between R_5 and M_2, interfascia between strigulae 7 and 8 with dark brown striae extending from costa to outer margin at R_5, area between R_5 to tornus with distinct dark brown scales on longitudinal veins; outer margin with distinct dark brown striae, broken by pale orange strigulae between R_5 and M_1 and between M_1 and M_2; wing apex dark brown. Underside light brown with yellowish grey spots alternated with dark brown spots on costa, and yellowish grey spot on outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 32.2): Tegumen with arms broad, without setae or scales; uncus rather short, concave medially, rounded at apex, with row of dense, stout spines at apex; socii small, subtriangular, arising from base of uncus, densely setose; gnathos arising from dorsal 1/3 of tegumen, sclerotized basally; anellus surrounding basal of aedeagus, basal and lateral opening; aedeagus large, moderately long; cornuti absent; vinculum distinct, medially with triangular lobe, with various sizes of denticle, except ventromedial area; sacculus thickened, with small group of short setae basally, median with moderately dense strong spines, between near basal opening to ventromedially,

basal opening with group of short, dense setae from median to dorsal, dorsal with distinct three strong spines; neck indistinct; cucullus large, widened medially, rounded at apex, dense short spines outer margin to top mixed with moderately dense setae, except inner margin, sparse setae, cucullus basally with large lobe, narrowed basally, enlarged apically with row of dense stout spines at apex, area on outer margin between median to apical with short, sparse setae.

Female genitalia (Fig. 80.4): Sternum VII slightly sclerotized, densely scaled, sparse setae, with small sclerotized patch medially, with dense microtrichia, posterior margin sclerotized, folded beneath sternum VII posteriorly, forming sclerotized groove, extended to cover ostium bursae medially; tergum VIII densely setose on posterior margin, with moderately scaled on triangular lateral extensions; sternum VIII forming sclerotized plate, fused with tergum VIII, with dense microtrichia anterior half; lamella postvaginalis and lamella antevaginalis reduced; ostium bursa beneath sternum VII; colliculum short; ductus seminalis arising from near mid of ductus bursae; ductus bursae widened, enlarged to corpus bursae; corpus bursae with one, small signum, cup like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (1♂, genitalia slide NP334), 14°41'38"N 98°24'17"E, 30 Jul 2002 (2♀, genitalia slide NP374, NP469), 14°41'35"N 98°24'19"E, 2 Oct 2002 (1♀, genitalia slide NP488).

Distribution. Thailand, Silicy, India, Indonesia, Taiwan, Egypt, Madagascar, Southern Europe, Timor, South China, Philippine Is. and North Africa.

Remarks. Specimens were collected during the summer season and the rainy season at 195-990 m in mixed deciduous forest and hill evergreen forest.

Unplaced *Bactra*

Bactra sp. A

Fig. 32.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 32.3): Tegumen with arms broad, scaleless; uncus short, basal widened, pointed at apex, with row of moderately long, dense, stout spines from outer margin medially to apex; socii short, rather narrowed; densely setose; gnathos arising from dorsal 1/3 of aedeagus, sclerotized basally; anellus closely surrounding basal 1/5 of aedeagus, basal opening; aedeagus moderately long, widened; cornuti absent; juxta triangular; valva thickened; sacculus shorter than cucullus, circular plate-like, with group of short, dense setae basally, median with large, circular lobe, densely setose throughout posterior surface, mixed with short, moderately stout spine medially, outer margin of sacculus medially with long, sparsely setose; neck indistinct; cucullus subtriangular-shaped, moderately dense setae near outer margin, with group of short spine apical half and large, long spines basal half along outer margin, cucullus basally with large lobe, clavate, rounded apex, sparse short setae, apex with row of dense, stout setae at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂, genitalia slide NP495), 14°39'02"N 98°31'40"E, 29 Sep 2002 (2♂, genitalia slide NP728, NP729), 14°41'35"N 98°24'19"E, 2 Oct 2002 (1♂, genitalia slide NP492), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♂, genitalia slide NP671).

Remarks. Specimens were collected during the rainy season and the winter season at 180-956 m in mixed deciduous forest and hill evergreen forest.

Bactra sp. B

Fig. 80.5

Description. Wing pattern poorly defined.

Female genitalia (Fig. 80.5): Sternum VII moderately sclerotized, densely scaled, sparse setae; tergum VIII narrowed fused with sternum VIII forming narrow sclerotized ring, scaleless; membrane between sternum VII and sternum VIII folded, forming large groove ventrally; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis present as subtriangular lobe, dense microtrichia; lamella antevaginalis reduced; ostium bursae with smooth rim, very short colliculum; ductus seminalis arising from near midlength of ductus bursae; ductus bursae enlarged anterior half to corpus bursae; corpus bursae with one indistinct signum, forming small patch, slightly sclerotized.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 30 Jul 2002 (1♀, genitalia slide NP449), 14°40'03"N 98°36'07"E, 9 Sep 2002 (3♀, genitalia slide NP497, NP731, NP736), 14°41'43"N 98°27'34"E 19 Feb 2004 (1♀, genitalia slide NP720).

Remarks. Specimens were collected during the winter season and the rainy season at 180-990 m in mixed deciduous forest and hill evergreen forest.

Bubonoxena Diakonoff, 1968

Bubonoxena Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 65. Type Species: *Bubonoxena spirographa* Diakonoff, 1968.

Bubnoxena Razowski, 1977, Acta Zool. Cracov. 22: 222. [misspelling of *Bubonoxena*].

Bubonoxena has been defined by the following characters; medium-sized, usually with pale ochreous wings, with a dark brown triangular costal spot and a larger suffused dorsal spot opposite. Head with roughly appressed scales. Antenna in male slightly thickened, with labial palpus subascending, median segment moderately long slender anteriorly and strongly dilated posteriorly, terminal segment slender. Forewing elongate, narrow, apex subobtuse and termen gently round, chorda and median branch absent. In male genitalia, tegumen is weak, broad and obtusely triangular, with uncus absent. Gnathos with a weak band-like, valva triangular with broadly sacculus, with a produced and rounded top, crowned with a dense pencil of very long bristle, and a round large patch of short bristles in disc partly at the base of cucullus, cucullus narrow and obtuse, with short aedeagus. The female genitalia with much extended and corrugated sterigma, evenly short-haired, posterior edge with an excision with a row of bristles. Ostium small, cup-shaped, without signa (Diakonoff, 1967, 1973). The genus includes 5 speices worldwide and all have been described from Southeast Asia (Brown, 2005).

Bubunoxena ephippias (Meyrick), 1907

Fig. 33.1

Chrosis ephippias Meyrick, 1907, J. Bombay Nat. Hist. Soc. 17: 731. Type locality: Ceylon [Sri Lanka] (Puttalan/ Maskeliya) and India (Bombay). Syntypes: BMNH.

Description: Wing pattern poorly defined.

Male genitalia (Fig. 33.1): Tegumen moderately broad, with moderately long, dense setae along outer margin and dorsoposteriorly; uncus reduced; socii absent; gnathos arising from middle of tegumen, band-like, moderately sclerotized; anellus surrounding base of aedeagus, basal opening; aedeagus moderately long, enlarged basally, slightly taper to apex; cornuti absent; sacculus enlarged, thickened, scaleless with large round lobe ventromedially, bearing group of long, dense spiniform setae, dorsal with large patch, slightly concave medially, dense spines, outer margin of patch

with small triangular lobe ventrally; cucullus broad, dense long spiniform setae, with subtriangular large lobe basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°35'51"N 98°37'58"E, 23 Apr 2002 (1♂, genitalia slide NP355).

Distribution. Thailand, Philippine Is., India and Sri Lanka.

Remarks. Specimen was collected during the summer season at 500 m in dry evergreen forest.

Bubunoxena spirographa Diakonoff, 1968

Figs. 8.5, 33.2

Bubonoxena spirographa Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 66.

Type locality: Philippine Is. (Luzon, Mt. Makiling). Holotype (♂): USNM.

Description. *Head*: Lower frons orange white, upper frons pale orange; labial palpus with first segment orange white to pale orange, second segment orange white to pale orange mixed with light brown to dark brown medially, apical segment light brown mixed with dark brown dorsally; vertex orange white to pale orange.

Thorax: Pronotal collar dark brown mixed with brownish orange; tegulae orange white with light brown to dark brown basally; mesonotum with transverse strip, brown to dark brown alternating with orange white. Forewing (Fig. 8.5): Length 5.75 mm in male (n=4); male costal fold absent, termen straight, ground color white to orange white; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch present as irregular patch and striae, extending diagonally from costa between wing base and strigulae 3 to inner margin close to proximal margin of median fascia, light brown to brown mixed with dark brown; median fascia extending obliquely, irregular from costa between strigulae 4 and 5 to inner margin, brown mixed with dark brown, separated as dark brown strip by orange white scales;

postmedian fascia extending obliquely from costa between strigulae 6 and 7 to outer margin between M_2 and M_3, light brown mixed with dark brown; preterminal fascia extending obliquely from costa between strigulae 8 and 9 to outer margin at M_1; wing apex dark brown; ocellus region with irregular narrow striae, light brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Male genitalia (Fig. 33.2): Tegumen subtriangular, with arms broad, dorsally rounded, moderately dense scales laterally towards apex; uncus and socii rudimentary; gnathos arising from near base of tegumen, membranous; anellus closely surrounding basal 1/5 of aedeagus; aedeagus moderately long, curved medially; cornuti absent; juxta triangular; valva thickened, subtriangular, sacculus sparsely setose basally near basal opening, ventromedially with large, subtriangular lobe, apex acuted, pointed dorsally, asetose, basally with group of long, dense spiniform setae; cucullus subtriangular, slightly narrowed to rounded apex, sparsely setose, with dense setae on inner margin apically, basally with large group of dense spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 23 Dec 2001 (1♂, genitalia slide NP46), 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♂, genitalia slide NP574), 21 Dec 2003 (1♂, genitalia slide NP753), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP575).

Distribution. Thailand (new record) and Philippine Is.

Remarks. Specimens were collected during the winter season at 255-956 m in dry evergreen forest and hill evergreen forest.

Unplaced *Bubonoxena*

Bubonoxena sp. A

Figs. 8.6, 80.6

Description. *Head*: Lower frons and upper frons orange white; labial palpus with first segment orange white, second segment orange white to pale orange with diffuse dark brown scales medially, apical segment orange white with dark brown spot at apex; vertex light brown to brown mixed with orange white.

Thorax: Pronotal collar light brown; tegulae greyish orange mixed with light brown, with dark brown basally; mesonotum greyish orange mixed with light brown. Forewing (Fig. 8.6): Length 5.80 mm in female (n=2); termen straight; ground color orange white to pale orange; costal strigulae orange white, strigulae1-2 indistinct, strigulae 3-9 paired and separated by dark brown; basal patch present irregularly, brown mixed with dark brown, extending from wing base to strigulae 3 and from costa to inner margin; median and postmedian fascia fused, forming large patch extending irregularly from costa to inner margin, brown mixed with dark brown separated by ground color at discal cell area dorsally, between strigulae 7 and 8, 8 and 9 with dark brown spot on costa and light brown striae extending obliquely from costa to outer margin at R_5; outer margin with obliquely brown band, cresent-shaped extending from R_5 to outer margin at CuA_1, and terminal strigulae between R_5 and M_1, M_1 and M_2; ocellus region with diffuse patch, greyish orange to light brown; wing apex brown to dark brown. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally

Female genitalia (Fig. 80.6): Sternum VII moderately sclerotized, densely scaled, sparse setae; tergum VIII large, with sparse denticles anterior half, triangular lateral extensions without scales or setae; papillae anales moderately setose, lateral setae with papillose base; sterigma forming sclerotized plate, with dense trichia throughout, larger anterior 2/3; lamella antevaginalis forming sclerotized transverse band, with sparse long setae along posterior margin; ostium with anterior margin concave medially, dense microtrichia, posterior margin smooth; antrum sclerotized, cup-shaped; colliculum moderately long, encircling ductus bursae posteriorly; ductus seminalis arising from anterior 1/3; ductus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♀, genitalia slide NP458), 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP386).

Remarks. Specimens were collected during the rainy season at 180-220 m in mixed deciduous forest.

Bubonoxena sp. B

Fig. 81.1

Description. Wing pattern poorly defined.

Female genitalia (Fig. 81.1): Sternum VII densely scaled, sparsely setose, with dense microtrichia throughout; tergum VIII sparsely setose posterior margin, with four distinct trichiate anterior half, without scales or setae on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; sterigma forming large patch, dense and long trichia, medially with large tubular lobe protuded, round at apex, projecting posteriorly, curved, densely and long trichiate; lamella antevaginalis fused with lamella postvaginalis, deeply concave laterally, with long, sparse setae along lateral margin, lamella postvaginalis slightly sclerotized, lamella antevaginalis dense microtrichia, with two oblique strongly ridges, sclerotized, anteromedially with small round lobe touching ostium bursae; ostium bursae with dense microtrichia on anterior marginal half; colliculum long posterior 1/3 of ductus bursae; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 14 Jul 2003 (1♀, genitalia slide NP573).

Remarks. Specimen was collected during the rainy season at 1,015 m in hill evergreen forest.

Syntozyga Lower, 1901

Syntozyga Lower, 1901, Trans. R. Soc. S. Austral. 25: 70 Type species: *Syntozyga psammetalla* Lower, 1901.

Eleuthodema Bradley, 1957, Nat. Hist. Rennell Island, Brit. Solomon Is. 2(19): 95. Type species: *Polychrosis pedias* Meyrick, 1920.

Syntozyga has been defined by the following characters; small to medium-sized moth, intricately marked with reddish or greyish brown, usually with an indistinct dark blotch, outwardly oblique bar or complete transverse fascia on costa just beyond middle, with a curved brownish line from 2/3 of costa to termen above tornus. *Syntozyga* has moderately long , slightly sinuate and porrect labial palpi, with the second segment distally widened. The M-stem is absent and chorda from between R_1 and R_2 or R_2 and R_3. The genus has no secondary sexual modification scales. The male genitalia without uncus and dorsally connected socii. Valva with a large basal portion with tufts of long bristles or spines and thorns on the sacculus and/or distally to basal excavation are diagnostic to the genus. The female genitalia are characterized by a very diverse sterigma, often with a median lip with a row of marginal bristles laterally or with a raised strongly spinulose lamella antevaginalis. *Syntozyga* has no signum (Diakonoff, 1973). The genus includes only 7 species worldwide and 4 species has been described from the Oriental region (Brown, 2005).

Syntozyga pedias (Meyrick), 1920

Figs. 8.7, 33.3

Polychrosis pedias Meyrick, 1920, Exotic Microlepid. 2: 347. Type locality: India (Bengal, Chapra). Holotype (♀): BMNH.

Eucosma familiaris Meyrick, 1921, Zool. Meded. 6: 153. Type locality: Indonesia (Java, Pekalongan, Tegal). Syntypes (4): RMHN.

Description. *Head*: Lower frons white to orange white, upper frons pale orange; labial palpus with first segment orange white, second segment greyish orange intermixed with brown and dark brown, apical segment orange white with brown spot medially; vertex greyish orange mixed with light brown laterally.

Thorax: Pronotal collar brown to dark brown; tegulae greyish orange intermixed with brown and dark brown; mesonotum orange white mixed with brown and dark brown. Forewing (Fig. 8.7): Length 4.76 mm in male (n=2); male costal fold absent; termen rounded, ground color white to orange white, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, distal margin curved outwardly, dark brown intermixed with diffuse brownish orange; median fascia incompleted extending form costa to inner margin separated by ground color as strip at midwing, upper part dark brown, lower part brown to dark brown intermixed with brownish orange, with proximal margin extending suffused with interfascia in area of strigulae 3 and 4 at between 1A+2A and inner margin, strigulae 5 and 6 with grey striae extending from costa to inner margin beyond median fascia; pretornal sub triangular spot indistinct, dark brown, postmedian fascia extending diagonally from costa to outer margin at between CuA_1 and CuA_2, strigulae 7 and 8 with grey striae extending from costa to outer margin; ocellus region with irregular transverse narrow striae, dark brown between M_2 and tornus. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, ventral light brown.

Male genitalia (Fig. 33.3): Tegumen with arms moderately broad, slightly narrowed medially, slightly constricted dorsomedially, with densely scaled dorsal 1/3; uncus and socii absent; gnathos arising from midlength of tegumen, narrowed band-like, sclerotized; anellus surrounding base of aedeagus, basal opening; aedeagus rather short, moderately wide, without cornuti; juxta subtrapezoidal-shaped; sacculus very broad, cup-shaped, basal opening with thickened margin, sclerotized, with sparse setae basally, median with sclerotized lobe, concaved medially, dense spiniform setae along margin, with sparsely setose on outer surface, dorsal with group of long spiniform setae mixed with moderately short, dense setae; neck indistinct; cucullus smaller than

sacculus, slender, slightly narrowed to top, rounded apex, sparsely setose on outer margin, with dense setae on inner margin to apex, basally with small group of moderately long dense spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 30 Sep 2002 (1♂, genitalia slide NP505), 14°41'38"N 98°24'17"E, 15 Jul 2003 (1♂, genitalia slide NP621).

Distribution. Thailand (new record), India and Indonesia.

Remarks. Specimens were collected during the rainy season at 195-990 m in mixed deciduous forest and hill evergreen forest.

TRIBE OLETHREUTINI

Apsidophora Diakonoff, 1973

Apsidophora Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 329. Type species: *Apsidophora purpurorbis*, Diakonoff, 1973.

Apsidophora has been defined by the following characters; a broad uncus and enlarged socii, the male possesses an elaborate dorso-tibial scent organ, extending over tornus. Head with appressed scales, with moderately thickened antenna in male, short ciliate, labial palpi moderate, curved, subascending. Posterior tibia smooth-scaled outwardly, with long, appressed hair-scales above, inner side concave, with a thick pencil from base above. Forewing oblong, rather broad, costa little curved anteriorly, apex subrectangular, termen straight and vertical above. Hindwing modified in male, triangular and pointed, with a prominent tornus, dorsum rolled, filled with modified scales, a slender lanceolate lobe from base reaching top of tornus. Male genitalia with high tegumen, uncus hooked, clavate, socii large, a semicircular prominent lobe, densely haired. Gnathos ill-defined, tuba analis large and membranous. Valva long and slender, sacculus with marginal patch, two

supramarginal patch of spines. Cucullus bristles forming robust spines, with aedeagus rather long. The female genitalia with a moderate quadrate sterigma, with slightly extended up angle, reticulated, ostium with two oblique small ridges. Colliculum slender and rather short. Signa unequal, large signum clavate, with flattened oval base, small signum oblong, sclerite with one edge dark and thickened (Diakonoff, 1973) The genus includes only one species worldwide and has been described from Southeast Asia (Brown, 2005).

Apsidophora purpurorbis Diakonoff, 1973

Figs. 8.8, 81.2

Apsidophora purpurorbis Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 330.

Type locality: Indonesia (West Celebes, Sulawesi, Lindoe Paloe). Holotype (♂): BMNH.

Description. *Head*: Upper frons brownish orange to light brown, lower frons orange white; labial palpus with first segment orange white, second segment brownish orange to greyish brown, with greyish red strip medially and apically, apical segment light brown mixed greyish red; vertex brownish orange.

Thorax: Pronotal collar brown with greyish orange apices; tegula brownish orange with greyish basal 1/4; mesonotum greyish orange mixed with greyish red, separated by transverse strip medially, light brown to brown. Forewing (Fig. 8.8): Length 8.67 mm in female (n=1); termen straight; ground color white to orange white with diffuse transverse striae, pale orange to greyish orange, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; fascia present as dark brown on costa, apical half of wing with large patch, dark brown cresent-shaped, upper margin of patch extending from mid of 1A+2A curved to R_3 and extending to M_3, lower margin of patch extending from mid of 1A+2A curved outward to outer margin between M_3 and CuA_1. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 81.2): Sternum VII densely scaled, sparsely setose; tergum VIII moderately dense scales on triangular lateral extensions, with sparse setae; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis fused with lamella antevaginalis present as large patch, subquadrate plate, with slightly extended posterolateral corners, slightly concave posterior margin, reticulated throughout, with an aciculate vertical split-like ostium bursae, with two oblique ridges posteriorly; colliculum moderately long and narrowed 1/3 of ductus bursae; ductus seminalis indistinct; corpus busae with two unequal signa, cup-like, flattened oval bases, with one edge thickened than the other, large signum with distinct sharpless serrate on margins.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'16"N 98°23'57"E, 22 Dec 2001 (1♀, genitalia slide NP33).

Distribution. Thailand, Malay Peninsula, Sumatra, Celebes and New Guinea.

Remarks. This species was collected during the dry winter season at 900 m in hill evergreen forest.

Arcesis Diakonoff, 1983

Arcesis Diakonoff, 1983, Zool. Verh. Leiden 204: 49. Type species: *Arcesis anax* Diakonoff, 1983.

The genus includes 2 species worldwide that all have been described from the Oriental region (Brown, 2005).

Arcesis anax Diakonoff, 1983

Figs. 9.1, 34.1

Arcesis anax Diakonoff, 1983, Zool. Verh. Leiden 204: 50. Type locality: Indonesia (Sumatra, Mt. Bandahara, Bivouac Three). Holotype (♂): RMNH.

Description. *Head*: Lower frons yellowish white, upper frons orange white with dark brown apices; libial palpus with first segment brown to dark brown, second segment yellowish white mixed with light brown and brown, apical segment brown; vertex dark brown mixed with greyish yellow.

Thorax: Pronotal collar light brown mixed with brown; tegulae light brown mixed with brown; mesonotum brown. Forewing (Fig. 9.1): Length 11.13 mm in male (n=1); male costal fold absent; termen round; ground color yellowish white; costal strigulae 1-4 indistinct, strigulae 5-9 paired and separated by dark brown; basal, subbasal and median fascia indistinct suffused with large, irregular patch on costal margin half, extending from wing base to postmedian fascia, brown; postmedian fascia extending from costa to inner margin, brown; tornus with subtriangular patch dark brown intermixed with greyish yellow extending from tornus to R_5; wing apex with incomplete large patch extending from costa at between strigulae 7 and 8 curve to outer margin at CuA_1, with distinct curve on proximal margin, light brown to brown, with distinct, large, dark brown spot between R_4 and M_1 near wing apex; wing apex with irregular patch, metallic brownish grey; outer margin without terminal strigulae. Underside light brown with yellowish grey spots on costa between veins. Hindwing light brown to brown dorsally, inner margin with dense yellowish white scales. Hindtibia with dense white scales inner side, with dense hair pencil medially, yellowish white extending along tibia length.

Male genitalia (Fig. 34.1): Tegumen with arms, broaded, apical half densely setose laterally; uncus reduced fused with tegumen, forming rounded lobe; socii arising from tegumen apicolaterally, long, pendant to apical 1/3 of tegumen length, densely long setose, each with apex flattened, small, round-shaped; gnathos arising from midlength of tegumen, completed band-like, sclerotized; anellus cup-like, surrounding basal of aedeagus; aedaegus short, widened; cornuti absent; sacculus with group of long, dense setae basally to ventromedially, medain with large group of dense, long spiniform setae between basal opening and neck, dorsal moderately dense setae towards cucullus; neck distinct, rather short, concaved ventrally, sparsely spiniform setose; cucullus large, dense setae and spiniform setae, slightly incised

apicomedially forming two lobes, dorsal lobe rounded at apex, ventral lobe smaller, subtriangular, with single spine at apex, pointed ventrally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂, genitalia slide NP591).

Distribution. Thailand (new record) and Indonesia.

Remarks. Specimens were collected during the dry winter season at 180 m in mixed deciduous forest.

Archilobesia Diakonoff, 1966

Archilobesia Diakonoff, 1966, Zool. Verh. Leiden 85: 45. Type species: *Argyroploce drymoptila* Lower, 1920.

Enveryucelia Koçak, 1981, Priamus 1: 118. [replacement name of *Lobophora*].

Lobophora Turner, 1946, Trans. R. Soc. S. Austral. 70: 214. Type species: *Lobophora axiologa* Turner, 1946. [preoccupied].

Archilobesia has been defined by the following characters; small to medium-sized brownish moths with porrect, sinuate and broad labial palpi and with complicated wing pattern. Males with narrow forewing, conspicuously modified hindwing with deeply concave termen and dorsum, and with slender hind tibia with a long hairpencil. In the male hindwing 3A is widely distant from the anal margin and never partly covered by the folded margin. The male genitalia of all species are similar and diagnostic for the genus with a roof-shaped, ventrally bristled apex to the uncus, flat drooping socii-lobes, the gnathos a membranous transverse with spinulose lateral portions and a spinulose ventral hump, the valva with very long, slender and nearly parallel-sided cucullus, with a small triangular blade-shaped sacculus and a raised distal margin of the basal excavation. The female genitalia with their simple

short funnel-shaped sterigma divided into two lateral lobes and two thorn-shaped signa each in a circle of sclerotized granulation (Diakonoff, 1966). The genus includes 3 species worldwide that 2 species have been described from the Southeast Asia (Brown, 2005).

Unplaced *Archilobesia*

Archilobesia sp. A

Figs. 9.2, 34.2

Description. *Head*: Lower frons white; upper frons greyish orange; labial palpus with first segment white, second segment white to orange white basal half with dark brown spot dorsobasally, apical half light brown mixed with dark brown, apical segment light brown with orange white at apex; vertex greyish orange mixed with brown.

Thorax: Pronotal collar greyish orange; tegulae greyish mixed with light brown and brown; mesonotum greyish orange mixed with dark brown, posterior scales tuft brownish orange mixed dark brown basally. Forewing (Fig. 9.2): Length 7.91 mm in male (n=3); male costal fold absent; termen slightly concaved between R_5 and M_2, ground color orange white mixed with orange grey; costal strigulae white, strigulae 1-7 paired and separated by dark brown, strigulae 8-9 singled, basal patch extending form wing base to strigulae 3 incompleted, with dark brown spot on costal margin, irregular strip of brown scales on R vein, and subtriangular, large brown mixed with dark brown spot on inner margin, area between inner margin and midwing suffused by ground color; median fascia suffused with postmedian fascia and preterminal fascia present as subtriangular large spot, light brown mixed with dark brown, strigulae 5-7 with grey striae; ocellus region with three short, longitudinal lines, brown between M_2 and CuA_2 and silvery patch between tornus and M_3; outer margin with distinct dark brown striae, broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventrally light brown.

Male genitalia (Fig. 34.2): Tegumen high, with arms moderately broad, densely scaled laterally; uncus moderately long, curved, basal half widened, apicolaterally constricted, densely setose, dilated apically, apex truncated, densely setose ventrally; socii broad, rounded lobe, pendant from base of uncus to apical 1/4 of tegumen length, densely setose; gnathos arising from midlength of tegumen, completed band-like, narrowed, with anal tube medially; anellus surrounding basal of aedaegus, basal opening; aedeagus short, moderately wide; cornuti absent; valva long and slender; sacculus with group of moderately dense and long setae basally, ventromedially with group of dense, long setae, median with small group of moderately dense, short setae, dorsal with group of dense, moderately long, stout spines, extending oblique to cucullus ventrobasally; neck deeply concaved, sparsely setose; cucullus long, pointed at apex, densely setose, ventral margin with dense spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP72), 14°40'03"N 98°36'07"E, 22 Oct 2003 (2♂, genitalia slide NP676).

Remarks. Specimens were collected during late of rainy seanson to winter season at 180-380 m in hill evergreen forest and mixed deciduous forests.

Argyroptocha Diakonoff, 1968

Argyroptocha Diakonoff, 1968, Bull. U.S. Natl. Mus. 257 (1967): 70. Type species: *Argyroptocha phalaenopa* Diakonoff, 1968.

Argyroptocha has been defined by the following characters; elongate-winged, termen sinuate. Head with dense, appressed scales forming a short roughish, antenna pubescent in male, labial palpus moderate, porrected, slightly curved upward, with terminal segment very short, concealed. The male genitalia with large and high tegumen, uncus broad, quadrate, not clearly separated, densely haired on top. Socii probably represented by a row of bristles on each side, gnathos indefined. Valva

slender, moderately sclerotized throughout. Sacculus 1/2 ending in a triangular patch of bristles, cucullus hairy, narrowed, curved inwardly, bifurcated at top, upper hook with a short tooth, long anellus, with aedeagus straight and broad, with a sheaf of thin-spined cornuti (Diakonoff, 1967). The genus includes only one species worldwide that has been described from Southeast Asia (Brown, 2005).

Argyroptocha phalaenopa Diakonoff, 1968

Figs. 9.3, 34.3, 81.3

Argyroptocha phalaenopa Diakonoff, 1968, Bull. U.S. Nat. Mus. 257(1967): 70.

Type locality: Philippine Is. (Luzon, Mt. Makiling). Holotype (♂): USNM.

Description. *Head*: Lower frons greyish orange, upper frons brown intermixed with light brown; labial palpus with first segment white, second segment greyish orange suffused with light brown; apical segment brown; vertex greyish orange.

Thorax: Pronotal collar brownish orange to light brown; tegulae light brown; mesonotum light brown. Forewing (Fig. 9.3): Length 9.08 mm in male (n=11), 10.36 mm in female (n=2), termen slightly concaved between R_5 and M_3; male costal fold absent, ground color orange white to pale orange; costal strigulae orange white, strigulae 1-9 paired and separated by dark brown, fasciae absent, strigulae 4-8 with striae extending diagonally from costa to R, strigulae 5 with distinct grey striae extending from costa to outer margin, area between wing base to discal cell end with broken and irregular dark brown strips, inner margin with dark brown small patch near wing base, area between discal cell and outer margin with distinct longitudinal narrow line, dark brown between R_5 to CuA_1, pretenal spot indistinct present as irregular brown mixed with dark brown scales, ocellar region with two rounded spots, dark brown near outer margin between M_2 and M_3 and between M_3 and CuA_1, with silvery scales small patch beyond spots to outer margin. Underside light brown with yellowish grey spots on costa. Hindwing light brown dorsally, light brown ventrally.

Male genitalia (Fig. 34.3): Tegumen with arms moderately broad, dorsal 1/3 widened, densely scaled dorsoposteriorly, dorsoapical margin slightly concave medially; uncus reduced; socii reduced to short lobes broadly connected with tegumen dorsolaterally, covered with dense long setae; gnathos indistinct; anellus closely surrounding base of aedeagus; caulis long; aedeagus moderately long, large, widened medially, apical half narrowed, ventromedially with large patch of dense microtrichia, cornuti dense, long half the length of aedeagus; sacculus with group of long, dense spiniform setae ventromedially; neck moderately long, slightly concave ventrally; cucullus very small, moderately incised apicomedially with dorsal portion forming a long rounded lobe, covered with dense, long, spiniform setae, apex with short, stout spine, ventral portion forming a long, rounded, foot-shaped lobe, asetose.

Female genitalia (Fig. 81.3): Sternum VII moderately sclerotized, concave medially, densely scaled, sparsely setose; tergum VIII and triangular lateral extensions without scales or setae; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis and lamella antevaginalis reduced; ostium bursae covered by sternum VII, antrum forming a wide, sclerotized cup; ductus bursae with posterior half membranous, anterior half slightly sclerotized; ductus seminalis arising from near middle of ductus bursae between membranous and sclerotized areas; corpus bursae with signum forming irregular projection with large and small dentations, a sclerotized plate present near anterior end of ductus bursae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP71), 14°41'17"N 98°24'02"E, 9 Jan 2002 (2♂, genitalia slide NP138), 14°41'33"N 98°24'08"E, 11 Jan 2002 (2♂, genitalia slide NP66, NP103), 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♀, genitalia slide NP 110), 14°41'41"N 98°24'12"E, 6 Feb 2002 (4♂, genitalia slide NP181, NP184, 1♀, genitalia slide NP185), 14°41'40"N 98°24'15"E, 6 Feb 2002 (1♂, genitalia slide NP235), 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂).

Distribution. Thailand (new record) and Philippine Is.

Remarks. Specimens were collected during the dry winter season at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Balbidomaga Diakonoff, 1983

Balbidomaga Diakonoff, 1983, Zool. Verh. Leiden 204: 64. Type species: *Balbidomaga dorophora* Diakonoff, 1983.

Balbidomaga has been defined by the following characters; small to medium-sized greyish ocherous moths with a projecting red-brown apex followed by white scales enchancing the impression of a strongly sinuate termen, and often with a small, dark, triangular mark on the middle of costa. Male are characterized by a fake of costal fold, a semicircular flap of large, glossy scales at 1/5 costa covering a pencil of hairscales, and by a narrow anal vein with a band of long, modified scales between anal margin and 1A+2A. The male genitalia is characterized a large, capitate uncus and a well sclerotized, large and complex gnathos, valva with a blade-shaped process on ventral margin, with long band-like scales laterally on the basal half of tegumen, small socii, single row of very large bristles on the sacculus. The female are characterized by a spinulose sterigma usually sitting in a deep, often key-hole shaped emargination of sternum 7, entirely membranous ductus bursae (Diakonoff, 1983). The genus includes only one species worldwide that has been described from Southeast Asia (Brown, 2005).

Unplaced *Balbidomaga*

Balbidomaga sp. A

Figs. 9.4, 34.4

Description. *Head*: Lower frons white to yellowish white, upper frons yellowish white mixed with light brown; labial palpus with first segment light brown, second segment light brown mixed with brown to dark brown apically, with light

orange patch apically, apical segment light brown with yellowish white apices; vertex light brown.

Thorax: Pronotal collar greyish orange mixed with light brown; tegulae yellowish grey mixed with greyish yellow; mesonotum greyish yellow mixed with dark brown. Forewing (Fig. 9.4): Length 4.26 mm in male (n=1); male costal fold present extending from wing base to near mid wing and from costa to R vein; costal margin slightly convex on costal fold area; termen concave between wing apex and M_3; ground color yellowish white to orange white intermixed with sparsely dark brown spots; costal strigulae yellowish grey, strigulae 1-4 indistinct, strigulae 5-6 and 8-9 single, strigulae 7 paired and separated by dark brown; costal fold area yellowish grey mixed with yellowish white, basal and subbasal fascia indistinct present as irregular dark brown patch on inner margin basal 1/3, extending from inner margin to midwing; median fascia distinct on costa present as small dark brown patch extending from costa to R_1, with brownish orange narrow strip extending obliquely beyond patch to R_5 near outer margin; postmedian fascia present as dark brown spot on costa and extending oblique from costa to outer margin at between R_5 and M_1, brownish grey; wing apex brownish orange; ocellus region with irregular dark brown patch between R_5 and tornus; outer margin with yellowish white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown except costal fold area, dark brown, with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 34.4): Tegumen with arms, broaded, densely scaled basolaterally, apicoanterior surface with dense scales; uncus rather short, with apex bifided, pointed at apex, medially with lobe extending posteriorly, with dense spiniform setae laterally; socii small, arising from base of uncus, densely setose apically; gnathos arising from apical 1/3 of tegumen, forming large, sclerotized, subtriangular plate, extending and connected ventrally near aedeagus; anellus surrounding basal of aedeagus; aedeagus moderately long, narrowed to apex; cornuti absent; sacculus with group of moderately setae basally; median sparsely setose near ventromedial margin; neck indistinct; cucullus large, rounded at apex, with dense

spines along near ventral margin, and extending to near dorsobasal margin, ventro basal margin forming moderately long, subrectangular lobe, sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP 533).

Remarks. Specimens were collected during the summer season at 745 m in hill evergreen forest.

Cymolomia Lederer, 1859

Cymolomia Lederer, 1859, Wien. Ent. Monatschr. 3: 374. Type species: *Phalaena hartigiana* Ratzeburg, 1840.

Cymolomia has been defined by the following characters; head with appressed scales, roughly on vertex. Antenna minutely ciliate in male, labial palpi subascending, moderately curved, dilated posteriorly, terminal segment short, subobtuse. Posterior tibia with dense closely appressed long hair-scales above, a long pencil from base, partly concealed. Hindwing with edge of dorsum downcurved roll, projecting posteriorly in a small point lobe. The male geniatlia with uncus rather short, bilobed and hooked, socii moderately broad, pending. Gnathos membranous or absent. Valva long and slender, sinuate, sacculus little dilated, cucullus simple. Aedeagus moderate, narrowed. The genus includes 6 species worldwide. *Cymolomia* includes 3 species has been described from Southeast Asia (Brown, 2005). *Schima noronhae* (Theaceae) is host plant of *C. phaeopelta* (Diakonoff, 1973).

Cymolomia phaeopelta (Meyrick), 1921

Figs. 9.5, 35.1

Argyroploce phaeopelta Meyrick, 1921, Zool. Meded. 6: 155. Type locality: Indonesia (West Java, Preanger). Lectotype (♂): RMNH.

Description. *Head*: Lower frons orange white, upper frons orange grey to brownish grey; labial palpus with first segment orange white, second segment orange white with transverse strip, brownish grey to dark brown basally and apically, apical segment light brown to brown; vertex orange white intermixed with brownish grey.

Thorax: Pronotal collar brown to dark brown with orange white apices; tegulae brownish grey mixed with dark brown with white apices, mixed with orange white scales apically; mesonotum brown to dark brown with orange white apices, posterior scales tuft brown with white apices. Forewing (Fig. 9.5): Length 7.47 mm in male (n=2); male costal fold absent, termen round, costal striguale white to orange white, strigulae 1-8 paired and separated by brownish red; ground color reddish white; basal patch extending from costa between wing base and strigulae 3 to Cu, orange red to brownish red; median fascia distinct extending from costa between strigulae 4 and 5 to inner margin, brownish red to reddish brown, with brownish orange on ventral margin; postmedian fascia present as irregular striae, extending diagonally from costa between strigulae 6 and 7 to outer margin between CuA_1 and CuA_2, brownish red, area between median fascia and postmedian fascia with irregular transverse line from costa to ventral margin, ventral margin with large patch extending from wing base to middle of ventral margin, dark brown with white apices, surrounding with white scales; outer margin with brownish red line, broken by white or orange white strigulae between M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, anal margin folded with orange white pencils, ventrally light brown. Hindtibia with long hair pencil, light brown

Male genitalia (Fig. 35.1): Tegumen with arms moderately broad, high, densely scaled laterally; uncus moderately long, densely setose, dorsoanteriorly with round lobe prominence, densely setose basolateral 2/3; socii rather short, subtriangular pendant from base of uncus, densely setose; gnathos arising from midlength of tegumen, completed band like, slightly sclerotized; anellus surrounding basal 1/4 of aedeagus; aedeagus short, abruptly narrowed at midlength and sligthly widened to apex; cornuti absent; valva long, curved medially; sacculus with dense, moderately

long setae basally, ventromedially with large group of dense, long setae; basal opening margin medially with round lobe, moderately dense, short setae, dorsal sparsely setose; neck sligthly concaved ventrally; cucullus long and slender, slightly narrow to apex, rounded at apex, densely spined and setose, basally with large group of dense, moderately long spine, truncated at apices extending from cucullus dorsobasally to sacculus dorsally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂, genitalia slide NP 564), 21 Nov 2003 (1♂, genitalia slide NP565).

Distribution. Thailand, India, West Java and East Borneo.

Remarks. Specimens were collected during summer season and dry winter season at 180 m in mixed deciduous forest.

Dactylioglypha Diakonoff, 1973

Dactylioglypha Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 188. Type species: *Dactylioglypha avita* Diakonoff, 1973.

Dactylioglypha has been defined by the following characters; medium-sized moths with a wing pattern of pale and dark bands and streaks separated by whitish line; band either straight and broadest on dorsum and wing base and all coverging towards 4/5 costa, or strongly sinuate along length of wing. Male of at least some species have a hair pencil on hind tibia. The male genitalia with stout, distally hairy and curved uncus, the usually rigid and porrect socii, the well sclerotized gnathos with a broad paddle-shaped distal process and the sclerotized diaphragm linking gnathos and anellus are all very similar and diagnostic for the genus. The female genitalia are characterized by an either dorsally and ventrally interrupted rim-shaped spinulose sterigma, often with projecting ventro-lateral corners, by a rather broad and irregular colliculum, a smooth ductus and corpus bursae with two pectinate signa with some

very long truncate teeth (Diakonoff, 1973). The genus includes 5 species worldwide and all have been described from the Oriental region (Brown, 2005).

Dactylioglypha pallens Diakonoff, 1973
Figs. 9.6, 35.2

Dactylioglypha pallens Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 194. Type locality: Indonesia (West Java, Gede-Panggrango, Tjibodas). Holotype (♂): RMNH.

Description. *Head*: Upper frons greyish orange, lower frons light brown mixed with orange white; labial palpus with first segment orange white mixed with dark brown, second segment dark brown with pale orange spot dorsobasally and dorsomedially, with pale orange apical 1/4, apical segment light brown; vertex orange grey to greyish orange intermixed with brown.

Thorax: Pronotal collar brown to dark brown; tegulae light brown with pale orange apices, mixed with dark brown and orange white basomedially; mesonotum brown to dark brown intermixed with orange white. Forewing (Fig. 9.6): Length 5.45 mm in male (n=4); male costal fold absent; termen slightly curved between R_5 and M_3; ground color orange white intermixed with light brown striae; costal strigulae orange white, strigulae 1, 8 and 9 singled, strigulae 2-7 paired and separated by dark brown, some specimens strigulae 5-6 singled; basal patch extending from wing base to strigulae 3, incompleted with dark brown spot on costa between strigulae 2 and 3, broken line of dark brown scales on R_5, and subtriangular, large dark brown spot on inner margin, with apicomedial corner extending into discal cell; median and postmedian area between strigulae 4 and 7 broken by curved brownish grey striae, present as three large spots, dark brown extending from costa to inner margin, strigulae 7 with brownish grey striae extending diagonally to R_5; ocellus region with large band extending diagonally from between R_3 and R_4 to outer margin between M_1 and CuA_1, brown mixed with dark brown, and irregular brownish grey striae, broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light

brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 35.2): Tegumen moderately wide, widened near medially, with dense scales along outer margin; uncus long and curved, dilated and rounded apex, densely setose; socii arising from base of uncus, horn-like, moderately long and slender, curved medially, apices acuted, projecting posteriorly, with sparsely setose; gnathos arising from base of socii, dorsal 1/4 of tegumen, moderately sclerotized; anellus surronding at base of aedeagus, dorsal opening, extending toward dorsally, fused with gnathos; aedeagus rather short, without cornuti; sacculus with group of moderately dense spiniform setae basally and sparsely setose along ventrobasal margin, basal opening margin medially with small lobe projecting distinctly, sparse setae apically, dorsal with sparse setae; neck slightly concaved; cucullus long and slender, slightly concave medially, apex rounded, dense spines with dense spiniform setae apically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 8 Mar 2002 (1♂, genitalia slide NP 272), 14°40'03"N 98°36'07"E, 17 Apr 2002 (1♂, genitalia slide NP 313), 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP749).

Distribution. Thailand (new record) and West Java.

Remarks. Specimens were collected throughout the year at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Dactylioglypha tonica (Meyrick), 1909

Figs. 9.7, 35.3

Argyroploce tonica Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 606. Type locality: Ceylon [Sri Lanka] (Kandy). Lectotype (♂): BMNH.

Description. *Head*: Upper frons pale orange, lower frons orange white to pale orange; labial palpus with first segment light brown with white scales dorsal half, second segment brown to dark brown with orange white spot dorsobasally and dorsomedially, apical 1/4 with pale orange scales, apical segment pale orange; vertex pale orange mixed with dark brown with pale orange apices.

Thorax: Pronotal collar brown with pale orange apices mixed with white scales; tegulae light brown to brown with orange white apices; mesonotum light brown to brown with orange white apices. Forewing (Fig. 9.7): Length 5.83 mm in male (n=2); male costal fold absent, termen slightly concaved between R_5 and M_3; ground color and costal strigulae orange white, strigulae 1, 8 and 9 singled, strigulae 2-7 paired and separated by dark brown; basal patch, median and post median fascia extending diagonally confluent near costa between strigulae 7 and 8; basal patch extending from wing base to strigulae 3, and from costa to inner margin, incompleted with dark brown spot on costa between strigulae 2 and 3, broken line of dark brown scales and large subtriangular dark brown on inner margin, with apicomedial corner extending to R_4, pale orange striae beyond basal patch; median fascia incompleted dorsal part distinct on costa, extending sinuate from costa to R_2, ventral part distinct extending diagonally narrow from R_4 near strigulae 9 enlarged to mid of inner margin, dark brown intermixed with pale orange scales, with large triangular patch brown to dark brown beyond median fascia, separated by pale orange narrow line; postmedian fascia present as dark brown spot on costa extending narrowed from R_4 enlarged to inner margin near tornus, dark brown intermixed with pale orange; ocellus region with patch, light brown intermixed with pale orange extending narrow from R_3 enlarged to tornus surrounding with pale orange; wing apex dark brown; outer margin with distinct dark brown striae, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on outer margin between veins. Hindwing brown dorsally, light brown ventrally; male hindtibia with dense hair pencils, pale orange extending from base insert to small groove apically.

Male genitalia (Fig. 35.3): Tegumen moderately wide, widened basally, with moderately dense scales along outer margin; uncus long, enlarged basally, with

moderately dense setae narrowed and curved medially, dilated and rounded at apex with densely setose; socii arising from dorsal 1/4 of tegumen, long, slender, acute at apex, twist medially, projecting posteriorly, with sparse setae; gnathos arising from base of socii, moderately sclerotized, band-like; anellus surrounding basal of tegumen, dorsal opening extending dorsally, fused with gnathos; aedeagus moderately long, without cornuti; sacculus with group of dense setae basally, with sparsely setose along ventrobasal margin; basal opening margin medially with small lobe, with moderately dense setae, dorsal with moderately dense setae; neck indistinct, slightly concave; cucullus long, slightly concave medially, with dense spine, apically round and sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 30 Jul 2002 (1♂, genitalia slide NP483), 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♂).

Distribution. Thailand, Ceylon, Japan, Malaysia, Taiwan and Sri Lanka.

Remarks. Specimens were collected during the winter season at 740-990 m in montane evergreen forest.

Dicephalarcha Diakonoff, 1973

Dicephalarcha Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 254. Type species: *Dicephalarcha sicca* Diakonoff, 1973.

Dicephalarcha has been defined by the following characters; sometimes greenish-colored, marking usually formed by a large central oval spot, not reaching dorsum, emitting a sinuate streak to termen with a branch to end of dorsum. Ground color often glossy whitish or silvery. Head with appressed scales forming a flat round tuft. Antenna moderately thickened in male, fasciculate-ciliated. Labial palpus subascending, median segment abruptly dilated with roughish scales, terminal segment moderate, curved, obtuse. Forewing with termen usually concave above,

rounded beneath. The male genitalia with curved uncus, bilobed or furcated, sometime clavate, with lobes porrected. Socii usually large, flattened. Valva slender, dilated, top cleft in a rounded separate and hairy cucullus and a narrow, usually naked ventral process. The female genitalia with an aciculate funnel sterigma, colliculum slender-tubed. Ductus and corpus bursae simple. Signa with two patches of flat, scale-like and obtuse teeth (Diakonoff, 1973). The genus includes 8 species worldwide. *Dicephalarcha* includes 4 species have been described from Southeast Asia (Brown, 2005).

Dicephalarcha herbosa (Meyrick), 1909

Figs. 9.8, 81.4

Argyroploce herbosa Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 600. Type locality: India (Khasi Hills). Lectotype (♂): BMNH.

Argyroploce mniopyrrha Meyrick, 1931, Exotic Microlepid. 4: 134. Type locality: Indonesia (Java, Buitenzorg). Holotype (♀): BMNH.

Description. *Head*: Upper frons pale orange, lower frons orange white; labial palpus with first segment white, second segment orange white to pale orange mixed with dark brown spot, apical segment pale orange; vertex pale orange to light orange.

Thorax: Pronotal collar orange white mixed with pale orange; tegulae orange white to pale orange mixed with diffuse brown scales and light orange spot medially; mesonotum pale orange mixed with brown to dark brown posteriorly. Forewing (Fig. 9.8): Length 6.50 mm in female (n=1); termen slightly concaved between R_5 and M_3; ground color orange grey intermixed with brownish orange to light brown; costal strigulae orange white, strigulae 1-8 paired and separated by dark brown, strigulae 9 singled, wing with large subtriangular patch, light orange to orange intermixed with light brown to brown extending from wing base to strigulae 7, and from costa to between Cu and 1A+2A near middle of wing length, with boarder by narrow sinuate band, orange white extending from wing base to M_3, pretonal subtriangualr spot,

brown mixed with dark brown surrounding with orange white scales; ocellar region with diffuse striae between M_2 and tornus, orange grey mixed with pale orange and brown surrounding with white scales; outer margin with white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally become paler to wing base, ventral light brown.

Female genitalia (Fig. 81.4): Sternum VII densely scaled and sparsely setose; tergum VIII moderately scaled on triangular lateral extensions with sparse setae; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis extended with dense microtrichia; lamella antevaginalis reduced; ostium bursae with dense microtrichia; colliculum moderately long and narrowed, 1/5 of ductus bursae, sclerotized; ductus bursae long; ductus seminalis arising from near 1/5 of ductus bursae; corpus bursae with two moderate patches of obtuse stout teeth.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May2002 (1♀, genitalia slide NP 378).

Distribution. Thailand, India, South Celebes, Java, Borneo, Bali Is. and Moluccan Is.

Remarks. Specimens were collected the summer season at 742 m in hill evergreen forest.

Dudua Walker, 1864

Dudua Walker, 1864, List Specimens. Lepid. Insects Colln. Br. Mus. 30: 1000. Type species: *Dudua hesperialis* Walker, 1864.

Platypeplus Walsingham, [1887], in Moore, Lepid. Ceylon 3:495. Type species: *Eccopsis aprobola* Meyrick, 1886.

Platypeplum Walsingham, 1900, Indian Mus. Notes 4(1899): 105. [unjustified emendation of *Platypeplus*].

Dudua has been defined by the following characters; medium-sized with narrow forewing and with male hindwing often either triangular with straight oblique termen and modified fringe between M_2 and CuA_2. Wing pattern very diverse but typically with a series of parallel horizontal black lines in a vertical band from tornus towards costa just before apex. The rather small, slender, upcurved labial palpi, appressed to the face, are characteristic for the genus. Males have a slightly enlarged hind tibia with hair pencil, anal margin of the hindwing broadly folded under over modified scales. The male genitalia with hairy underside of their uncus continuous with the flat drooping socii, a membranous gnathos with paired and spinulose ventral humps and valva with a ventral band of dense long bristles at base of cucullus and with a patch of large spines below base of costa near margin of basal excavation are diagnostic of *Dudua*. The structure of the female genitalia of most species of *Dudua* with spinulose, ventrally split, tube-shaped sterigma and two nipple-shaped granular signa. The genus includes 30 species worldwide. *Dudua* includes 17 species have been described from Southeast Asia (Brown, 2005). *D. aprobola* is highly polyphagous, feeding on young leaves and sometimes flowers from a wide range of family (Rosaceae, Anacardiaceae, Verbenaceae, Sapindaceae, Caesalpiniaceae, Annonaceae, Lythraceae, Loranthaceae, Salicaceae (Diakonoff, 1973), also on Urticaceae (Clarke, 1976)

Dudua aprobola (Meyrick), 1886

Figs. 10.1, 36.1, 81.5

Eccopsis aprobola Meyrick, 1886, Trans. Entomol. Soc. Lond. 1866: 275. Type locality: Tonga. Holotype (♂): BMNH.

Temnolopha metallota Lower, 1901, Trans. R. Soc. S. Austral. 25: 73. Type locality: Australia (Queensland, Cocktown). Syntype (♂): SAMA.

Dudua aprobola kusaiensis Clarke, 1976, Insects Micronesia 9: 86. Type locality: Micronesia (Kusaie, Mutunlik). Holotype (♂): USNM.

Description. *Head*: Lower frons light brown mixed with dark brown, upper frons brown mixed with dark brown; labial palpus with first segment brown, second segment light brown mixed with brown, apical segment brown; vertex light brown to dark brown.

Thorax: pronotal collar brown to dark brown mixed with orange white; tegulae light brown mixed with brown basal half, apical half greyish brown mixed with greyish orange; mesonotum orange white with transverse dark brown strip medially; posterior scales tuft present, brownish orange. Forewing (Fig. 10.1): Length 8.09 mm in male (n=7), 7.5 mm in female (n=2); male costal fold absent; termen slightly rounded, ground color orange white to orange grey, costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch indistinct present as irregular brown striae from costa to inner margin; median fascia incompleted extending from costa narrow to inner margin, separated by orange white narrow strip between CuA_2 and 1A + 2A, upper part brown, lower part on inner margin brown mixed with dark brown strigulae 5 and 6 with distinct grey striae extending diagonally from costa to R_3; median fascia with large patch between R_4 and tornus greyish orange intermixed with brownish grey, apical wing 1/4 or ocellar region with striae extending from R_4 separated to outer margin at between M_1 and M_2 and to inner margin near tornus, dark brown intermixed with white, tornus with greyish brown patch; outer margin with brown striae broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, outer margin sinuate, inner margin forming sclerotized fold upwardly. Hindtibia with pale orange hair pencil extending from base of tibia to apical 2/3.

Male genitalia (Fig. 36.1): Tegumen moderately broad, with dense setae along outer margin; uncus rather short, wide, constricted basally, slightly hooked, dilated apically, densely setose anterior margin; socii pendant from base of uncus, moderately long, rounded apically, densely setose; gnathos arising from midlength of tegumen,

band-like, moderately sclerotized, ventromedially with two small rounded lobes, sclerotized, dense microtrichia; anellus surrounding basal 1/4 of aedeagus; aedeagus short; cornuti absent; sacculus with group of moderately long, dense setae basally, dorsal with group of moderately long, dense spines and sparse setae from basal opening to cucullus base; neck indistinct; cucullus broad, apex rounded, dense spines, with setae on inner margin and sparse setae along outer margin, ventrobasally with rounded lobe, dense spines, with moderately dense, long setae underside.

Female genitalia (Fig. 81.5): Sternum VII densely scaled, posterolateral area with sparse scales except posterior margin, with dense microtrichia throughout except posterolaterally, posterior margin deeply concave medially; tergum VIII scaleless, with dense scales on triangular lateral extensions upper half; papillae anales densely setose; lateral setae with papillose bases; ostium bursae oval-shaped, slender; sterigma verticled, upper half thickened, slightly concave on dorsal margin, dense microtrichia; lower half subtriangular, pointed laterally, without setae; colliculum long and slender 1/3 of ductus bursae; ductus seminalis arising from mid of ductus bursae; corpus bursae large with small signa, thorn-like with basal rounded plate, granulated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'15"E, 5 Feb 2002 (4♂, genitalia slide NP 210, NP225, NP236, NP279), 14°41'34"N 98°24'03"E, 9 Mar 2002 (1♂, genitalia slide NP219), 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♀), 10 Sep 2002 (1♀, genitalia slide NP457), 21 Nov 2003 (1♂, genitalia slide NP587), 14°41'43"N 98°27'34"E, 20 Feb 2004 (1♂, genitalia slide NP647).

Distribution. Thailand, throughout the Indo-Australian region to the South Pacific Is., including the Silicy Is., Austral Is., North China, Taiwan and Japan.

Remarks. Specimens were collected throughout the year at 180-1,020 m in hill evergreen forest.

Dudua brachytoma Diakonoff, 1973

Figs. 10.2, 36.2, 82.1

Dudua brachytoma Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 423.

Type locality: Indonesia (West Java, Buitzenborg). Holotype (♂): RMNH.

Description. *Head*: Lower frons orange white, upper frons dark brown; labial palpus with first segment light brown, second segment light brown intermixed with dark brown with greyish orange apically, apical segment greyish orange; vertex light brown mixed with dark brown.

Thorax: Pronotal collar light brown to brown; tegulae brown mixed with dark brown, with each scales orange white at apices; mesonotum light brown to brown, with each scales orange white at apices, posterior scales tuft presented, brown mixed with dark brown basally. Forewing (Fig. 10.2): Length 7.27 mm in male (n=4), 7.63 mm in female (n=3); male costal fold absent, termen rounded, ground color light brown; costal strigulae white, strigulae 1-7 paired and separated by dark brown, strigulae 8-9 singled, basal patch indistinct present as diffuse brown striae from costa to inner margin, with distinct dark brown spot on inner margin near wing base extending from inner margin to 1A+2A; median fascia extending large from costa narrowed to inner margin, brown mixed with dark brown dorsal half, ventral half brown to dark brown with each scales orange white apices, interfascia between strigulae 5 and 6 with dash lines, dark brown, extending from costa to inner margin near tornus surrounding with orange white mixed with light brown scales, tornus with silvery spot; outer margin with distinct dark brown striae, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin forming sclerotized, ventral light brown. Hindtibia with dense white hair pencils extending from base of mid hindtibia.

Male genitalia (Fig. 36.2,): Tegumen moderately broad, high, basoanterior 1/3 with rounded lobe, densely setose along outer margin; uncus moderately long, slightly

hooked, widened basally, with pointed triangular lobe basolaterally, densely setose anterior margin; socii small pendant from base of uncus, rounded apically, moderately dense setae; gnathos arising from midlength of tegumen, curved band-like, moderately sclerotized, ventrolaterally with very short, dense spine-like, ventromedially with two groups of short, dense stout spine-like; anellus surrounding basal 1/3 of aedeagus, basal opening; aedeagus short; cornuti absent; valva long, rather broad apically; sacculus with group of moderately long setae basally, median with group of short to moderately long, dense spines extended towards cucullus, and group of short, dense spiniform setae on basal opening, with group of dense spiniform setae under cucullus prominence; cucullus long, apex oblique truncated, triangulary, dense spines, outer margin with long, sparse setae, ventrobasally with long, dense spiniform setae.

Female genitalia (Fig. 82.1): Sternum VII with large, sclerotized plate, posterior margin concaved medially, posterolateral corner with margin folded, forming rounded lobe, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis fused, forming sclerotized cup, slightly wide apically, protuding dorsally, dense microtrichia, anterior margin concaved medially, V-shaped; ductus bursae with anterior 1/3 sclerotized; ductus seminalis arising from midlength of ductus bursae; corpus bursae large, with two short signa, obtuse, granulated, rounded basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'16"N 98°23'57"E, 22 Dec 2001 (1♂, genitalia slide NP27, 1♀, genitalia slide NP25), 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP158), 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♂, genitalia slide NP221, 1♀, genitalia slide NP220), 14°40'03"N 98°36'07"E, 22 Oct 2003 (1♀), 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂).

Distribution. Thailand and Java.

Remarks. Specimens were collected during the late of rainy season to winter season at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Dudua charadraea (Meyrick), 1909

Figs. 10.3, 36.3

Argyroploce charadraea Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 594. Type locality: Ceylon [Sri Lanka] (Maskeliya). Lectotype (♂): BMNH.

Argyroploce ptarmicopa Meyrick, 1936, Exotic Microlepid. 4: 612. Type locality: Formosa [Taiwan] (Taihoku [Taipei]). Lectotype (♂): BMNH.

Description. *Head*: Lower frons dark brown intermixed with brownish orange, upper frons dark brown; labial palpus with first segment dark brown, second segment dark brown, apical segment light brown; vertex orange white mixed with dark brown.

Thorax: Pronotal collar dark brown, tegulae orange grey with dark brown basal 1/3; mesonotum white mixed dark brown. Forewing (Fig. 10.3): Length 6.88 mm in male (n=2); male costal fold absent; termen rounded, ground color white, costal strigulae white, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin as diffuse dark brown striae; median fascia incompleted extending irregular from costa to inner margin, distal margin extending diagonally from costa to R_3, angled and extending to inner margin, brown mixed with dark brown, strigulae 5 with grey striae extending from costa enlarge to inner margin near tornus beyond median fascia separated between M_1 and M_2 by ground color; postmedian fascia present as dark brown spot on costa, apical 1/4 of wing with irregular turned U-shaped between R_4 and CuA_2, dark brown surrounding with white scales; tornus with silvery small patch; outer margin with dark brown striae broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally with inner margin

folded, sclerotized forming groove, ventral light brown except in anal fold area, orange white. Hindfemur with moderately dense hair pencils, orange white base ventrally extending to apical end.

Male genitalia (Fig. 36.3): Tegumen moderately broad, with dense setae along outer margin; uncus moderately long and wide, slightly hooked, dilated apically, densely setose anterior margin; socii pendant from base of uncus, moderately long, rounded apically, densely setose; gnathos arising from basal 1/3 of tegumen length, band-like, ventromedially with two small rounded lobes, sclerotized, dense microtrichia; anellus surrounding basal of aedeagus, basal opening; aedeagus short; cornuti absent; valva long and slender; sacculus with group of moderately long, dense setae basally, median with group of moderately long, dense spines and group of moderately short spiniform setae on basal opening, dorsal with row of moderately long, sparse spines to base of cucullus; neck indistinct, slightly concave ventrally, with group of dense spiniform setae; cucullus long, apex narrowed, basally with rounded lobe, dense spines mixed with setae, outer margin with sparse setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♂, genitalia slide NP119), 14°41'27"N 98°27'29"E, 14 May 2002 (1♂, genitalia slide NP365).

Distribution. Thailand (new record), Ceylon, Formosa, West Java and West Sumatra.

Remarks. Specimens were collected during the winter season to summer season at 255-1,045 m in dry evergreen forest and hill evergreen forest.

Dudua tetanota (Meyrick), 1909

Figs. 37.1, 82.2

Argyroploce tetanota Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 602. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 37.1): Tegumen moderately broad, with dense scales along outer margin; uncus long, hooked, apex bilobed, densely setose; socii pendant from base of uncus, moderately long, rounded apically, densely setose; gnathos arising from midlength of tegumen, moderately sclerotized, band-like, dense microtrichia, ventromedially with two small rounded lobes, sclerotized, dense microtrichia; anellus surrounding base of aedeagus; aedeagus short, basal and lateral opening; cornuti absent; sacculus with group of moderately dense setae basally, median with lobe protuded, dense spines and sparse setae apically, ventromedially with group of dense setae, dorsal with dense setae, neck indistinct; cucullus long and slender, apex rounded, basal with pointed transverse process, dense spines, except apically and inner margin, outer margin with row of long dense setae extending from sacculus ventromedially to basal of cucullus.

Female genitalia (Fig. 82.2): Sternum VII broad, densely scaled and microtrichiate throughout, sparsely setose anteriorly, posterior margin deeply concave medially, widened; tergum VIII sparsely setose, moderately scaled on triangular extensions; papillae anales densely setose; lateral setae with papillose bases; ostium bursae slender, erected, slightly constricted; sterigma thickened, dense microtrichia with subrhomboidal-shaped upper edge, lower edge thickened, dilated laterally, reticulated toward basal rounded plate; colliculum long and slender 1/3 of ductus bursae; ductus seminalis arising from mid of ductus bursae; corpus bursae large with two signa, thorn-like with basal rounded plate, granulated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♂, genitalia slide NP101, 1♀, genitalia slide NP100), 14°41'40"N 98°24'15"E, 5 Feb 2002 (3♂, genitalia slide NP215, NP212, NP227), 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂).

Distribution. Thailand and India.

Remarks. Specimens were collected during the winter season at 180-1,020 m in mixed deciduous forest and hill evergreen forest.

Gnathmocerodes Diakonoff, 1968

Gnathmocerodes Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 71. Type species: *Gnathmocerodes petrifraga* Diakonoff, 1968.

Agnathmacera Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 27. Type species: *Gnathmocerodes labidophora* Diakonoff, 1973. [subgenus of *Gnathmocerodes*].

Gnathmocerodes has been defined by the following characters; medium-sized intricately light brown to brown moths with a large darker brown blotch or mark inverted-triangular shape between 2/5 and 4/5 costa, a small pale roundish spot halfway between closing vein and termen across R_5 and M_1, and usually with an at least partly developed paler band across wing from 2/5 costa to middle of dorsum, then back towards apex, curving around pale spot and ending in the middle of termen. *Gnathmocerodes* has sinuate, subporrect and moderately widened labial palps and characteristic secondary sexual modification to hindwing and hind legs. The male hind tibia and the first tarsal segment are often enlarged by scale brushes as well as a large tibial pencil, and the anal area of hindwing may be produced into a medially projection triangular lobe with inwardly oblique anal margin. The male genitalia with abroad, flat, weakly sclerotized and dorsally hairy uncus, with drooping narrow socii and with either medially strongly constricted, usually asymmetrical valvae with a group of short spines on the margin of the basal excavation and/or an often bipartile tuft of bristles on the projecting ventral angle towards the base of the valva are diagnostic for *Gnathmocerodes*. The female genitalia with a strongly raised spinulose rim encircling the entrance to the ostium, a very long tube-like colliculum and a large single signum (Diakonoff, 1973). The genus includes 6 species worldwide. *Gnathmocerodes* includes 3 species has been described from Southeast Asia (Brown, 2005). Spitzer and Jaros (1985) noted that *Gnathmocerodes petrifraga* Diakonoff

feeding in rolled or folded leaves on *Barringtonia acutangula* L. (Lecythidaceae), and some species reared from fruit, top shoots and leaves of *Barringtonia* and from species of Annonaceae and Malvaceae (Diakonoff, 1973).

Unplaced *Gnathmocerodes*

Gnathmocerodes sp. A

Figs. 10.4, 37.2

Description. *Head*: upper frons greyish orange long scales mixed with olive brown short scales, lower frons yellowish white short scales and brownish orange; labial palpus with first segment pale orange mixed with greyish red and second segment greyish orange to light brown and brown, apical segment brownish grey with reddish grey at apex; vertex greyish orange to brownish grey.

Thorax: Pronotal collar greyish red with greyish brown and yellowish white apices; tegulae dark brown mixed with greyish orange, brown and dark brown, apical scales with orange white apices; mesonotum light brown intermixed with reddish brown with brownish red posterior tufts. Forewing (Fig. 10.4): Length 8.7 mm in male (n=1); male costal fold absent; termen round, ground color and costal strigulae yellowish white to orange white; costal strigulae 1 and 2 presented as 3 pairs at base, strigulae 3 and 4 paired and separate, strigulae 5 and 6 paired and separated, strigulae 7 and 8 paired and separated, strigulae 9 single, strigulae separated by dark brown fascia and umbrae; subbasal fascia presented distinct on the costal margin between strigulae 3 and 4 and umbrae to inner margin; median fascia present on costal margin between strigulae 4 and 5, extending close to inner margin, fascia outer margin with distinct dark brown spot at the end of discall cell; postmedian fascia present as fused with median fascia between strigulae 6 and 7, extend clear to half of wing width, a narrow sinuate line of dark brown extending from postmedian fascia to inner margin, outer 1/4 of wing with greyish red to dark brown forming circular, a dark brown line extending from between strigulae 7 and 8 to outer margin between R_5 and M_1 dark brown at apex of wing between strigulae 9 and 10 close to outer margin of wing with

dark brown mixed with greyish orange fascia from R_5 to CuP, yellowish white terminal strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3, M_3 and M_4, CuA_1 and CuA_2. Hindwing brown, moderately hair pencil on base of Cu and long hair pencil at end margin.

Male genitalia (Fig. 37.2): Tegumen with arms broad and flat with sclerotized line, scale and setae absent, uncus a flat, apically rounded, moderately setose, socii triangularly fused with uncus, moderately setose; guathos arising from apical 1/3 of tegumen, red-line and strong by sclerotized basally with heavily sclerotized projection two long horn diverging at top, anellus surrounding basal of aedeagus, fused with gnathos, aedeagus long slightly curved at middle, straight and parallel side apically, cornuti absent, juxta triangular ventrally truncated, valva asymmetrical, sacculus of left valva with ventrally directed spine clusler near middle, right sacculus without it, both side of sacculus with moderately spines near base of saculus and slightly spines at inner margin near apical of sacculus, sacculus ventrally with row of spines; neck with narrow stalk and deeply incised ventrally; cucullus board dense short and large setae ventrally, dense fine short setae at outer margin and graduallly large to middle area of cucullus.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP77).

Remarks. Specimen was collected during the rainy season at 380 m in hill evergreen forest.

Hoplitendemis Diakonoff, 1973

Hoplitendemis Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 275. Type species *Hoplitendemis pogonopoda* Diakonoff, 1973.

Hoplitendemis has been defined by the following characters; head with appressed scales, antenna in male subserrulate, ciliated. Labial palpus moderate,

ascending, closely appressed to face, median segment dilated throughout, terminal segment short, porrected. Anterior tibia and femur in the two sexes darkly colored, contrasting with the color of other legs, anterior femur dilated with scales, roughish along lower edge and at base. Posterior tibia with upper edge flattened, forming a gully in which is concealed a slender pencil of hairs from base with short glossy smoothly appressed scales, only towards apex forming a colored triangular flat tuft above, extending over elongated basal segment of tarsus. Forewing rather narrow, oblong-suboval with a large prominent marginal tuft of scales beyond base of dorsum. The male genitalia with high tegumen, uncus moderate, conical, ventrally with a small patch of bristles. Socii extremely large, reaching middle of tegumen, rigid, pending, inner edge with an obtuse prominence, lower arm broad and curved. Gnathos with a transverse strong band, emarginated in middle above, with a long clavate rigid. Valva narrowed, sacculus with a single large spine, lower edge of cucullus throughout with large sparse spines, a group of these in disc medially, with small aedeagus. The female genitalia with large ovipositor lobe, a dorsal cleft. Lobes of sternum 9 with peculiar numerous flat lamellae. Sterigma diverserly shaped. Ductus and corpus bursae simple (Diakonoff, 1973). The genus includes 4 species worldwide and all have been described from Southeast Asia (Brown, 2005).

Unplaced *Hoplitendemis*

Hoplitendemis sp. A

Figs. 10.5, 37.3

Description. *Head*: Upper frons dark brown scales with laterally scales white apically, lower frons short dark brown scales; labial palpus with first segment dark brown medially, white scales dorsally and yellowish grey ventrally, second segment brown to dark brown intermixed with light brown; white scales apically, apical segment dark brown with white scales at apex; vertex dark brown with almost scales white apically.

Thorax: Pronotal collar dark brown mixed with brown, white apically; tegulae dark brown with white at species; mesonotum brown to dark brown with white at species; posterior tufts dark brown with white apically. Forewing (Fig. 10.5): Length 6.92 mm in male (n=1); male costal fold absent; ground color brown; costal strigulae white, strigulae 1-2 and 8-9 absent, strigulae 3–4 and 7 paired and separated by dark brown, costal strigulae 5–6 singled; basal patch dark brown between the wing base to strigulae 3 intermixed with diffuse silvery scales, silvery stria extending irregularly from costa between strigulae 3 and 4 to inner margin, median fascia indistinct with diffuse white spots present at the middle of wing irregulary, silvery stria extending diagonally from costa between strigulae 5 and 6 to inner margin near tornus; postmedian fascia indistinct; ocellus region with diffuse white spots between R_5 and CuA_2 and silvery scales near outer margin between M_1 and tornus, outer marginal scales dark brown, except marginal strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown, with metallic green and purple when viewed at angle to the light. Hindwing light brown except area of forewing overlap anterior to S_c+R_1. Foreleg lower area with pack of dense scales, expanded underneath between basally to apically, dark brown dorsally, ventrally almost white with dark brown surrounded. Metafemur with white dorsal scales tuft extending from basal 2/3 of femur length.

Male genitalia (Fig. 37.3): Tegumen moderately wide, widened dorsally, with dense scales along outer margin; uncus reduced to moderately lobe, apex rounded, with moderately dense setae; socii strongly sclerotized, inner socii large arising from base of uncus, enlarged to apically, dentate at apex, with moderately dense setae, outer socii, horn like, dentate at apex, pendant to mid of tegumen, with moderately dense setae; gnathos arising from near mid of tegumen dorsally, transverse sclerotized band-like, emarginated medially above, with a long median appendage, slightly concave medially, bilobed at apex, sclerotized; anellus closely surrounding basal 1/3 of aedeagus; aedeagus short, without cornuti; juxta subtriangular, round ventrally; sacculus with dense setae basally to medially, ventromedially with group of dense setae, median with sparse spiniform setae near basal opening, dorsal with sparsely setose, dorsoapically forming sclerotized small lobed, bilobed, larger lobe projecting

ventrally; neck slightly concave medially, with dense setae along dorsal margin; cucullus moderately long, slightly concave medially, sparsely setose, lower edge with sparse spines, round at apex with dense setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'01"N 98°27'28"E, 19 Jun 2002 (1♂, genitalia slide NP388).

Remarks. Specimen was collected during the late of summer season at 380 m in mixed deciduous forest.

Lobesia Guenée, 1845

Lobesia Guenée, 1845, Annls. Soc. Ent. Fr. (2) 3: 297. Type species: *Asthenia reliquana* Hübner, [1825] 1816.

Polychrosis Rogonot, 1894, Annls. Soc. Ent. Fr. 63: 209. Type species: *Tortrix batrana* [Denis & Schiffermüller], 1775.

Lomaschiza Lower, 1901, Trans. R. Soc. S. Austral. 25: 68. Type species: *Lomaschiza physophora* Lower, 1901.

Byrsoptera Lower, 1901, Trans. R. Soc. S. Austral. 25: 77. Type species: *Brysoptera xylistis* Lower, 1901. [preoccupied].

Steriphotis Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 259. Type species: *Sterophotis peltophora* Meyrick, 1911.

Analdes Turner, 1916, Trans. R. Soc. S. Austral. 40: 533. Type species: *Analdes hypolepta* Turner, 1916.

Lomaschizodes Diakonoff, 1954, Zool. Verh. Leiden 22: 15. Type species: *Grapholitha extrusana* Walker, 1863.

Steriophotis Bradley, 1961, Bull. Br. Mus. (Nat. Hist.), Ent. 10: 123. [misspelling of *Steriphotis*].

Harmosma Diakonoff, 1963, Tidjschr. Ent. 106: 354. Type species: *Polychrosis harmonia* Meyrick, 1908.

Neolobesia Bae & Komai, 1991, Tyô to Ga 42: 136. Type species: *Lobesia coccophagus* Falkovitsh, 1970. [subgenus of *Lobesia*].

Pirireisia Koçak, 1981, Priamus 1: 114. [replacement name for *Byrsoptera*].

Neodasyphora Bae & Liu, 1995, Japan J. Ent. 63: 108. Type species: *Polychrosis cunninghamiacola* Liu & Bai, 1977. [subgenus of *Lobesia*].

Lobesia has been defined by the following characters; small to medium-sized usually intrically patterned and mainly brownish moths, frequently with characteristic forewing marking consisting of roughly transverse banding on basal half ending in a transverse triangle with apex towards termen and connected with a large circular blotch centred on tornus and with three pairs of costal strigulae before apex merging into an outwardly curved while line running to termen and delineating a small round apical spot. The antennal flagellum is scaled also on its anterior surface. The strongly modified forewing venation with deflected R_1 runing parallel to costa and distally approximated to tip of R_2 is presented in most species of *Lobesia* and is characteristic for the genus, together with the pterostigma between R_1 and costa usually present in the male. Males of *Lobesia* are usually characterized by a number of secondary sexual modification: pterostigma in forwing, often a modified hindwing of triangular shape with enlarged anal area and reduced translucent scaling, tibial pencil, paired elongate pockets with modified scales laterally on the fused first two abdominal sternites and in a few taxa eversible scale pencil deeply invaginated laterally between segments 3 and 4. Of those only the scale pockets laterally on S2 are diagnostic for *Lobesia*, being present at least in reduced from in all group. The male genitalia with the usually hooked apodeme for muscle m4, flap-like socii continuous with the

teguminal apex and the valva with a longitudinal narrow fold or ridge along its outer surface and with several groups of spines along the basal half of the ventral edge, usually separated by one or two deep notches, are diagnostic for the genus. The female genitalia of *Lobesia* are very diverse, with a complex and often deeply invaginated sterigma, and primarily reflect species group within the genus, but inception of ductus seminalis close to neck of corpus bursae in a diagnostic feature (Diakonoff, 1954; Kuznetsov, 1987). The genus includes 109 species worldwide. *Lobesia* includes 24 species have been described from Southeast Asia (Brown, 2005). In Palaearctic and Oriental regions *Lobesia* is found on a wide range of host families, mainly feeding in spun shoota, flowers, seedheads and fruit. The grapevine pest *botrana* (Denis & Schiffermüller) feeds in flower and developing or ripe fruit of *Vitis vinifera* L. (Vitaceae). Many species of *Lobesia* are polyphagous (Diakonoff, 1954; Bae and Komai, 1991).

Lobesia aeolopa Meyrick, 1907

Figs. 10.6, 38.1, 38.2, 82.3

Lobesia aeolopa Meyrick, 1907, J. Bombay. Nat. Hist. Soc. 17: 976. Type locality: Ceylon [Sri Lanka] (Maskeliya). Lectotype (♂): BMNH.

Lobesia proterandra Meyrick, 1921, Zool. Meded. 6: 155. Type locality: Indonesia (Java, Ardjoeno). Syntypes (1♂, 1♀): RMNH.

Lobesia dryopelta Meyrick, 1932, Exotic Microlepid. 4: 225. Type locality: Indonesia (Java, teak-forest). Lectotype (♂): BMNH.

Lobesia eustales Bradley, 1956, Bull. Br. Mus. (Nat. Hist.), Ent. 4: 146. Type locality: Australia (Lord Howe Island, Mt. Lidgbird). Holotype (♂): BMNH.

Description. *Head*: Lower frons orange white, upper frons greyish orange; labial palpus with first segment orange white, second segment brownish orange

intermixed with dark brown spot, apical segment greyish orange; vertex greyish orange.

Thorax: Protonal collar brownish orange; tegulae light brown to greyish orange mixed with brownish orange, with dark brown basally; mesonotum greyish orange intermixed with brownish orange; posterior scales tuft brownish orange mixed with light brown. Forewing (Fig. 10.6): Length 4.36 mm in male (n=2), 4.51 mm in female (n=4); male costal fold absent, termen round, costal margin sinuate between strigulae 6 and 7; ground color orange white to pale orange, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown, basal patch extending from wing base to strigulae 3 from costa to inner margin, brownish orange mixed with brown and dark brown, intermixed with ground color, area between basal patch and median fascia with large interfascial spot extending from inner margin to R, grey; median fascia extending from costa to inner margin, dark brown mixed with light brown, becoming paler to inner margin, distal margin extending diagonally to midwing, curved upwardly to M_1 and extending diagonally inwardly to inner margin; preternal spot present as irregular grey striae separated from median fascia by ground color extending from inner margin to M_1; postmedian fascia distinct on costa extending from costa to R_3; ocellar region with large patch, brown intermixed with dark brown, between R_4 and M_3, strigulae 8 and 9 with narrow dark brown line confluence on R_4 and separated one line to outer margin, one line extending irregularly to median fascia surrounding by ground color; wing apex brown intermixed with dark brown; outer margin with distinct dark brown spots alternating with ground color. Underside light brown, with yellowish grey spots on costa, area between strigulae 6 and 7 sinuate. Hindwing light brown becoming darker on wing apex dorsally, ventral light brown. Hindtibia with hair pencil, greyish orange, originating from base of tibia inner margin extending to posterior 1/4.

Abdomen (Fig. 38.2): Sternum I+II with a pair of lateral pouches situated in membrane, each side containing two large groups of dense scales, oval-shaped.

Male genitalia (Fig. 38.1): Tegumen moderately broad, with dense scales on outer margin basally, slightly sparse to dorsal 1/3 of tegumen, dorsoposteriorly with dense scales; uncus reduced as round lobe, slightly incised dorsomedially; socii small plate, subtriangular, pendant from dorsolaterally of tegumen, moderately dense scales apically; gnathos arising from near midlength of tegumen, narrowed, band-like, moderately sclerotized basally; anellus surrounding basal of aedeagus; aedeagus long, slender, curved medially, slightly tapered to apex, without cornuti, inner margin with two distinct small denticles dorsoapically; sacculus with moderately dense setae basally to medially, ventrobasally with verticle row of short spines, ventromedially with triangular lobe, projecting ventrally, with dense,short mixed with moderately long spines from inner margin to outer margin; neck deeply incised ventrally, narrowed, sparse setae ventrally; cucullus moderately long, slightly concave medially, apex rounded, ventrobasally with small round lobe, dense spines in different sizes and shapes mixed with spiniform setae, with short spines along outer margin, basally with distinct one long spine.

Female genitalia (Fig. 82.3): Sternum VII densely scaled, with large rounded lobe posteromedially, dense microtrichia, laterally connected with large subtriangular lobes folded beneath sternum VII plate posterolaterally, projecting ventrally, with dense microtrichia on surface; tergum VIII with sparse setae posteriorly extended to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis forming inverted long tube, cone-shaped, widened ventrally; ostium bursae rather narrowed, with smooth margin, upper margin bilobed, lower margin deeply excavation medially; colliculum narrowed, long posterior 1/4 of ductus bursae; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae without signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 12 May 2002 (1 ♂, genitalia slide NP295), 14°41'31"N 98°24'27"E, 13 May 2002 (1♀, genitalia slide NP479), 19 Jul 2003 (1♀, genitalia slide NP655), 24 Aug 2003 (1♂, genitalia slide NP649), 14°39'02"N 98°31'40"E, 22

Dec 2002 (1♀, genitalia slide NP654), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP657).

Distribution. Thailand, India, Sri Lanka, Myanmar, Java, Solomon Is., Korea, Japan, Taiwan, Africa and Madagascar.

Remarks. Specimens were collected throughout the year at 180-950 m in mixed deciduous forest and hill evergreen forest.

Lobesia genialis Meyrick, 1912
Figs. 10.7, 38.3, 38.4

Lobesia genialis Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 869. Type locality: Ceylon [Sri Lanka] (Peradeniya). Holotype (♂): BMNH.

Description. *Head*: Lower frons white, upper frons white to orange white; labial palpus with first segment white, second segment brown to dark brown intermixed with greyish orange with white scales dorsomedially and apically, apical segment orange white; vertex white to orange white mixed with light brown and brown.

Thorax: Pronotal collar brown mixed with brownish orange; tegulae brownish orange intermixed with dark brown with orange white medially; mesonotum brownish orange mixed with dark brown, posterior scales tuft present, each scales brownish orange and brown, darker to brown apically with greyish orange apices. Forewing (Fig. 10.7): Length 5.42 mm in male (n=2); male costal fold absent; termen strongly concaved between R_5 and CuA_2, tornus rounded, costal margin sinuate between strigulae 5 and 7; termen rounded, ground color white mixed with orange white; costal strigulae white, strigulae 1-9 paired and separated by dark brown, basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, dark brown mixed with brownish orange to light brown and grey; interfascia subtriangular spot, grey, between basal patch and median fascia extending from inner margin to mid wing;

median fascia distinct extending from costa to inner margin with distal margin extending diagonally curved to R_5 and extending diagonally to inner margin, dark brown and becoming paler to greyish orange on inner margin, pretornal triangular spot, dark brown beyond median fascia separated by ground color; postmedian fascia short extending from costa to R_5, dark brown; preterminal fascia present as spot on costa, dark brown mixed with brownish orange, strigulae with dark brown narrow line surrounding with white scales extending separated, one line curved to near strigulae 8, the other one extending to inner margin at between R_5 and M_1; wing apex with circular spot light brown mixed with brown, ocellus region with patch, between R_5 and tornus, light brown becoming paler to tornus; outer margin with white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with white spots on costa. Hindwing brown dorsally, with costal margin sinuated medially with dense scales on costa, ventrally light brown.

Abdomen (Fig. 38.4): Sternum I+II with a pair of lateral pouches situated in membrane, each side containing a large patch of dense scale, suboval-shaped.

Male genitalia (Fig. 38.3): Tegumen moderately broad, with slender lobe basoanteriorly, moderately dense scales laterally, with dense scales dorsoposteriorly; uncus reduced as round lobe, constricted medially; socii rather small plate arising from dorsoposteriorly of tegumen, moderately dense, short and long setae; gnathos arising from near middle of tegumen, strongly sclerotized, with dense and large denticles throughout, narrowed band-like, with two moderately large lobe, horn-like, medially, projecting dorsally; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately long, slender, with two large and two small cornuti apical 1/3; juxta triangular, rounded ventrally; sacculus with group of moderately dense setae basally, median with sparse setae, ventromedial margin with deeply excavation, with dense short setae along margin; neck deeply incised, with sparse setae ventrally; cucullus moderately long, slender, apex rounded sparsely short setae, with dense setae apically, ventrobasally with small lobe, with dense short spines on outer margin to over midlength of cucullus.

Speciemens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 30 Sep 2002 (1♂, genitalia slide NP437), 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂, genitalia slide NP648).

Distribution. Thailand and Sri Lanka.

Remarks. Specimens were collected during the rainy season to dry winter season at 180-195 m in mixed deciduous forest.

Lobesia kurokoi Bae, 1995

Figs. 10.8, 82.4

Lobesia kurokoi Bae, 1995, Microlepid. Thailand 3: 36. Type locality: Thailand (Chiang Mai, Doi Pakia). Holotype (♀): OPU.

Description. *Head*: Lower frons orange white, upper frons orange white to pale orange; labial palpus with first segment orange white with dark brown scales dorsally, second segment light brown mixed with dark brown, with orange white apically, apical segment orange white; vertex pale orange mixed with brownish orange to light brown, some scales with dark brown apices.

Thorax: Pronotal collar brownish grey; tegulae basal half dark brown mixed with brownish orange to light brown, pale orange apical half; mesonotum greyish orange with dark brown strip anteriorly, poterior scales tuft brownish orange with each scales dark brown apices. Forewing (Fig. 10.8): Length 4.91 mm in female (n=1), costal margin slightly sinuated medially, termen rounded; ground color orange white to pale orange; costal strigulae orange white, strigulae1-9 paired and separated by dark brown; basal patch indistinct extending irregularly from costa between wing base and strigulae 3 to inner margin, brown to dark brown mixed with brownish orange; median fascia distinct extending obliquely from costa between striguale 4 and 5 to inner margin near tornus, separated by white obliquely narrow strip between CuA_1 and inner margin, pretornal subtriangular spot light brown to brown; postmedian

fascia forming dark brown spot on costa between strigulae 6 and 7; preterminal fascia extending diagonally from costa between strigulae 8 and 9 to outer margin, dark brown; wing apex brown with small spot, dark brown medially; ocellus region with patch, pale orange becoming darker to light brown dorsally; outer margin with distinct dark brown line, broken by white strigulae between M_1 and M_2. Underside light brown. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 82.4): Sternum VII moderately sclerotized, densely scaled; tergum VIII moderately dense setae on posterior margin, extending to triangular latertal extensions; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis absent; sterigma distinct, dense spines, forming large longitudinal tube-shaped, with large rounded basal plate, lateral deeply concaved, upper margin higher than ostium bursae, constricted medially, lower margin deeply concave, lower than ostium, anterior part without spines; ostium bursae with smooth rim; antrum forming long, slightly sclerotized tube; ductus seminalis arising from near mid of ductus bursae; corpus bursae without signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♀, genitalia slide NP599).

Distribution. Thailand.

Remarks. Specimen was collected during the dry winter season at 180 m in mixed deciduous forest.

Lobesia lithogonia Diakonoff, 1954

Figs. 11.1, 38.5, 38.6, 82.5

Lobesia lithogonia Diakonoff, 1954, Zool. Verh Leiden 22: 49. Type locality: Indonesia (West Java, Buitenzorg). Holotype (♂): RMNH.

Description. *Head*: Lower frons orange white, upper frons greyish orange; labial palpus with first segment orange white, second segment brownish orange with small dark brown spot dorsoapically, apical segment brownish orange; vertex greyish orange to brownish orange.

Thorax: Pronotal collar greyish orange mixed with brown; tegulae greyish orange mixed with light brown; mesonotum greyish orange intermixed with light brown; posterior scales tuft brownish orange with light brown apically. Forewing (Fig. 11.1): Length 5.21 mm in male (n=6), 4.81 mm in female (n=1); male costal fold absent; termen rounded, costal margin sinuated, strigulae 1-9 paired and separated by dark brown between strigulae 6 and 7; ground color pale orange, basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin; present as irregular striae, brownish orange mixed with dark brown, except distal margin of patch with distinct dark brown intermixed with light brown, interfascial spot between basal patch and median fascia extending from inner margin to midwing, light brown mixed with brown; median fascia extending irregularly from costa to inner margin, distal margin extending diagonally from costa to midwing and curved upward to R_5 and extending narrow to inner margin, brownish orange to light brown mixed with dark brown on distal margin, pretornal subtriangular patch, present as irregular dark brown striae, separated from median fascia by ground color; postmedian fascia distinct on costa between costa and R_3, strigulae 8 and 9 with dark brown line confluent at R_5 and extending to outer margin; ocellus region with large patch brownish orange intermixed with diffuse dark brown spot extending between R_4 and M_3; wing apex brownish orange mixed with dark brown, outer margin with distinct dark brown striae, broken by white strigulae between M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown, becoming darker to wing apex dorsally, ventral light brown. Hindtibia with hair pencil originating from base of tibia dorsally extending along tibia length, pale orange with white apically.

Abdomen (Fig. 38.6): Sternum I+II with a pair of lateral pouches situated in membrane, each side containing two large groups of dense scale, suboval-shaped.

Male genitalia (Fig. 38.5): Tegumen rather narrow, with dense scales on outer margin basally, slightly sparse to dorsal 1/3 of tegumen, dorsoposteriorly with dense scales; uncus reduced as rounded lobed; socii rather small, subtriangular, arising from dorsolaterally of tegumen, with dense, moderately long spiniform setae apically; gnathos arising from near midlength of tegumen, narrowed, band-like, moderately sclerotized; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately long, slender, slightly taper to apex, without cornuti; sacculus with moderately dense setae basally sparse to medially, median with lobe on ventrobasal margin, projecting ventrally, with sparse, moderately strong spines from inner margin to outer margin, mixed with sparse setae; neck deeply incised ventrally; cucullus moderately long, slightly concave on inner margin, ventrobasally with small round lobe, dense long spine and spiniform setae, with short spines along outer margin, basally with distinct one long spine.

Female genitalia (Fig. 82.5): Sternum VII densely scaled, with large rounded lobe posteromedially, smooth margin, laterally connected with large triangular patch folded beneath sternum VII plate posterolaterally, projecting ventrally, with dense microtrichia on surface; tergum VIII with sparse setae posteriorly extended to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis forming inverted long tube, upper half portion tubular-like, lower half portion inverted cone-shaped, widened ventrally; ostium bursae rather narrow; colliculum absent; ductus seminalis arising from anterior 1/4 of ductus bursae; corpus bursae slightly sclerotized medially, without signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 12 Mar 2002 (1♂, genitalia slide NP294), 17 Jul 2003 (1♂, genitalia slide NP651), 20 Nov 2003 (1♂, genitalia slide NP652), 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂, genitalia slide NP380, 1♀, genitalia slide NP471), 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♂, genitalia slide NP653), 19 Feb 2004 (1♂, genitalia slide NP656).

Distribution. Thailand, Sri Lanka, Java, Borneo and New Guinea.

Remarks. Specimens were collected throughout the year at 180-745 m in mixed deciduous forest and hill evergreen forest.

Unplaced *Lobesia*

Lobesia sp. A
Figs. 11.2, 82.6

Description. *Head*: Lower frons white, upper frons orange white; labial palpus with first segment orange white, second segment light brown intermixed with a little diffuse dark brown spot with orange white apically, apical segment light brown with orange white apically; vertex greyish orange with orange white.

Thorax: Pronotal collar greyish orange with each scales light brown apically; tegulae basal half greyish orange to brownish orange mixed with dark brown, apical half orange white mixed with greyish orange, with brown spot; mesonotum greyish orange mixed with brown strip, posterior scales tuft brownish orange. Forewing (Fig. 11.2): length 5.22 mm in female (n=1), termen rounded, costal margin sinuate; ground color orange white; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin, present as irregular transverse striae, brown and dark brown intermixed with brownish orange; area between basal patch and median fascia with interfascial spot, grey extending from inner margin narrow to midwing surrounding by ground color; median fascia extending from costa to inner margin, dark brown mixed with brownish orange becoming paler to inner margin, distal margin extending diagonal to base of M_1 and extending inwardly to inner margin; pretornal subtriangular spot incompleted present as irregular dark brown striae, separated from median fascia by ground color, extending from inner margin to M_3; postmedian fascia present as dark brown spot on costa and R_3; ocellar region with large patch, greyish orange to brownish orange intermixed with diffuse dark brown spot extending from R_4

becoming paler to CuA_1, strigulae 9 with distinct narrow brown line extending from costa to outer margin, wing apex with suboval spot, brownish orange mixed with dark brown; outer margin with irregular dark brown striae. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, ventrally light brown.

Female genitalia (Fig. 82.6): Sternum VII slightly sclerotized, densely scaled; tergum VIII moderately dense setae on posterior margin extending to triangular latertal extensions; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis forming large, inverted longitudinal tube, dense short spines, slightly concave near basally, broad medially, slightly narrowed to top, basal margin concaved upward medially; ostium bursae moderately wide, with very short spines on anterior edge; antrum short, slightly sclerotized tube; ductus seminalis arising from near mid of ductus bursae; corpus bursae without signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 12 Dec 2003 (1♀, genitalia slide NP650).

Remarks. Speciemen was collected during the dry winter season at 255 m in dry evergreen forest.

Megalota Diakonoff, 1966

Megalota Diakonoff, 1966, Zool. Verh. Leiden 85: 52. Type species: *Polychrosis fallax* Meyrick, 1909

Megalota has been defined by the following characters; medium–sized brownish moth usually with an intricate wing-pattern characteristic for the genus: a large dark triangle on costa with its point drawn out and recurved towards termen and an inwardly oblique, comma-shaped mark in the terminal area. A dark transverse fascia including costal triangular and running to distal part of termen is developed in

several species. The labial palpi are rather stout and of only moderate length, and the male hind tibia in some species is enlarged by long dense scales concealing a tibial pencil. The male geniatlia with large hairy uncus of two separate square or curved-triangular flat lobe and the narrow valva with a very large club-shaped basal valval process are unique and diagnostic for the genus. The female genitalia with sterigma integrated with a strongly sclerotized distal part of the ductus bursae and lacks a sclerotized patch in lower part of ductus bursae, corpus bursae with only a single signum of at least two (Diakonoff, 1966, 1973). The genus includes 9 species worldwide. *Megalota* includes 3 species have been described from Southeast Asia (Brown, 2005).

Megalota fallax (Meyrick), 1909

Figs. 11.3, 39.1, 83.1

Polychrosis fallax Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 587. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. *Head*: Lower frons orange white, upper frons orange white to pale orange mixed with short scales, dark brown laterally; labial palpus with first segment orange white to pale orange, second segment orange white to pale orange, becoming darker to greyish orange apically, with two dark brown spots dorsally, apical segment greyish orange; vertex greyish orange.

Thorax: Pronotal collar greyish orange to brownish orange; tegulae greyish orange with dark brown spots basally, with transverse dark brown strip medially, apically light brown to brown with orange white apices; mesonotum brown to dark brown anteriorly, orange white to pale orange medially, dark brown posteriorly, posterior scales tuft orange white to pale orange. Forewing (Fig. 11.3): Length 5.73 mm in male (n=7); 5.45 mm in female (n=1); male costal fold absent, termen rather straight; ground color orange white to pale orange mixed with diffuse dark brown spots; costal strigulae orange white, strigulae 1 singled, strigulae 2-9 paired and separated by dark brown; basal fascia small between strigulae1 and wing base, area

between wing base and median fascia with irregular dark brown striae; median fascia fused with postmedian fascia forming as large patch, wide 1/3 of wing length, extending from costa between strigulae 4 and strigulae 7 to inner margin, dark brown intermixed with brownish orange scales ventral half, area between patch and outer margin with obliquely striae, brownish orange mixed with brown and dark brown; outer margin with distinct dark brown line, alternating with orange white spots, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, anal margin folded with group of scales tuft, orange white, ventrally light brown with scale-tufts on inner margin.

Male genitalia (Fig. 39.1): Tegumen broad, especially dorsally, with moderately dense scales anteromedially and along outer margin basal half; uncus bilobed, broad with dense spiniform setae, with sparse setae anteriorly; socii absent; gnathos indistinct; anellus closely surrounding near basal half of aedeagus; aedeagus large and moderately long, curved medially, enlarge basally, with two large and one small denticles dorsoapically, with one large and two small conuti, cornuti not deciduous; juxta triangular; sacculus with sparsely setose and group of dense spines medially, dorsal with long lobe, tubular, densely setose, with spines at apex; neck long and concave medially; cucullus long, apex rounded, densely setose, with group of spine ventrobasally.

Female genitalia (Fig. 83.1): Sternum VII densely scaled, sparsely setose; tergum VIII moderately scaled and sparse setae on triangular latetral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis developed, forming subtriangular split, large patch, with dense microtrichia, inner edge smooth, thickened, sclerotized; lamella antevaginalis reduced; ostium bursae with smooth rim; colliculum broad and moderately long near posterior 1/4 of ductus bursae, medially with long, split and thickened edge; ductus seminalis arising from junction between ductus and corpus bursae; corpus bursae with single signum, flat, bifid, with large basal plate.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 16 Aug 2002 (1♂, genitalia slide NP364), 22 Aug 2002 (1♀, genitalia slide NP363), 25 Oct 2003 (3♂, genitalia slide NP563), 23 Aug 2003 (1♂), 20 Nov 2003 (1♂), 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during rainy season to the early of winter season at 195 m in mixed deciduous forest.

Megalota vera Diakonoff, 1966

Figs. 11.4, 39.2

Megalota vera Diakonoff, 1966, Zool. Verh. Leiden 85: 54. Type locality: Bismarck Is. (New Hannover). Holotype (♂): BMNH.

Depscription. *Head*: Lower frons orange white, upper frons orange white to pale orange mixed with light brown to dark brown laterally; labial palpus with first segment white to orange white, second segment greyish orange with dark brown spot basally and dorsoapically, apical segment orange white to pale orange.

Thorax: Pronotal collar dark brown mixed with pale orange; tegulae orange white to pale orange, basal half with dark brown scales; mesonotum dark brown alternating with two transverse bands, orange white to pale orange, posterior scales tuft dark brown mixed with orange white to pale orange. Forewing (Fig. 11.4): Length 5.52 mm in male (n=6); male costal fold absent, termen slightly concaved between R_5 and M_2; ground color orange white mixed with diffuse dark brown straie; costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal patch with diffuse dark brown straie extending from costa between wing base and strigulae 3 to inner margin, interfascia with transverse line extending from costa between 3 and 4 to inner margin, dark brown; median fascia fused with postmedian fascia forming a large patch, wide 1/3 of wing length extending irregular from costa

between strigulae 4 and 7 to inner margin, brown mixed with dark brown; ocellus region between median patch and outer margin with obliquely striae extending to outer margin, brown mixed with dark brown; outer magin with distinct dark brown line, broken by orange white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with greyish orange spots on costa. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 39.2): Tegumen moderately broad, narrowed basally and widened toward dorsally, with moderately dense sclaes dorsoanteriorly and along outer margin; uncus bilobed, broad, dense spiniform setae, with sparse setae anteriorly; socii absent; gnathos arising from mid of tegumen, membranous, band-like; anellus closely surrounding basal half of aedeagus; aedeagus large and moderately long, tubular, with two large cornuti on sclerotized bases, not deciduous; sacculus with sparse setae apicobasally, ventromedially with group of dense spines, dorsal with long tubular lobe, projecting dorsally, sparse setae inner side and dense spiniform setae outer side, with two stout spines at apex; neck long, curved, with sparse setae; cucullus long, densely setose, with group of dense spines ventrobasally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Aug 2002 (1♂, genitalia slide NP382), 23 Aug 2003 (2♂), 14°39'10"N 98°36'29"E, 4 Oct 2002 (1♂, genitalia slide NP461), 14°40'03"N 98°36'07"E, 21 Sep 2003 (2♂, genitalia slide NP569).

Distribution. Thailand, New Guinea, Bismark Is., Bali Is. Moluccan Is. and Australia.

Remarks. Specimens were collected during the rainy season at 180-220 m in mixed deciduous forest.

Neohermenias Diakonoff, 1966

Neohermenias Diakonoff, 1966, Zool. Verh. Leiden 85: 73. Type species: *Hermenias scoliomelas* Diakonoff, 1953.

Neohermenias has been defined by the following characters; antenna with scape considerably elongate, flagellum in male slightly flattened, basal part straight, somewhat thickened, with a shallow notch on dilatation above, flagellum rather slender from beyond this notch to apex. Labial palpus moderately long, mostly gradually curved downwardly, subascending or ascending, terminal segment slender, of varying length. Forewing with costal fold in male which is mostly strong and concealing long, dense white hairs. The male genitalia with tegumen, broad, short, uncus small, represented by a slender bifid projection or by two curved horns. Socii a large, thickened, rounded pad, densely covered with rising bristles. Valva narrow, strongly constricted in the middle, cucullus curved downward, semiovate, truncate or asymmetrical, bristled, dentate along edge. Anellus very strong, erect. Aedeagus mostly moderate, curved, hinged to apex of anellus. In female genitalia characterized by sterigma, a broad median plate of varying shape, forming a good characteristic for discrimination of species. Ductus bursae moderate, corpus large, spheroid, clothed with fine needles. Signa absent (Diakonoff, 1966). The genus includes 26 species worldwide. *Neohermenias* includes 25 species have been described from Southeast Asia (Brown, 2005).

Neohermenias thalassitis (Meyrick), 1910

Figs. 11.5, 39.3

Spilonota thalassitis Meyrick, 1910, Trans. Ent. Soc. Lond. 1910: 434. Type locality: Indonesia (Java, Bangdong). Lectotype (♂): BMNH.

Description. *Head*: Antenna with notch on flagellum base. Lower frons dark brown, upper frons white; labial palpus with first segment white, second segment dark

brown with white spot dorsoapically, apical segment white, vertex white with row of dark brown scales posterior to eyes.

Thorax: Pronotal collar dark brown; tegulae white with dark brown basal 1/5; mesonotum white with dark brown posterior half, with white spot posterior end. Forewing (Fig. 11.5): Length 6.04 mm in male (n=1); male costal fold present extending from wing base to strigulae 7, and from costa to R vein; termen slightly concave between wing apex and M_3, ground color white, strigulae 1-6 indistinct, strigulae 7-9 paired and separated by dark brown; basal fascia extending from costa to inner margin with large white spot medially; costal fold area, dark brown, connected with dark brown rhomboidal-shaped spot posteriorly, inner margin with subquadrate spot, dark brown near medially extending from inner margin to CuA_2; subtriangular pretornal spot, dark brown extending from inner margin to M_3; ocellus region absent; wing apex dark brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown, with costal fold area dark brown, with white to yellowish spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 39.3): Tegumen narrowed, widened apically, with moderately dense scales on outer margin; uncus very short, small triangular lobe, dense scales basoposteriorly; socii moderately long, strongly sclerotized, arising from base of uncus, inner margin oblique, flattened, from base to apex, sparsely setose, apex rounded; gnathos arising from near half of tegumen, widened band-like, moderately sclerotized; caulis widened; anellus surrounding basal of aedeagus, lateral and basal opening; aedeagus moderately long, slender, curved medially; cornuti socket difficult to defined; valva long, slender, curved medially forming long neck; sacculus with moderately dense setae and spiniform setae from ventrobasally to ventromedially, median with short, sparse setae between basal opening and neck, dorsal with sparsely long setose; neck with sparse setae; cucullus short, apically large, widened, apex rounded, dense spines and spiniform setae, outer margin with three distinct moderately long, strong spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP441).

Distribution. Thailand (new record) and Java.

Remarks. Specimen was collected during the summer season at 935 m in hill evergreen forest.

Unplaced *Neohermenias*

Neohermenias sp. A

Figs. 11.6, 83.2

Description. *Head*: Lower frons white, upper frons white to yellowish white; labial palpus with first segment white with dark brown spot dorsally, second segment dark brown with white brown patch dorsoapically, apical segment white; vertex white to yellowish white with row of dark brown scales posterior to eye.

Thorax: Pronotal collar dark brown; mesonotum with greyish yellow mixed with yellowish white anterior haft, posterior half dark brown, tegulae with dark brown basal 1/3. Forewing (Fig. 11.6): Length 7.27 mm in female (n=1); termen slightly concave between wing apex and M_3; ground color white to yellowish white, costal strigulae white, strigulae 1-9 single; basal patch distinct extending from wing base to strigulae 1 and from costal to inner margin, with large white spot medially; subbasal fascia distinct dislocated extending obliquely from costa to between R vein and CuA_2 and extending to discal cell posterior end, dark brown, with large subquadrate spot, dark brown on inner margin separated from upper part by ground color; median fascia distinct on costa present as semicircular spot, dark brown, with subtriangular pretornal spot, dark brown, and between wing base to median fascia and from strigulae 4 extending oblique to tornus with ground color pale yellow to greyish yellow; outer marginal area with dark brown strip extending from wing apex to tornus, curved inward medially; outer margin with white strigulae between R_5 and M_1 , M_1 and M_2,

M_2 and M_3. Underside light brown mixed with brown, with dark brown on costal dorsobasally, with white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 83.2): Sternum VII with large sclerotized plate, densely scaled and microtrichiate except two lateral areas, anterolateral areas with single small spine on each side, posterior margin slightly concave medially and incised laterally forming two round lobes; tergum VIII posteriorly with moderately dense scales, and dense microtrichia, triangular lateral extensions with dense scales and microtrichia; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis forming large transverse band, slightly sclerotized, fused laterally with sternum VII; lamella antevaginalis reduced; antrum cup-like, sclerotized, opening widened posterolaterally; ductus bursae with median 1/3 encircled by large sclerotized plate; ductus seminalis arising from anterior 1/3 of ductus bursae; corpus bursae with two small signa, blade-like, bases rounded.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♀, genitalia slide NP162).

Remarks. Specimen was collected during the winter season at 1,020 m in montane evergreen forest.

Neopotamia Diakonoff, 1973

Neopotamia Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 296. Type species: *Neopotamia leucotoma* Diakonoff, 1973.

Neopotamia has been defined by the following characters; elongate-subtruncate or subtriangular wing-shaped, termen gently round, a long appressed tufts between bases of antennae. Antenna minutely ciliated in male and female. Labial palpus rather long, subascending, gently sinuate, median segment gradually dilated towards apex. Hind tibia moderately dilated with dense scales, flattened

dorsoventrally, upper edge with moderate appressed scales, without a pencil of hairs from base. In male hindwing, dorsum with edge slightly folded over and thickened, with upper surface impressed longitudinally and forming a shallow trench filled with short, modified scales. The male genitalia with group of long and strong spines on a top of a long process, originating from the ventral edge of valva, but curved across disc towards its dorsal edge. Valva slender and sinuate, uncus single and slender, socii large or very large, triangular or quadrate, pending. Gnathos, a broad transverse membrane with a median split. The female genitalia with rather large sterigma, semi-spheroid or trapezoid, aciculate or granulate, a diversely shaped median vertical split, below dilated into the ostium. Colliculum moderate, subcylindrical. Ductus and corpus bursae simple, with two signa, large irregular, flattened, sclerotized, each with semioval dark ridge (Diakonoff, 1973). The genus includes16 species worldwide. *Neopotamia* includes 8 species have been described from Southeast Asia (Brown, 2005).

Neopotamia cathemacta Diakonoff, 1983

Figs. 11.7, 40.1

Neopotamia cathemacta Diakonoff, 1983, Zool. Verh. Leiden 204: 53. Type locality: Indonesia (Sumatra, Mt. Bandahara, Bivouac One). Holotype (♂): RMNH.

Description. *Head*: Lower frons white; upper frons greyish orange; labial palpus with first segment white; second segment with white to orange white basal half, apical half greyish orange, apical segment greyish orange; vertex greyish orange mixed with orange red.

Thorax: Pronotal collar reddish orange mixed with orange red; tegulae basal half greyish orange mixed with reddish orange and orange red, apical half greyish orange mixed with white to orange white; mesonotum orange to greyish orange intermixed with pale orange; posterior scales tuft orange white. Forewing (Fig. 11.7): Length 8.31 mm in male (n=1); male costal fold absent; termen rather straight; ground color greyish orange mixed with pale orange; costal strigulae white, strigulae 1-9

paired and separated by dark brown wing with large patch extending from wing base to apex and from costa to CuA_2, dark brown intermixed with brownish red, fasciae indistinct, suffused, present as brownish red striae on costa, between R_5 and M_1 with subtriangular patch, white mixed with greyish orange, area between CuA_2 to inner margin greyish orange intermixed with pale orange, inner margin basally with patch dark brown mixed with brownish red, strigulae 3-8 with grey striae; outer margin with distinct brownish red line broken by white strigulae between M_1 and M_2. Underside brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin folded, sclerotized, with group of dense hair pencils on anal area near wing base, ventral light brown with long, white hair pencils on anal area. Hindtibia with dense scales tuft, long groove like surrounding short, white scales on tibia dorsally, with dense orange white hair pencil on tibia, inner marginal posterior half, curved, metatarsus with grey scales tuft dorsally.

Male genitalia (Fig. 40.1): Tegumen high, rather narrowed, basoanteriorly with small round lobe, moderately dense scales on outer margin; uncus large, long, triangular, bifided at apex, with dense long setae basal 2/3; socii round lobe, rather small, densely setose; gnathos arising from midlength of tegumen, widened band–like, slightly sclerotized; anellus surrounding basal 1/3 of aedeagus; aedeagus wide and short, with dense cornuti; sacculus with sparse setae basally and along ventral margin, dorsal with tubular lobe, moderately long, slightly tapered to apex, apex rounded, dense short spines, with small group of very short setae basolaterally; valva concave ventrally forming neck, moderately dense setae dorsally; cucullus long, slender clavate, apex rounded, dense spines mixed with sparse setae, except apical 1/4 with dense setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'20"E, 9 Jan 2002 (1♂, genitalia slide NP126), 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♂, genitalia slide NP223).

Distribution. Thailand (new record) and Indonesia.

Remarks. Specimens were collected during the winter season at 1,020-1,040 m in hill evergreen forest.

Neopotamia formosa Kawabe, 1989

Figs. 11.8, 40.2, 40.3

Neopotamia formosa Kawabe, 1989, Microlepid. Thailand 2: 39. Type locality: Thailand (Nakhon Nayok, Khao Yai). Holotype (♂): OPU.

Description. *Head*: Upper frons pale orange to greyish orange, lower frons orange white; labial palpus with first segment white, second segment white to orange white mixed with spot, dark brown mixed with brownish red basomedially, with light brown scales ventroapically, apical segment pale orange; vertex greyish orange.

Thorax: Pronotal collar greyish orange; tegulae light brown mixed with brown, with greyish orange apically; mesonotum greyish orange to brownish orange mixed with brown. Forewing (Fig. 11.8): Length 6.68 mm in male (n=1); male costal fold absent; termen rounded, ground color orange white intermixed wih greyish orange with diffuse lines along inner margin, light brown to brown; costal strigulae white, strigulae 1-4 indistinct, strigulae 5-9 paired and separated by brownish red, costal half of wing pale red to pastel red from base to strigulae 4, strigulae 5-9 connected to apically directed, pastel red streaks separated by streaks of orange enclosing by browinsh red, apical 1/4 of wing suffused with orange mixed with orange red, area between midwing and Cu orange red, area between Cu to inner margin orange white intermixed with greyish orange, two silvery striae present at tornus between CuA_2 and inner margin; outer margin with distinct brownish red line, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally with triangular lobe on tornus, inner margin forming sclerotized, folded with long brown hair pencils on anal area, ventral light brown with dense light brown hair pencils mixed with dense white scales tuft on triangular lobe apically. Hindtibia on inner margin with dense brown scale-tufts dorsally, white

medially and yellowish white posteriorly, mixed with dense light brown hair pencils ventrally and group of dense pale orange.

Abdomen (Fig. 40.3): Sternum III with group of dense, long hair-like scales laterally.

Male genitalia (Fig. 40.2): Tegumen moderately broad, basoanterior margin extended as round lobe, dense scales along outer margin; uncus large, long 2/3 of tegumen length, apex rounded, dense long setae; socii moderately large, pendant from base of uncus, moderately dense setae; gnathos arising from midlength of tegumen, broad band, slightly sclerotized; anellus surrounding basal 1/4 of aedeagus; aedeagus rather short, widened, with small, dense cornuti; juxta trapezoid; sacculus with group of sparsely setose basally, posterolateral surface of sacculus with rows of two groups of setae extending from sacculus to neck, lower group with long setae, upper group shorter, basal opening margin with small lobe medially, modeately dense setae, dorsal with moderately large lobe, with moderately dense spines mixed with setae; neck deeply incised ventrally; cucullus broad, moderately dense strong spines, with dense setae apically, sparse setae along outer margin, ventrobasally with pointed lobe, projecting ventrally, with short, stout spines at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 22 Oct 2003 (1♂, genitalia slide NP581).

Distribution. Thailand and Taiwan.

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Unplaced *Neopotamia*

Neopotamia sp. A

Figs. 12.1, 40.4

Description. *Head*: Lower frons orange white, upper frons greyish orange; labial palpus with first segment orange white, second segment greyish orange mixed with brownish orange, orange white ventrobasally and dark brown ventroapically, apical segment brownish orange; vertex light brown mixed with dark brown.

Thorax: Pronotal collar brownish orange to light brown; tegulae basal half dark brown mixed with greyish orange to greyish red, apical half light brown to dark brown, some scales with orange white apices; mesonotum light brown with brown anteriorly and dark brown posteriorly. Forewing (Fig. 12.1): Length 5.54 mm in male (n=1); male costal fold absent, termen slightly concaved between R_5 and M_2; ground color and costal strigulae orange white, strigulae 1-2 and 5-6 singled, strigulae 3-4 and 7-9 paired and separated by dark brown, basal 4/5 of wing length with large patch, brown to dark brown mixed with brownish red from R to inner margin, dorsal 1/3 between costa and R with reddish white mixed with reddish brown; median fascia fused with postmedian fascia forming patch, extending obliquely from costa slightly narrowed to outer margin at between M_2 and M_3, reddish brown mixed with dark brown, wing apex dark brown, strigulae 7 with irregular silvery strip extending obliquely to outer margin; ocellus region with irregular silvery spots between M_2 and tornus; outer margin with distinct dark brown line, broken by orange white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally. Hindtibia with hair pencils, long 1/2 of tibia length, greyish orange.

Male genitalia (Fig. 40.4): Tegumen with arms, rather narrowed, densely scales laterally; uncus long, large, curved, bifided over apical half, with long armed, rounded at apex, dense short spines and sparsely setose; socii large, long, apex rounded, arising from base of uncus, pendant to tegumen basally, densely scaled and sparsely setose; gnathos indistinct; anellus closely surrounding basal 1/4 of aedeagus, basal opening; aedeagus rather short, moderately widened, sparsely denticulated dorsoapically; cornuti absent; sacculus with lobe, rhomboidal-shaped, on basal opening margin apicomedially, sparsely setose, becoming more dense towards apical

margin, with group of dense spines dorsoapically, median densely setose, with group of dense, long spines on flattened surface near neck; neck indistinct; cucullus as long as sacculus, slightly flattened and narrowed, inner margin densely long setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♂, genitalia slide NP607).

Remarks. Specimen was collected during the winter season at 740 m in hill evergreen forest.

Olethreutes Hübner, 1822

Olethreutes Hübner, 1822, Syst.-alphab. Verz.: 72. Type species: *Phalaena arcuella* Ckerck, 1759.

Phiaris Hübner, [1825] 1816, Verz. Bekannter Schmett.: 381. Type species: *Tortrix micana* [Denis & Schiffermüller, 1775].

Roxana Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 118. Type species *Phalaena arcuella* Clerck, 1759.

Mixodia Guenée, 1845, Annls. Soc. Ent. Fr. (2) 3: 160. Type species: *Pyralis schulziana* Fabricius, 1776.

Exartema Clemens, 1860, Proc. Acad. Nat. Sci. Philad. 12: 356. Type species: *Exartema nitidana* Clemens, 1860.

Biscopa Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 492. Type species: *Pyralis bipunctana* Fabricius, 1794.

Olethreutes has been defined by the following characters; head with appressed, rather short scales, antenna in male rather ciliated. Labial palpus ascending close to face, median segment curved, with loosely appressed long hair-scales, terminal segment slender, porrected. Posterior tibia with normal, smoothly appressed scales, only above slightly raised, a slender pencil in shallow groove from base submedially. Forewing with a slender, marginal-rolled dorsum. The male genitalia with sacculus thickened, mostly strong corrugated, with a deep internal concavity and an other external concavity opposite this, separated from each other by a sinuate ridge or keel, from ventral edge towards base crossing to costa of valva near base of cucullus, this keel with strong unequal spines at one or both extremities, ventral edge of sacculus sometimes with a digitoid moderate process, spiny on top, located either at base, in middle or at top of marginal concavity of sacculus, sacculus edge seldom strongly prominent and seldom with a large rigid column-like median process. The female genitalia with diversely shaped of sterigma, usually with a large sclerite with lateral tumescences, above forming more or less pointed projections. Signum, a small scobination, or absent (Diakonoff, 1973). The genus includes 149 species worldwide. *Olethreutes* includes 2 species have been described from Southeast Asia (Brown, 2005). *Morus alba* L. were reported for host plant of *O. mori* in Diakonoff (1973).

Unplaced *Olethreutes*

Olethreutes sp. A

Fig. 41.1

Description. Wing pattern poorly defined.

Male genitalia (Fig. 41.1): Tegumen subtriangular, with arms broad, moderately dense scales laterally; uncus reduced as rounded lobe at apex, densely setose; socii present as subtriangular lobe-like, arising from tegumen apicolaterally, densely setose; gnathos arising from midlength of tegumen, completed band-like, moderately widened, weakly sclerotized; caulis short; anellus surrounding basal half

of aedeagus, cup-like; aedeagus short; cornuti absent; valva long; sacculus with group of dense setae on ventral margin, median with dense spiniform setae, moderately long; neck with anterior surface deeply incised; cucullus long, concaved medially, forming two portions, basal portion with ventral surface deeply concaved, basoposterior part subrectangular, dense long and short spines, basoanterior part large, with small lobe of dense, long spiniform setae, apical portion subovate, elongate, with dense, long spiniform setae, outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 1 Oct 2002 (1♂, genitalia slide NP554).

Remarks. Specimen was collected during the late of rainy season at 950 m in hill evergreen forest.

Ophiorrhabda Diakonoff, 1966

Ophiorrhabda Diakonoff, 1966, Zool. Verh. (Leiden) 85: 47. Type species: *Argyroploce ergasima* Meyrick, 1911.

Cellifera Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 47. Type species: *Polychrosis cellifera* Meyrick, 1912.

Lasiognatha Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 429. Type species: *Lasiognatha quartaria* Diakonoff, 1973.

Didrimys Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 388. Type species: *Platypeplus harmonica* Meyrick, 1905.

Ophiorrhabda Has been defined by the following characters; medium-sized, usually intricately marked greyish or brownish moths, often with a reddish tinge and with a slender triangular dark mark or a band parallel to termen rising from end of dorsum, sometimes with a conspicuous large round blotch below middle of costa.

Labial palpi moderately long, sinuate, with the second segment apically slightly dilated. The tibia and first tarsal segment in male hind leg are enlarged by scales and hair pencil. The anal margin is folded over the upper surface producing either a thickened anal roll with dense long scales or a deep fold containing a hairpencil. A pair of deep round depression laterally on abdominal segment 2 in both sexes are characteristic feature of the genus. The male genitalia are characterized by a well-developed, ventrally bristled uncus, drooping socii, a membranous gnathos with two separate bristled pads each ending in a dorsal point and a slender valva with an isolated group of short sharp spines on margin of basal excavation. The medially separated spinulose gnathos pads are diagnostic for *Ophiorrhabda*. The female genitalia with spinulose sterigma laterally continued into a short, angled ridge on each side, the ventrally split, rim-shaped. The large horn-shaped single signum with its hollow base and flat apex are both diagnostic for the genus. The genus includes 13 species worldwide. *Ophiorrhabda* includes 9 species have been described from Southeast Asia (Brown, 2005). Fletcher (1932) and Diakonoff (1973) reported numerous host records for several species. They all refer to leaf rolling or boring in fruit or stem galls on Myrtaceae, mostly on several species of *Eugenia* L., but also on *Psidium guajava* L. and *Jambosa vulgaris* DC. Another host plants recorded are *Nephelium lappaceum* L. (Sapindaceae) and *Bauhinia* L. (Caesalpinaceae).

Ophiorrabda mormopa (Meyrick), 1906

Figs. 12.2, 41.2, 83.3

Platypeplus mormopa Meyrick, 1906, J. Bonbay Nat. Hist. Soc. 17: 136. Type locality: Ceylon [Sri Lanka] (Maskeliya). Lectotype (♂): BMNH.

Olethreutes melanoclyca Common, 1970, in Waterhouse, Insect Australia: 799. [nomen nudum].

Description. *Head*: Lower frons white mixed with brown, upper frons light brown to brown mixed with white: labial palpus with first segment white, second

segment brown intermixed with dark brown, apical segment brownish orange; vertex orange white intermixed with dark brown scales.

Thorax: pronotal collar light brown to brown with each scales orange white apices; tegulae brown mixed with dark brown with each scales white at apices; mesonotum brown to dark brown with each scales white at apices. Forewing (Fig. 12.2): Length 7.27 mm in male (n=4), 7.57 mm in female (n=3); male costal fold absent; termen rounded, ground color white to orange white intermixed with diffuse brown scales, basal fascia indistinct as diffuse dark brown striae from costa to inner margin; median fascia incompleted, extending distinct between costa and CuA_2, rhomboidal- shaped, dark brown, apical 1/4 of wing with sinuate irregular strip between R_4 and tornus, dark brown, with sinuate narrow line beyond irregular strip extending from R_4 to tornus, both strip surrounding by white to orange white scales; outer margin with distinct dark brown striae broken to white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, inner margin forming sclerotized with groove dorsally with dense orange white scales near wing base, ventral light brown. Hindfemur with group of narrow scales orange white, raised upwardly; tibia with dense orange white scales tuft dorsally extending from base to mid of tibia; with dense brownish orange beneath extending from base to end of tibia.

Male genitalia (Fig. 41.2): Tegumen high, rather narrow, moderately dense scales laterally; uncus slightly hooked, moderately long and wide, constricted basally and near apex, widened medially, dense long setae, apex dilated with two groups of dense, moderately long spiniform setae; socii arising from base of uncus, moderately long, apically rounded, densely setose; gnathos arising from midlength of tegumen, transverse band-like, large sclerotized lobe medially, dense short tiny spines; anellus surrounding basal 1/3 of aedeagus; aedeagus rather short; cornuti absent; valva long and slender, moderately incised medially, forming narrow neck; sacculus with group of setae basally and ventrobasally, median with small rounded lobe on basal opening margin, moderately dense short spines apically, dorsal with moderately dense setae; cucullus long, apex rounded, dense spines mixed with spiniform setae.

Female genitalia (Fig. 83.3): Sternum VII concave medially, densely scaled, sparsely setose; tergum VIII sparsely setose, triangular lateral extensions sparse setae with dense scales apically; papillae anales densely setose, lateral setae with papillose bases; sterigma reticulated, with lateral large horn-shaped, dense short spines; lamella antevaginalis fused with lamella postvaginalis forming ring, disconnected anteromedially, with dense, very short tiny spines, posterior margin rounded lobe, with dense microtrichia, anterior margin forming small, thickened rounded lobe, lateral with extended edge; ostium bursae with dense microtrichia on margin; colliculum narrowed, short; ductus seminalis arising from near anterior 1/3 of ductus bursae; corpus bursae with large single signum, long, blade-like, one margin dentate.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 5 Jan 2002 (2♂, genitalia slide NP124, NP136), 14°41'34"N 98°24'06"E, 9 Mar 2002 (1♂, genitalia slide NP277), 14°41'30"N 98°24'17"E, 13 Jun 2002 (1♀, genitalia slide NP466), 14°34'01"N 98°27'28"E, 19 Jun 2002 (2♀), 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♂).

Distribution. Thailand, Philippine Is., India, Sri Lanka, Sumatra, Borneo and Celebes.

Remarks. Specimens were collected during the winter season and summer season at 740-1,040 m in hill evergreen forest.

Ophiorrhabda philocompsa (Meyrick), 1921

Figs. 12.3, 41.3

Argyroploce philocompsa Meyrick, 1921, Zool. Meded. 6: 158. Type locality: Indonesia (Java, Buitenzorg). Holotype (♂): RMNH (lost).

Description. *Head*: Lower frons white mixed with light brown, upper frons light brown to brown with white apices; labial palpus with first segment white to

orange white, brown ventrally, second segment brown, with white basally, dorsomedially and apically, apical segment white; vertex brown to dark brown, with white apices.

Thorax: Pronotal collar brown to dark brown with white apices; tegulae dark brown mixed with pale orange and brownish orange 1/3 basally, white to orange white medially, apically light brown to brown with white apices; mesonotum with transverse strip, dark brown alternating with white strip. Forewing (Fig. 12.3): Length 6.40 mm in male (n=2), male costal fold absent, termen round; ground color white to orange white, costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch distinct on costa from wing base to strigulae 3, extending irregular to inner margin, light brown to dark brown mixed with orange red to brownish red; median fascia distinct extending from costa between strigulae 4 and 5 to inner margin, brown to dark brown dorsal half, basal half light orange, area between median fascia and outer margin with cresent-shaped between R_4 and CuA_1, brownish red intermixed with dark brown, and irregular striae, brownish red from M_1 to tornus, pretornus with patch extending from tornus to M_3; outer margin with distinct brownish red intermixed with dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2. Underside light brown with white spots on costa and outer margin between veins. Hindwing brown dorsally, with moderately long hair pencils, black in narrow groove near anal margin, ventrally light brown. Hindtibia with long hair pencils dorsobasally, white.

Male genitalia (Fig. 41.3): Tegumen moderately wide, with dense scales from mid to near dorsal of tegumen; uncus subtriangular, broader at base, dense scales, top curved projecting posteriorly, with a deep median split, with single spine medially, each half at tip with two strong spines; socii pendant from base of uncus to dorsal 1/3 of tegumen, apically rounded, with moderately dense setae; gnothos slightly sclerotized, band-like, moderately wide, with dense microtrichia, dorsal part formimg two horns, sclerotized, pointed apex projecting dorsally, sparsely microtrichiate basally; juxta triangular; anellus surrounding basal 1/3 of aedeagus; aedeagus moderately long and wide, indistinct cornuti; sacculus with group of moderately dense

setae basally, with group of sparse setae along ventrobasal margin, basal opening with small lobe, with group of short, moderately dense setae, dorsoapically to neck with row of sparse setae; neck slightly excavated; cucullus narrow, with dense, short spines mixed with setae, ventrobasally with small lobe, densely short spines, rounded apex with dense setae apically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°42'63"N 98°23'56"E, 11 Mar 2002 (1♂, genitalia slide NP288), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP583).

Distribution. Thailand and Java.

Remarks. Specimens were collected during the winter season and the summer season at 255-1,000 m in dry evergreen forest and hill evergreen forest.

Penthostola Diakonoff, 1978

Penthostola Diakonoff, 1978, Zool. Meded. 52: 261. Type species: *Argyroploce hemeronyx* Diakonoff, 1953.

The genus includes 6 species worldwide. *Penthostola* includes 5 species have been described from Southeast Asia (Brown, 2005).

Penthostola albomaculatis (Liu & Bai), 1985

Figs. 12.4, 42.1

Eudemis albomaculatis Liu & Bai, 1985, Sinozoologica 3: 137. Type locality: China (Yunnan Province, Mengla). Holotype (♂): IZAS.

Description. *Head*: Upper frons dark brown to black, lower frons dark brown to black intermixed with white; labial palpus with first segment white, second segment

white with dark brown to black apically, apical segment dark brown; vertex dark brown mixed with white to orange white laterally.

Thorax: Pronotal collar pale orange to light orange; tegulae orange white mixed with greyish orange, with brown spot apically; mesonotum anterior half dark brown intermixed with greyish orange, posterior half white with posterior scales tuft, dark brown mixed with white medially. Forewing (Fig. 12.4): Length 7.16 mm in male (n=4); male costal fold absent, termen straight; ground color difficult to defined, costal strigulae white, strigulae 1-4 paired and separated by dark brown, striugulae 5-9 singled; basal patch with interfascia suffusion extending from wing base to strigulae 4 and from costa to 1A+2A, brownish orange to light brown; median fascia extending from costa to inner margin suffused with basal patch on inner margin, dark brown, in area of median fascia on inner margin with dorsum large, subtriangular patch, white, some specimens with diffuse dark brown spot, extending from inner margin to Cu, strigulae 5 and 6 with grey striae extending to CuP; postmedian fascia extending from costa to inner margin near tornus; strigulae 7-9 without striae; tornus with subtriangular spot, brownish orange to light brown extending from tornus to M_2, area between postmedian fascia and outer margin suffused with dark brown; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside light brown with white spots on costa and outer margin

Male genitalia (Fig. 42.1): Tegumen high, moderately broad, swollen apically, dense scales apicoanteriorly and along outer margin; uncus short, present as round lobe, with dense scales dorsoposteriorly; socii long, curved medially, round at apex, densely setose, pendant to dorsal 1/3 of tegumen length; gnathos arising from dorsal 1/3 of tegumen, sclerotized, band-like; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately long, curved medially, slightly taper to apex, without cornuti; sacculus longer than cucullus, with group of moderately dense setae basally, ventrobasal margin with sclerotized flat, large lobe bearing long, dense spiniform setae, dorsal with large lobe, with group of short, strong and stout spines; neck rather short, concaved with moderately dense setae from sacculus dorsally towards neck; cucullus moderately long, widened, apex rounded, dense spines, ventroapically with

short, stout spines, slightly longer to basally towards neck, ventrobasally with lobe containing group of long and curved spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♂, genitalia slide NP218), 14°41'40"N 98°24'11"E, 7 Feb 2002 (1♂, genitalia slide NP206), 14°41'43"N 98°24'34"E, 5 Nov 2002 (1♂), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂).

Distribution. Thailand and South China.

Remarks. Specimens were collected during the winter season at 935-1,020 m in hill evergreen forest.

Phaecadophora Walsingham, 1900

Phaecadophora Walsingham, 1900, Ann. Mag. Nat. Hist. (7) 6: 130. Type species: *Phaecadophora fimbriata* Walsingham, 1900.

Phaecadophora has been defined by the following characters; head with appressed scales, roughly spreading on vertex. Antenna in two sexes short-ciliate. Labial palpus porrected, sinuate. Posterior tibia in male normal or strongly dilated with dense scales above and beneath, compressed laterally, its apex on the inside forming a cavity, male tarsus sometimes strongly dilated by dense scales above, equally compressed, basal joint dilated, concave and clothed with very short scales on the inner side. Abdomen in male normal or with sternum 5 and 6 with a scent organ, being to submedian dense brush of scales. Forewing oblong-suboval, costa moderately curved throughout, apex obtusely pointed, termen gently concave, dorsum in male not modified or modified and with a scent organ, being a narrow fold along margin on underside, followed by a deeper and wider thickened fold on the upperside, clothed with smooth modified scales, fold fits the long pencil. The male genitalia with a high-triangular tegumen and a slender hooked uncus with bristles under the top. Socii pending, moderate, heavily bristled, gnathos membranous and very weak. Valva

robust, sacculus sinuate and naked, cucullus bristles forming a strong and straight transverse ridge, cucullus slightly sinuate, pointed, bristly, aedeagus extremely short. The female genitalia with a tubular ostium, lamella postvaginalis forming a semicircular cap over ostium. Colliculum strongly sclerotized, abruptly narrowed below. Signa peculiar, of modified scobinate type (Diakonoff, 1973). The genus includes 2 species worldwide that have been described from Japan (Brown, 2005).

Phaecadophora fimbriata Walsingham, 1900

Figs. 12.5, 42.2, 83.4

Phaecadophora fimbriata Walsingham, 1900, Ann. Mag. Nat. Hist. (7) 6: 130. Type locality: Japan (Kyushu, Satsuma [Kagoshima Prefecture]). Lectotype (♂): BMNH.

Argyroploce metactenis Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 597. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Argyroploce eucrossa Meyrick, 1914, Suppl. Ent. 3: 49. Type locality: Formosa [Taiwan]. Holotype (♂): DEIB.

Argyroploce eaolotechna Meyrick, 1935, in Caradja & Meyrick, Mat. Microlepid. Fauna Chin. Prov.: 60. Type locality: China (Kiangsu Province, Lungtan bei Nanking). Lectotype (♂): MGAB. [original misspelling of *aeolotechna*].

Argyroploce leucocteis Diakonoff, 1953, Verh. Konin. Neder. Akad.Weten. (2) 49: 112. Type locality: New Guinea (Moss Forest Camp, 5 km NE Lake Habbema). Holotype (♂): RMNH.

Description. *Head*: Lower frons white to yellowish white; labial palpus with first segment white to yellowish white, second segment white, ventrobasally mixed with dark brown spot dorsomedially and light brown apically, apical segment with

yellowish grey basally, light brown apically; vertex light brown intermixed with dark brown.

Thorax: Pronotal collar brown; tegumen brown mixed with light brown, mesonotum light brown to brown. Forewing (Fig. 12.5): Length 8.62 mm in male (n=5), 8.72 mm in female (n=1); male costal fold absent; ground color and costal strigulae yellowish white; strigulae 1-2 and 5-9 paired and separated by dark brown, strigulae 3 and 4 two paired and separated by dark brown; subbasal fascia indistinct extending from costa between strigulae 2 and 3 to Sc; basal patch absent; median fascia indistinct extending diagonally from costa between strigulae 4 and 5 to R_4; postmedian fascia indistinct extending confluent with terminal fascia diagonally from costa between strigulae 6 and 7 to outer margin, grey striae present as long narrow line near costal strigulae, extending from the middle of wing to outer margin between R_5 and M_1, longitudinal line, dark brown between longitudinal vein extending from the base of wing to the base of R_5 to CuA_2; ocellus region with longitudinal lines, dark brown between R_4 and CuA_2, outer marginal scales dark brown, except marginal strigulae between R_4 and R_5 , R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside with triangular patch, dark brown on dorsum margin, light brown to brown, with greyish yellow spots on costa. Hindwing light brown dorsally with group of hair pencils between CuA_1 and CuA_2, extending from midwing to near outer margin; anal margin modified by thickened membrane to form narrow groove, two types of sex scales present near the base between 1A+2A and anal margin, one small grey short, dark brown to black basal half, apical half brown by apex insert into the narrow groove, other one large group longer, yellowish white to pale yellow over basal half, apically brown, extending to outer margin ventrally light brown with group of hair pencil, white to yellowish white, on 1A+ 2A. Hindfemur with scales tuft, white to yellowish white, extending from near base to over the base of tibia, one group of scales tuft, basal half white to yellowish white, apical half dark brown, arising form the one of femur over tibia; tibia with group of scales tuft, one white to yellowish white mixed with brown and dark brown, extending curved upwardly from inner margin ventrally, other one dorsally, longer with white to yellowish white mixed with dark brown, slightly curved.

Male genitalia (Fig. 42.2): Tegumen high moderately wide with sclerotized lobe anteriorly, basal 1/3 densely setose; uncus developed, anteriorly long and curved, bilobed, pointed at apex, densely setose; socii reduced as small plates at base of uncus, densely setose; gnathos arising from 1/3 of tegumen length dorsally, large band connected, anellus not closely surrounding at base of aedeagus, cup-like, aedeagus moderately long, curved, cornuti absent; juxta triangular, truncated ventrally; valva with moderately setose at base of sacculus and along ventral margin, medially of sacculus with cluster of moderately setose on ventral margin, apically with sparsely setose; neck slightly incised with setae on dorsal and ventral margin; cucullus large with lobe, rounded apically with dense spiniform setae, projection from dorsobasal margin, base with large projecting ventrally, with group of long setae apically and moderately stout spines laterally, cucullus with dense spines and setae.

Female genitalia (Fig. 83.4): Sternum VII with large, sclerotized plate, posterior margin concaved medially, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; sterigma sclerotized, lamella antevaginalis fused with lamella postvaginalis laterally forming moderately large, sclerotized lobe laterally, not encircled, narrow posterolaterally, densely microtrichiate; ostium bursae ovate, colliculum long and narrow; ductus bursae long with inception of ductus seminalis at over anterior 1/3; corpus bursae with two unequal signa, widened and rounded cup-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (3♂, genitalia slide NP402), 14°41'39"N 98°24'10"E, 19 Apr 2002 (1♂, genitalia slide NP328), 14°41'43"N 98°27'34"E, 15 May 2002 (1♂), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♀, genitalia slide NP755).

Distribution. Thailand, Japan, Taiwan, China, India, Java and New Guinea.

Remarks. Specimens were collected during the summer season at 255-1,020 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Phaecasiophora Grote, 1873

Phaecasiophora Grote, 1873, Bull. Buffalo Soc. Nat. Sci. 1: 90. Type species: *Sciaphila confixana* Walker, 1963

Megasyca Diakonoff, 1959, Ark. Zool. (2) 12: 171. Type species: *Sericoris mutabilana* Clemens, 1865. [subgenus of *Phaecasiophora*].

Phaecasiophora has been defined by the following characters; forewing oblong, apex gently rounded, termen convex, often with small raised tuft of scales. Labial palpus rather long, ascending and appressed to face, reaching to its middle, with more or less appressed scales, usually roughish, terminal segment very short. Hindtibia in male strongly tufted with dense scales and with yellow hair-pencil from base. Hindwing with a sclerotized ridge on dorsum. The male genitalia with uncus absent, socii large and pending, diversely shaped and densely haired, valva long, curved, without a primary incision or with a small one, sacculus gently dilated, along costa with a slight hairy prominence, sacculus bristles poorly developed, cucullus gradually narrowed. Aedeagus thick and short with a sheaf of long cornuti. The female genitalia with a well-developed lamella postvaginalis and diversely shaped lamella antevaginalis. Colliculum sclerotized and tubular, of diverse length. Signa absent or a pair, very small, scobinate. The genus includes 30 species worldwide. *Phaecasiophora* includes 10 species have been described from Southeast Asia (Brown, 2005). *Sassafras* (Lauraceae) and *Hamamelis* (Hamamelidaceae) are host plants of *P. niveiguttana* (Diakonoff, 1973)

Phaecasiophora walsinghami Diakonoff, 1959

Figs. 12.6, 42.3, 83.5

Phaecasiophora walsinghami Diakonoff, 1959, Ark. Zool. (2) 12: 179. Type locality: Indonesia (West Java, Mt. Gede-Panggrango, Tijbodas). Holotype (♂): RMNH.

Description. *Head*: Upper frons brownish red scales, lower frons white to yellowish white scales; labial palpus with first segment brownish red mixed with dark brown, orange white dorsally, second segment brownish orange mixed with brown ventrobasally, orange white dorsally, apical segment dark brown; vertex pale orange mixed with brownish orange scales.

Thorax: pronotal collar brownish red mixed with pale orange; tegulae pale orange mixed with orange red to brownish red; mesonotum pale orange to light orange mixed with brownish red; posterior scales tuft with pale orange mixed with brownish red. Forewing (Fig. 12.6): Length 9.88 mm in male (n=7), 11.68 mm in female (n=1); ground color and costal strigulae orange white to pale orange; strigulae 1-9 paired, and separated by dark brown spots, basal patch indistinct, extending from costa between strigulae 2 and 3 to inner margin, brownish red mixed with brownish orange and dark brown; median fascia irregular extending from costa between strigulae 4 and 5 to inner margin brownish orange mixed with brownish red and dark brown; postmedian fascia irregularly, extending from costa between strigulae 6 and 7 to tornus, brownish orange mixed with dark brown, interfascial area with distinct, brownish orange striae, strigulae 5-8 with diagonal striae, brownish grey, outer margin with indistinct dark brown striae. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, anal margin modified by yellow thickening of membrane to form scales groove. Hindfemur with white scales tuft extending from base of apex, enclosing hair pencil arising from femur base and extending to midlength, orange white.

Male genitalia (Fig. 42.3): Tegumen wide and rounded densely setose basoanteriorly with sclerotized lobe; uncus reduced; socii arising from dorsolaterally of tegumen, large and triangle with pointed apices, densely setose; gnathos arising from tegumen half, sclerotized basally, anellus not closely surrounding of aedeagus; cub-like at basal 2/3; aedeagus large and wide, with dense connuti; juxta triangular, ventrally rounded; saccullus with moderately long setae basally and medially, apically with very long setae mixed with long setae; neck with ventral moderately excavation,

with densely short and long setae; cucullus long, densely setose, basal angle enlarged, elevated beyond neck, very densely setose.

Female genitalia (Fig. 83.5): Sternum VII moderately large, sclerotized plate, posterior margin concaved medially, densely scaled; tergum VIII moderately dense scaled posteriorly, triangular lateral extensions densely scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with sternum VII, forming subrectangular, sclerotized plate, posterior margin slightly concave medially, scaleless, separated anteromedially, with lower inner edges rounded, thickened, lamella postvaginalis separated with lamella antevaginalis, subrectangular, sclerotized, anteromedial margin slightly concaved medially, with oblique ridge laterally; ostium bursae small, colliculum sclerotized, long, anterior 1/3 of ductus bursae length; ductus bursae with posterior 2/3 widened; ductus seminalis arising from midlength of ductus bursae; corpus bursae large, with two small, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'31"N 98°24'27"E, 13 May 2002 (3♂, genitalia slide NP435, NP477), 14°39'02"N 98°31'40"E, 25 Oct 2003 (1♂, 1♀, genitalia slide NP673), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂), 21 Nov 2003 (2♂).

Distribution. Thailand and West Java.

Remarks. Specimens were collected during the summer season to the early of winter season at 180-945 m in mixed deciduous forest and hill evergreen forest.

Unplaced *Phaecasiophora*

Phaecasiophora sp. A

Fig. 43.1

Description. Wing pattern poorly defined.

Male genitalia (Fig. 43.1): Tegumen with arms moderately broad, rounded dorsally, with dense setae posteriorly; uncus reduced present as round lobe; socii arising from tegumen dorsolaterally pendant ventrally to near tegumen half, pointed at apex, densely setose; gnathos arising from midlength of tegumen, completed band-like, sclerotized medially, with two sclerotized arms projecting ventrally to anellus; anellus cup-like not surrounding basal of aedeagus; aedeagus wide, moderately long, cornuti dense; juxta triangualar, acute ventrally; valva long, moderately curved; sacculus with sparsely setae basally, median with short setae along inner margin, dorsal with group of dense setae; neck reduced or absent; cucullus long and curved with dense setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♂, genitalia slide NP122).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Phaulacantha Diakonoff, 1973

Phaulacantha Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 185. Type species: *Argyroploce catharostoma* Meyrick, 1921.

Phaulacantha has been defined by the following characters; wing oblong, suboval-truncate, costa rather curved throughout. Labial palpus rather long, curved and ascending, not appressed to face, thickened with short roughish scales. Thorax with a strong posterior tufts. Hindtibia normally scaled, without pencil, scales rather long and roughish. The male genitalia with tegumen rather broad, high, uncus broad, rounded ,bilobed, apex notch, bristly on each side of notch. Socii rather large, a pending, oval lobe, gnathos indefinite. Valva moderate along basal half, cucullus moderate, clavate, top rounded, round patch of slender spine on sacculus, cucullus bristles, large spines of diverse sizes. In female genitalia, segment 9 moderately elongate, sclerotized. Sterigma densely aciculate, a moderate ring-like cup, lamella

antevaginalis notch in front, lamella postvaginalis extended above into a slender funnel open in front, colliculum short. Signa with two large pectination (Diakonoff, 1973). The genus includes 3 species worldwide and all have been described from Southeast Asia (Brown, 2005).

Phaulacantha metamelas Diakonoff, 1973

Figs. 12.7, 43.2, 83.6

Phaulacantha metamelas Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 188.

Type locality: East Borneo (Tabang, Kalimantan, Bengen River). Holotype (♂): RMNH.

Description. *Head*: Upper frons with dark brown scales, lower frons with white scales medially and dark brown scales laterally, labial palpus with first segment dark brown, second segment dark brown extending from ventrobasally to dorsoapical area, other area white scales, apical segment with white basally and dark brown apically, vertex dark brown mixed with brownish orange, brownish red and pale orange.

Thorax: Pronotal collar brown to dark brown; tegulae dark brown, with white scales at the middle; mesonotum dark brown mixed with white scales, posterior scales tuft brownish red mixed with dark brown. Forewing (Fig. 12.7): Length 7.58 mm in male (n=2), 9.13 mm in female (n=2); male costal fold absent, ground color and costal strigulae white; strigulae 1 and 2 presented by three spots at base; strigulae 3-4 and 7-8 paired and separated by dark brown, strigulae 5-6 present as three spots and strigulae 9 singled; subbasal fascia almost distinct on costa, extending from costa between strigulae 2 and 3 to inner margin, dark brown mixed with brownish orange and brown; postmedian fascia indistinct extending from costa between strigulae 4 and 5 to CuA_2, dark brown mixed with brown, dark brown spots on costa between strigulae 7 and 8 and between 8 and 9, white at apical area, ocellus region brown to dark brown with short longitudinal line between CuA_1 and CuA_2, dark brown; outer marginal scales dark brown , except marginal strigulae between M_1 and M_2 and

between CuA_1 and CuP. Underside light brown with pale yellow spots on costa and apex. Hindwing brown dorsally and margin modified by yellow thickening of membrane to form scales groove. Hindfemur with two types of hair pencil, one arising form femur base inside and extending to midlength, pale orange, other arising from femur base dorsally arising over midlength, medially dark brown and pale orange apically.

Male genitalia (Fig. 43.2): Tegumen moderately wide, dorsally rounded, densely setose; uncus large lobe, bifided, with densely setose apically, socii arising from dorsolateral area of tegumen, short and triangular with rounded apicies, moderated setose; gnathos arising from tegumen half, basally sclerotized, forming indistinct band; anellus closely surrounding at base of aedeagus; aedeagus short and wide; cornuti absent; juxta triangular, rounded ventrally; sacculus with moderately setose basally, sparsely short setose medially; neck slightly concave, setae absent, cucullus long with slightly concaved medially, basally with moderately large spine, and group of dense spines, elevated beyond neck, moderately setose medially and densely setose apically.

Female genitalia (Fig. 83.6): sternum VII lightly and even by sclerotized; tergum VIII scales absent; papillae anales width 0.34 of length, moderately setose, lateral setae arising from papillose bases; sterigma developed, sclerotized lamella postveginalis forming sclerotized plates, long, extending diverge to posteriorly, covered with microtrichia, setae absent; lamella antivaginalis forming broad rim covered with microtrichia, moderately sharp incised posterior margin, medially extending posteriorly to enclosed lamella postveginalis; ductus bursae with antrum forming sclerotized laterally, ductus seminalis arising from 1/4 of ductus burse length; signa with two group of small and large triangular teeth.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (2♀, genitalia slide NP107), 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP155), 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♂, genitalia slide NP222).

Distribution. Thailand and East Borneo.

Remarks. Specimens were collected during the winter season at 1,020 m in hill evergreen forest.

Rhodacra Diakonoff, 1973

Rhodacra Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 286. Type species: *Argyroploce pyrrhocrossa* Meyrick, 1912.

Corethrarcha Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 287. Type species: *Argyroploce rupifera* Meyrick, 1909.

Rhodacra has been defined by the following characters; moderately sized moth with subrectangular to subtriangular forewing, in male with anal margin of hindwing forming a spindle-shaped roll and hind tibia with a very long hair pencils. *Rhodacra. pyrrhocrossa*, the type species is brownish and finely dusted with whitish throughout, especially on dorsum, without any well-defined marking except white costal strigulae and a conspicuous reddish fringe. The male genitalia are diagnostic for the genus; the laterally expanded. T-shaped or trilobed uncus and a valva separated into a densely spined ventral lobe and a cresentic distal part by a deep semicircular ventral excision are both unique features. In the female is characterized by the two large signa formed by a large number of triangular, scale-like flat teeth (Diakonoff, 1973). The genus includes 3 species worldwide and all have been described from the Oriental region (Brown, 2005).

Rhodacra parvusa Kawabe, 1995

Figs. 12.8, 43.3

Rhodacra parvusa Kawabe, 1995, Microlepid. Thailand 3: 51. Type locality: Thailand (Loei, Phu Rua). Holotype (♂): ZMUC.

Description. *Head*: Lower frons white; upper frons greyish orange; labial palpus with first segment white to orange white, second segment greyish orange with small dark brown spot; apical segment greyish orange; vertex brownish orange.

Thorax: Pronotal collar brownish orange to light brown; tegulae light brown mixed with brown with white medially; mesonotum brownish orange intermixed with white; posterior scales tuft brownish orange. Forewing (Fig. 12.8): Length 5.64 mm in male (n=2); male costal fold absent; termen straight; ground color light brown to brown mixed with diffuse silvery scales, costal strigulae white, strigulae 1and 2 indistinct, strigulae 3-6 paired and separated by dark brown, strigulae 7-8 singled, fascia indistinct suffused with ground color present as darker spot on costa, strigulae 6-8 with confluent stripe extending irregulary from costa to inner margin near tornus, white; tornus with brown subtriangular spot between CuA_1 and tornus, outer margin with patch, brown mixed with diffuse silvery striae with dark brown spot between M_2 and M_3; outer margin with white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally. Hindtibia with hair pencils, light brown extending from base to mid tibia dorsally.

Male genitalia (Fig. 43.3): Tegumen moderately broad, with moderately dense scales along outer margin towards apicoanteriorly; uncus rather short, widened basally, densely setose, large bilobed at apex, with large spines on apical margin; socii small, densely setose, arising from base of uncus; gnathos arising from near midlength of uncus, widened band-like, slightly sclerotized; anellus surrounding basal of aedeagus, extending dorsally to half of length, basal opening; aedeagus moderately long, with sclerotized pointed lobe dorsoapically; cornuti absent; sacculus with sparse setae on median surface, outer margin with short, densely setose and group of very long, curved, spiniform setae, median with large trianguilar lobe, dense spines on dorsal edge, with dense, moderately long setae near basal opening, dorsal with long, sparse setae to cucullus; neck moderately long, with short, sparse setae ventral margin; cucullus long, clavate, dense spines apically towards along outer margin, inner margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 19 Jul 2003 (1♂), 24 Aug 2003 (1♂, genitalia slide NP586).

Distribution. Thailand.

Remarks. Specimens were collected during the rainy season at 180 m in mixed deciduous forest.

Rhodacra pyrrhocrossa (Meyrick), 1912

Figs. 44.1

Argyroploce pyrrhocrossa Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 874. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 44.1): Tegumen with arms moderately broad, basal half sparsely scaled, dorsal half densely scaled; uncus rather short, basal half subtriangular, widened, moderately dense scales, medially narrowed, apically dilated with apex truncated; socii rather small rounded lobe, arising from base of uncus, densely setose; gnathos arising from near midlength of tegumen, completed band, widened medially, weaklky sclerotized; anellus surrounding basal of aedeagus; aedeagus short, moderately wide; cornuti absent; valva long; sacculus with group of dense spiniform setae sockets basally, median with dense, short and moderately long spines between basal opening towards subtriangular lobe, large, at ventromedial area, ventral margin sparsely setose; neck deeply incised ventrally, sparsely setose; cucullus with dense spiniform setae, basal half widened, apical half slightly rotated and narrowed to rounded apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 23 Dec 2001 (1♂, genitalia slide NP38).

Distribution. Thailand, Japan, Taiwan and India.

Remarks. Specimen was collected during the winter season at 956 m in hill evergreen forest.

Semutophila Tuck, 1986

Semutophila Tuck, 1986, in Maschwitz, Dumpert & Tuck, J. Nat. Hist. 20: 1044.

Type species: *Semutophila saccaropa* Tuck, 1986.

The genus includes 2 species worldwide and all have been described from Southeast Asia (Brown, 2005).

Semutophila saccharopa Tuck, 1986

Figs. 44.2

Semutophila saccharopa Tuck, 1986, in Maschwitz, Dumpert & Tuck, J. Nat. Hist. 20: 1046. Type locality: Malaysia (Selangor, Ulu Gombak). Holotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 44.2): Tegumen high, narrowed, widened dorsally, subtriangular, with sparsely setose dorsolaterally, uncus and socii absent; gnathos arising from ventral 1/3 of tegumen length, slightly sclerotized narrowed line; anellus surrounding over basal 1/3 of aedeagus; aedeagus long as tegumen length, widened, tubular-like; cornuti absent; juxta small; valva long and slender, tubular-like, difficult to defined part of sacculus and cucullus, with basal opening long basal 2/3 of valva length, apical half sparsely setose, more dense to apex, apex rounded with single, short, curved spine.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'04"N 98°38'25"E, 22 Apr 2002 (1♂, genitalia slide NP350).

Distribution. Thailand (new record) and Malaysia.

Remarks. Specimen was collected during the summer season at 250 m in mixed deciduous forest.

Sisona Snellen, 1902

Sisona Snellen, 1902, Tijdschr. Ent. 44 (1901): 69. Type species: *Grapholitha albitibiana* Snellen, 1902. [described as subgenus of *Grapholitha*].

Sinona has been defined by the following characters; wing broad, suboval-truncate, apex rectangular, slightly rounded, termen vertical and gently sinuate above. Head with tufts on vertex raised. Labial palpus rather long, porrected, median segment gently curved and slightly dilated towards top. Terminal segment very short. Thorax with a long thick appressed scale-brush, originating from pleura just below base of forewing, directed caudad and reaching beyond middle of thorax. Hindtibia strongly thickened with dense white hair-scales, projecting above and beneath, outwardly scales normal, pale ochreous, inwardly extremely dense, forming thick appressed pencils above and beneath and a deep oblique concavity in middle of the length of tibia, in which fits a thin creamy pencil from base reaching middle of tibia. Hindwing with a rounded prominent lobe and a slightly marginal roll on dorsum. The male genitalia with tegumen rather short, uncus very short, acute point, with two pairs of moderate, bristly socii, upper slender, narrowed, subporrect and rigid, with a broad base, lower pair weak, rounded, pending. Gnathos indefinite, valva moderately slender, sinuate, little narrowed, cucullus not modified, 2/3 gradually and evenly spined throughout, basal bristles not modified, aedeagus short, cornuti, a comb of moderate spine (Diakonoff, 1973). The genus includes only one species worldwide and has been described from Southeast Asia (Brown, 2005).

Sisona albitibiana (Snellen), 1902

Figs. 13.1, 44.3

Grapholitha albitibiana Snellen, 1902, Tijdschr. Entomol. 44 (1901): 69. Type locality: Indonesia (West Java, Depok). Lectotype (♂): RMNH (lost).

Argyroploce inodes Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 269. Type locality: New Guinea (Woodlark Island). Holotype (♀): BMNH.

Argyroploce conchifera Meyrick, 1931, Exotic Microlepid. 4: 130. Type locality: Bismark Is. (New Britain, Talesea). Holotype (♂): BMNH.

Sycacantha inodes perspicua Diakonoff, 1968, Bull. U.S. Nat. Mus. 257(1967): 61. Type locality: Philippine Is. (Luzon, Mt. Makiling). Holotype (♂): USNM.

Sycacantha rubida Diakonoff, 1971, Veröff. Zool. Staatsamml. München 15: 195. Type locality: East Borneo (Tabang, Bengen River). Holotype (♂): RMNH.

Sycacantha inodes celebensis Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 149. Type locality: Indonesia (West Celebes, Palu District, Loda). Holotype (♂): BMNH.

Description. *Head*: Upper frons with long, pale orange intermixed with light brown and dark brown scales, extending over short, brownish red scales, lower frons with short, white to yellowish white scales; labial palpus with first segment orange white dorsally and ventrally, dark brown medially, second segment orange white medially and apically, mixed with brownish orange and pale red ventrally, dorsoapically with dark brown scales, apical segment yellowish white basally and dark brown dorsally; vertex dark brown intermixed with pale orange and brownish red scales, orange white scales posterior to chaetosemata, row of orange white mixed with brownish red scales posterior to eye.

Thorax: Pronotal collar light brown to dark brown mixed with pale orange to light brown scales; tegulae orange white mixed with greyish orange to light brown scales; mesonotum orange grey to greyish orange, posterior scales tuft orange white. Forewing (Fig. 13.1): Length 7.17 mm in male (n=1); male costal fold absent; termen straight, rounded at tornus; groung color and costal strigulae orange white, strigulae 1 singled, strigulae 2-9 paired and separated by dark brown spots, basal patch present as diffuse; subbasal fascia most distinct on costa between strigulae 2 and 3, extending to Sc, dark brown; median fascia distinct on costa extending from costa between strigulae 4 and 5 to R_1, dark brown and present as diffuse to tornus; postmedian fascia distinct extending from costa between strigulae 6 and 7 to outer margin at M_3, dark brown, dark brown line extending from costa between strigulae 7 and 8 and between strigulae 8 and 9 to outer margin between M_1 and M_2;ocellus region with irregular transverse line from R_2 to tornus; outer marginal scales dark brown except terminal strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with pale orange spots on costa. Hindwing light brown, anal margin modified by yellow thickening of membrane to form scaleless groove. Metafemur with white, ventral scales tuft extending from base to apex, enclosing hair pencil arising from tornal base and extending midlength, with black hair pencil basally, orange white apically, other half concolorous orange white throughout length.

Male genitalia (Fig. 44.3): Tegumen with arms, moderately broad, with anterior margin sclerotized, furcated dense setae basally, basoposteriorly with pointed sclerotized; uncus reduced as rounded lobe; moderately setose uncus; socii bilobed arising from base of uncus narrow and pointed with long setae apically, other broader, rounded lobe apically, with moderately setose; gnathos arising from 2/3 of tegumen length dorsally connected with gnathos, anellus not surrounding at base of aedeagus; aedeagus large and curved, dense long cornuti; juxta triangular, concave ventrally; saccalus with long setae basally, medially to neck basally with dense spiniform setae, apically with group of setae; neck concaved dorsally, cucullus ventromedially widened, rounded at apex, pointed mixed with bifided setae present diagonally on cucullus between dorsoapically to ventrobasally, dorsoventrally with bifided spines, ventrally sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°35'08"N 98°38'20"E, 18 Apr 2002 (1♂, genitalia slide NP323).

Distribution. Thailand, West Java and West Celebes.

Remarks. Specimen was collected during the summer season at 360 m in dry evergreen forest.

Sorolopha Lower, 1901

Sorolopha Lower, 1901, Trans. R. Soc. S. Austral. 25: 73. Type species: *Sorolopha cyclotoma* Lower, 1901.

Acanthothyspoda Lower, 1908, Trans. R. Soc. S. Austral. 32: 319. Type species: *Acanthothyspoda elaeodes* Lower, 1908.

Alypeta Turner, 1916, Trans. R. Soc. S. Austral. 40: 528. Type species: *Alypeta delochlora* Turner, 1916.

Alytopeta Fletcher, 1929, Mem. Dept. Agric. India (Ent.) 11: 10. [misspelling of *Alypeta*].

Choganhia Razowski, 1960, Polskie Pismo Ent. 30: 387. Type species: *Argyroploce sphaerocopa* Meyrick, 1930.

Sorolopha has been defined by the following characters; conspicuously color often in shades of green, or brownish grey with a pinkish triangle over apical area containing brown roundish subapical mark, with sinuate, porrect, stout and moderately long labial palpi. Male often with large scale-tufts of sex scales on hindlegs, laterally on abdomen and on apical area of hindwing. Abdomen often with scale brushes arising laterally from segments 2-7, variously developed in different species. The male genitalia, characterized by long and thin socii bristled mainly on apex, by lack of

an apically free gnathos are diagnostic for *Sorolopha*. The female genitalia with lightly sclerotized sterigma, short, spinulose funnel with variously developed lamella antevaginalis. The signum may be single or paired but it is either a scobinate depression or appointed thorn. The genus includes 62 species worldwide. *Sorolopha* includes 41 species have been decribed from Southeast Asia (Brown, 2005). *Sorolopha* are leaf rollers on a wide range of plants (Lauraceae, Myrtaceae, Magnoliaceae, Pandanaceae) (Diakonoff, 1973).

Sorolopha archimedias (Meyrick), 1912

Figs. 13.2, 44.4

Argyroploce archimedias Meyrick, 1912, Exotic Microlepid. 1: 63. Type locality: China (Hong Kong). Lectotype (♂): BMNH.

Eudemis oxygona Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 50. Type locality: Philippine Is. (Luzon, Los Baños). Holotype (♀): USNM.

Description. *Head*: Upper frons with brownish orange to brown, lower frons with orange white to pale orange; labial palpus with first segment pale orange mixed with brown scales, second segment greyish brown intermixed with brownish orange to brown, apical segment light brown mixed with dark brown dorsally; vertex brownish orange to light brown.

Thorax: Pronotal collar light brown; tegulae with individual scales light brown and pale orange apically; mesonotum brownish orange to light brown, posterior scales tuft reddish brown to dark brown. Forewing (Fig. 13.2): Length 5.73 mm in male (n=2); male costal fold absent, termen convex; ground color and costal strigulae pale orange to reddish white; costal strigulae 1 and 2 poorly defined at base, strigulae 3-7 paired and separated by dark brown, strigulae 8 and 9 singled; subbasal fascia expressed on inner margin to the middle of wing, reddish brown to dark brown, median fascia present distinct on costa between strigulae 4 and 5, extending diagonally to tornus, present diffuse near tornus, brown to dark brown, brownish

orange to brownish grey near tornus; postmedian fascia present distinct on costa between strigulae 6 and 7, dark brown, extending diagonal as diffuse to R_4, a dark brown line extending diagonally between strigulae 8 and 9 to outer margin at R_5, apex of wing dark brown between strigulae 9 and R_5; outer 1/4 of wing with large rounded patch, dark brown between R_4 and R_5 to between M_3 and CuA_1. Hindwing brown dorsally, light browm ventrally.

Male genitalia (Fig. 44.4): Tegumen wide and high, moderately scales and setae; uncus reduced as small lobe, rounded at apex; with moderately setose at base; socii long and curved pendent from base of uncus to half of tegument, apically 1/3 with moderated spiniform setae, socii length 0.42 of tegumen length, basally to 2/3 at apical with sparsely setae; gnathos arising from near half of tegumen, sclerotized basally; anellus closely surrounding at base of aedeagus, aedeagus rather long and curved; cornuti absent; valva with moderately setae at base of sacculus, small lobe at middle of sacculus with short spines and spiniform setae; valva slightly incised ventrally with group of moderately short spines and spinifrom setae near ventral margin of neck, dorsally with row of setae; cucullus moderately long with slightly concave medially, rounded at apex and broadly rounded at base, base of cucullus with densely short and long spines mixed with densely setose; medially to apex with densely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'11"E, 20 Aug 2002 (1♂, genitalia slide NP440), 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂, genitalia slide NP556).

Distribution. Thailand (new record), China, Hong Kong, Ceylon, India and Java.

Remarks. Specimens were collected during the rainy season at 180-1,000 m in mixed deciduous forest and hill evergreen forest.

Sorolopha herbifera (Meyrick), 1909

Figs. 13.3, 45.1

Argyroploce herbifera Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 603. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH

Description. *Head*: Upper frons with brownish orange and dark brown scales intermixed, lower frons with orange white scales; labial palpus with first segment orange white to pale orange, second segment with pale orange mixed with orange grey to brownish grey, apical segment brownish orange; vertex greyish orange to brownish grey with small patch of short, orange white scales posterior to chaetosemata and row of pale orange mixed with greyish brown scales posterior to eye.

Thorax: Pronotal collar greyish green, tegulae brownish orange mixed with brown to dark brown and pale orange posteriorly; mesonotum brownish orange mixed with brown and dark brown, posterior scales tuft with greyish green. Forewing (Fig. 13.3): Length 8.31 mm in male (n=3), male costal fold absent; termen convex, ground color and costal strigulae yellowish white, costal strigulae 1-8 paired and separated by dark brown, strigulae 9 singled; a diffuse basal patch present most distinct on costa basally to strigulae 3 and on inner margin, brown and dark brown mixed with greyish green on inner margin; median fascia and postmedian fascia forming irregular patch, greyish green mixed with brown and dark brown extending from costa to between Cu and 1A+2A and extending enlarge to tornus, brown spots present on costa between strigulae 7 and 8, 8 and 9 and at apex, outer margin 1/4 with large patch, greyish green mixed with dark brown except yellowish white terminal strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 45.1): Tegumen wide and height with diagonal sclerotized line on ventral 1/4, dorsoanterior margin 1/5 joined together, uncus reduced as rounded lobe with small projection densely setose at base; socii long and curved, socii length 0.57 of termen length pendant from base of uncus to tegumen half, apically

with moderately spiniform setae, basally 4/5 with densely setose; gnathos arising from half to tegument, band-like, sclerotized basally; anellus most closely surrounding base of aedeagus; aedeagus long and curved, enlarged basally and tapered apically, outer margin 2/3 basally with sparse micro-spines; juxta triangular, ventrally rounded; valva with group of setae at sacculus base, cluster of spines at middle of sacculus; neck deeply incised ventrally with rows of long setae ventrally direction near cucullus, costal margin with moderately setose; cucullus with slightly notched medially with dorsal portion forming long projection, rounded at apex with densely setose, ventral portion forming digitate, pointed spine at apex, outer margin of cucullus with row of spines from dorsal portion to ventral portion.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP108), 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♂, genitalia slide NP211), 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂, genitalia slide NP595).

Distribution. Thailand, India, Sumatra and West Java.

Remarks. Specimens were collected during the winter season at 180-1,020 m in mixed deciduous forest and hill evergreen forest.

Sorolopha nagaii Kawabe, 1989

Figs. 13.4, 84.1

Sorolopha nagaii Kawabe, 1989, Microlepid. Thailand 2: 26. Type locality; Thailand (Chiang Mai, Doi Pui). Holotype (♂): OPU.

Description. *Head*: Lower frons yellowish white, upper frons brownish orange to light brown; labial palpus with first segment orange white, second segment orange white mixed with greyish orange, apical segment greyish orange; vertex brownish orange.

Thorax: Pronotal collar greyish orange; tegulae olive brown, with light yellow apically; mesonotum difficult to defined, posterior scales tuft greyish yellow. Forewing (Fig. 13.4): Length 8.68 mm in female (n=1); termen rather straight; ground color light brown; costal strigulae yellowish white, strigulae 1-8 paired and separated by dark brown, strigulae 9 singled; basal patch extending irregularly from wing base to strigulae 3 and from costa to inner margin, brown to dark brown; median fascia distinct extending from costa to inner margin, enlarged medially and pointed to inner margin, brown with dark brown on margins, proximal margin strongly concaved at discal cell, present as large white spot with short, longitudinal olive brown strip medially, distal margin extending oblique to R_5, angled and extending to inner margin, inner margin between basal path and median fascia with subtriangular patch from inner margin to midwing, brown; postmedian fascia present as dark brown spot on costa, pretornal patch distinct extending from inner margin curve to M_1, brownish orange; ocellus region with white spots between R_4 and M_1, containing olive brown short strip medially, with olive brown patch between R_4 and M_2 and greyish yellow patch from R_4 to between M_1 and M_2, tornus with indistinct patch extending irregularly from inner margin to M_2; outer margin with distinct brown line broken by yellowish white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 84.1): Sternum VII with large sclerotized plate, posterior margin concaved medially, densely scaled and microtrichiate, sparsely setose; tergum VIII sparsely setose, triangular lateral extensions densely scaled, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis laterally forming sclerotized ring, raised up, widened, lamella postvaginalis more narrowed, surrounding ostium bursae at top, dense microtrichia; ductus bursae with antrum sclerotized, funnel-shaped, long near anterior half; ductus seminalis arising from posterior end of ductus bursae; corpus bursae with two unequal signa, small, scobinated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP429).

Distribution. Thailand.

Remarks. Specimen was collected during the summer season at 745 m in hill evergreen forest.

Sorolopha plinthograpta (Meyrick), 1931
Fig. 45.2

Argyroploce plinthograpta Meyrick, 1931, Exotic Microlepid. 4: 135. Type locality: Formosa [Taiwan] (Taihoku). Holotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 45.2): Tegumen with arms moderately broad, high, with obliquely sclerotized process ventral half, moderately scales; uncus reduced to round lobe, moderately dense setae; socii pendant from base of uncus, moderately dense setae mixed with sparse spiniform setae; gnathos arising from midlength of tegumen, strongly sclerotized basally; anellus closely surrounding basal 1/3 of aedeagus; aedeagus long and curved, basally enlarged; vesica open at apical 1/3 of aedeagus; cornuti absent; juxta triangular; valva with moderately dense setae and cluster of stout spiniform setae medially, deeply incised ventrally, with group of long setae on ventral margin, mixed with short spiniform setae ventromedially; cucullus deeply incised medially with dorsal portion forming rounded lobe projection, densely setose, ventral portion forming digitate with short, one spine at apex, densely setose basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 4 Feb 2002 (2♂, genitalia slide NP385, NP412).

Distribution. Thailand, Japan, Taiwan and East Java.

Remarks. Specimens were collected during the winter season at 990 m in hill evergreen forest.

Sorolopha semiculta (Meyrick), 1909

Figs. 13.5, 45.3, 84.2

Argyroploce semiculta Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 604. Type locality: Ceylon [Sri Lanka] (Hakgala). Lectotype (♂): BMNH.

Argyroploce heteraspis Meyrick, 1936, Exotic Microlepid. 4: 614. Type locality: Formosa [Taiwan] (Kagi). Holotype (♀): BMNH.

Description. *Head*: Upper frons greyish green to greenish grey; lower frons orange white short scales; labial palpus with first segment pale orange, second segment pale orange to greyish orange mixed with greyish green ventrally and dorsoapically, apical segment light brown with dark green spot dorsoapically to apex, vertex greyish brown to greyish grey.

Thorax: Pronotal collar greyish green to deep green; tegulae greyish green to dullgreen; mesonotum greyish green with two slightly darker transverse lines, with greyish green posterior scales tuft. Forewing (Fig. 13.5): Length 7.25 mm in male (n=1), 7.36 mm in female (n=1); male cosal fold absent, termen slightly concave between R_5 and M_2; ground color greenish white, costal strigulae pale orange; strigulae 1 and 2 singled, broad, strigulae3, 5-8 paired and separated by dark brown spots, strigulae 4 two paired, strigulae 9 singled; basal area greyish green extending from base to basal 1/4 of wing except inner margin, extending along margin to median fascia, basal 2/3 of wing crossed indistinct, dark brown striae; median fascia distinct extending diagonally form costa between strigulae 4 and 5 to tornus, enlarged at middle of wing, dark brown mixed with greyish green near tornus; postmedian fascia distinct on costa between strigulae 6 and 7, extending as narrow line to CuA_1, dark brown; dark brown spots on costa between strigulae 7 and 8, 8 and 9 extending diagonally to outer margin between R_5 and M_1; wing apex dark brown; outer 1/4 of

wing with large oval-shaped patch, dark brown between R_3 to between CuA_1 and CuA_2 at outer margin; outer margin with distinct dark brown striae broken by strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside brown with greyish orange spots on costa and outer margin. Hindwing dark brown at outer margin dorsally, ventrally light brown with pale orange mixed with greyish orange on costa and outer margin. Metafemur with white ventral tufts extending from base to apex, enclosing hair pencils arising from femur base and extending midlength, basal half of hair pencil, black, orange white apical half, concolorous orange white thoughtout length. Ventral surface of metafemur with white hair tufts extending from base to apex, enclosing short black hair pencils at base on white pencils extending from base to mid length.

Male genitalia (Fig. 45.3): Tegumen with arms broad, moderately dense scales laterally; uncus reduced forming small round lobe; socii moderately long, densely setose, pendant from base of uncus to dorsal 1/3 of tegumen length; gnathos arising from midlength of tegumen, widened band; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long and slender, curved medially; sacculus with moderately dense, long setae ventromedially, median with group of dense, long setae, dorsal sparsely setose reaching to neck; neck rather wide, concaved; cucullus deeply incised apicomedially forming two portions, dorsal portion long, slightly widened to apex, rounded at apex, densely setose except outer marginal area, ventral portion forming large subtriangular lobe with short, single apine at apex, densely setose, outer margin sparsely setose.

Female genitalia (Fig. 84.2): Stermen VII lightly and evenly sclerotized deeply concaved posteriorly, tergum VIII sparsely setose; papillae anales width 0.37 of length, relatively wide posteriorly, moderately setose, lateral setae arising from papillose bases, sterigma tougue-shaped with lamella antevaginalis well developed with lateral ridges extending anteriorly form posterolateral corners to ostium bursae, lamella postvaginalis reduced to narrow ring posterior to ostium; antrum fennel-shaped, long, heavily sclerotized; ductus seminalis arising posteriorly near corpus bursa; signa small, rounded slightly scobinated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♀, genitalia slide NP140), 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂, genialia slide NP756).

Distribution. Thailand, Taiwan, India, Sri Lanka and Solomon Is.

Remarks. Specimens were collected during the rainy season and winter season at 180-1,019 m in mixed deciduous forest and hill evergreen forest.

Sorolopha sphaerocopa (Meyrick), 1930

Figs. 13.6, 45.4

Argyroploce sphaerocopa Meyrick, 1931, in Joannis, Annls. Soc. Ent. Fr. 98 (Suppl.): 719. Type locality: Vietnam (Tonkin, Cho ganh). Holotype (♂): MNHN

Description. *Head*: Upper frons yellowish grey, lower frons yellowish white, labial palpus with first segment yellowish white mixed with yellowish grey to brownish grey, second segment yellowish white to brownish grey mixed with olive brown, apical segment brown; vertex yellowish grey.

Thorax: Pronotal collar brownish orange; tegulae brownish grey to yellowish grey mixed with dark brown and large orange white scales apically, mesonotum yellowish grey to brownish orange mixed with light brown. Forewing (Fig. 13.6): Length 6.15 mm in male (n=2); male costal fold absent, termen rounded, ground color and costal strigulae yellowish white intermixed with yellowish grey and orange grey; costal strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal fascia present on costa between wing base and strigulae 1 extending to humeral angle by diffuse; subbasal fascia present on costal margin between strigulae 2 and 3 extending to inner margin by dark brown umbrae; wide median fascia present on costal margin between strigulae 4 and 5, extending obliquely to inner margin near tornus by olive brown mixed with light brown to brown orange and dark brown; postmedian fascia present as distinct dark brown and separated by brown at costal

margin between strigulae 6 and 7, diffuse as dark brown short line, present diagonally under postmedian fascia and one close to the outer margin of median fascia, a dark brown line extending as diffuse from between strigulae 7 and 8 to outer margin a small spot adjacent between strigulae 8 and 9, outer margin 1/4 of wing dark brown mixed with brown as large oval spot close to outer margin, outer marginal scales dark brown mixed with reddish brown, outer margin of wing dark brown except for yellowish white terminal strigulae between R_3 and M_1, M_1 and M_2, M_2 and M_3, $CuA_1$and CuA_2. Hindwing brown with hair pencils on Cu basally in male and anal lobe.

Male genitalia (Fig. 45.4): Tegumen long, scales present moderately by uncus apically round projection moderately scales dorsobasally; socii long pendant from base of uncus to near tegumen half length, basal 1/3 with long sparse setae, apical 1/4 with dense stout setae; gnathos arising from apical 1/3 of tegumen, sclerotized basally; anellus closely surrounding basal 1/6 of aedeagus; aedeagus moderately curved, basal widened and slightly tapered apically; cornuti absent; juxta triangular, ventrally rounded, caulis long; valva with small group of short slender setae at base of sacculus; neck deeply incised ventrally, dorsally with sparse setae; cucullus deeply notched medially with dorsal portion forming digitate setae projection and ventral portion with enlarge sprines along margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP109), 14°41'32"N 98°24'17"E, 13 Jun 2002 (1♂, genitalia slide NP.373).

Distribution. Thailand, Japan, China, Sumatra, West Java and Moluccan Is.

Remarks. Specimens were collected during the winter season and the summer season at 960-1,020 m in hill evergreen forest.

dorsally of tegumen to 2/3 ventrally, apically 1/5 with moderately long spiniform setae, basal 4/5 with sparse setae; gnathos arising from half of tegument length, curved and strongly sclerotized; anellus not closely surrounding at base of aedeagus, cub like, caulis enlarge apically; aedeagus long, slightly long and curved basally, tapered apically, cornuti absent; juxta ventrally rounded; valva with moderately setose basally, cluster of long setae and group of stout spines at middle of sacculus, sacculus with lobe projection at middle, dense setae ventrally directed under lobe, two long spiniform setae on costa of right valva but only one on left costal valva; neck with moderately setose, one spine on ventral margin; cucullus slightly notched medially with dorsal portion forming digitate, prolong rounded lobe with densely setose, ventral portion projection narrow with one spine at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 10 May 2002 (1♂, genitalia slide NP369).

Distribution. Thailand (new record) and Java.

Remarks. Specimen was collected during the summer season at 195 m in mixed deciduous forest.

Unplaced *Sorolopha*

Sorolopha sp. A
Figs. 13.8, 46.2, 46.3

Description. *Head*: Upper frons greyish green apical half and orange white basal half, lower frons orange white, labial palpus with first segment pale orange, second segment greyish orange mixed with brown and dark brown, apical segment brown mixed with dark brown; vertex greyish green apical half and pale orange basal half.

Sorolopha stygiaula (Meyrick), 1933

Figs. 13.7, 46.1

Argyroploce stygiaula Meyrick, 1933. Exotic Microlepid. 4: 419. Type locality: Indonesia (Java, Seneng). Lectotype (♂): BMNH.

Decription. *Head*: Upper frons with brown to dark brown scales; lower frons with orange white scales; labial palpus with first segment white to yellowish white, second segment yellowish white to orange white basally, mixed with light brown to dark brown, apical segment brown; vertex brownish orange with brown to dark brown scales anteriorly, with small patch of short, dark brown scales posterior to chaetosemata and row of dark brown scales posterior to eye.

Thorax: Pronotal collar with brown scales; tegulae with brownish orange mixed with brown and dark brown scales, large light brown scales posteriorly; mesonotum greyish orange mixed with brownish orange to brown, posterior tuft with dark brown apically. Forewing (Fig. 13.7): Length 7.92 mm in male (n=1); male costal fold absent; termen rounded, ground color and costal strigulae orange white to pale orange; costal strigulae 1-3 and 5-8 paired and separated by dark brown, strigulae 4 two pairs, and strigulae 9 singled; a diffuse basal patch present by dark brown, most distinct on Sc to R and on inner margin; median fascia presented by band divergent, extending diagonally to humeral angle, dark brown, and extending diagonally to tornus by diffuse dark brown half; postmedian fascia present as diffuse dark brown between strigulae 6 and 7 to R_3, a line between R_4 and R_5 close to postmedian fascia extending diagonal to tornus, dark brown to light brown, a dark brown line extending from strigulae 7 and 8 to outer margin between R_5 and M_1, outer 1/4 of wing with brown oval-shaped between R_4 to Cu; terminal strigulae present between R_5 and M_1, M_1 and M_2. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 46.1): Tegumen wide and long with sclerotized near ventrally and sclerotized joint between left and right anterior margin of tegumen near 1/4 dorsally, uncus reduced to rounded lobe, moderately setose; socii pendant from

Thorax: Pronotal collar with individual scale dark green apical half and pale orange basal half; tegulae greyish green mixed with brown and brownish orange; mesonotum pale orange intermixed with greyish green, transverse dark brown strip on mesonotum, posterior tufts dark brown apically and pale orange basal 2/3. Forewing (Fig. 13.8): Length 6.59 mm in male (n=4); male costal fold absent, termen convex, ground color and costal strigulae light green; costal strigulae 1-9 paired and separated by brown; subbasal fascia present as diffuse, most distinct on costa between strigulae 2 and 3, median fascia present between strigulae 4 and 5, extending enlarged to inner margin, greyish green mixed with brown and dark brown; postmedian fascia present between strigulae 6 and 7 extending enlarged diagonally to outer margin, brown mixed dark brown, narrow brown line present between strigulae 7 and 8 extending to outer margin between R_5 and M_1, dark brown spot between strigulae 8 and 9, and apex; outer marginal scales brown mixed with greyish green except terminal strigulae between R_5 and M_1, M_1 and M_2 and CuA_1 and CuA_2. Hindwing with CuA_2 vein near margin bearing dense orange grey scales. Hindtibia greyish orange with dark brown mixed with orange white hair pencils arising from inner tibia medially extending to the end of tibia.

Abdomen (Fig. 46.3): Sternum III-VII bearing dense long hair pencils, paired on each sternum, between sternum 3 and 4 with a pair of group, short scales.

Male genitalia (Fig. 46.2): Tegumen wide and flat with diagonal sclerotized line at 2/3 basally, scales present sparsely; uncus reduced as rounded lobe, moderately setose; socii pendant from base of uncus, curved and long 1/3 of tegumen length, socii length 0.34 of tegumen length, basal half with moderately setose, moderately long spiniform setae apically; gnathos arising from apical 1/3 of tegumen; anellus closely surrounding at base of aedeagus; aedeagus curved, enlarged basally, taper to apically, cornuti absent; valva with group of moderately setose basally of sacculus, sacculus with short spines mixed with long setae medially; neck deeply incised ventrally, dorsal with one row of setae; cucullus deeply notched medially with dorsal portion projection as rounded lobe, dense setae, ventral portion projection as rounded lobe wider than dorsal portion, bearing dense spines and spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (2♂, genitalia slide NP514, NP415), 11 Jun 2002 (1♂), 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP170).

Remarks. Specimens were collected during the winter season and the summer season at 740-1,020 m in montane evergreen forest.

Sorolopha sp. B

Figs. 14.1, 84.3

Description. *Head*: Upper frons greyish green with each scale orange white basally, lower frons orange white; labial palpus with first segment greenish grey, second segment greyish green to pale green mixed with greyish green to dark green, apical segment greyish green to dark green; vertex greyish green to greyish grey.

Thorax: Pronotal collar greyish green to dark green; tegulae greyish green to green mixed with greyish green to greyish grey and dark brown; mesonotum greyish green to deep green and two dark brown spots, posterior scales tuft greyish green to deep green. Forewing (Fig. 14.1): Length 7.25 mm in female (n=1); termen convex; ground color and costal strigulae orange white to pale orange, strigulae 1-2 and 5-9 paired and separated by dark brown, strigulae 3-4 with two paired and separated by dark brown; fasciae confluenced forming large patch, greyish green to deep green extending obliquely from costa to inner margin near tornus, except postmedian fascia extending from costa to outer margin at R_4 base, cresent-shaped, brown between R_5 and M_2, a dark brown line extending diagonally between strigulae 7 and 8 to outer margin between R_5 and M_1; wing apex dark brown; outer 1/4 of wing with rounded patch, brown mixed with dark brown; outer margin with dark brown line, broken by pale orange strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown to dark brown near outer margin dorsally, light brown ventrally.

Female genitalia (Fig. 84.3): Sternum VII with moderately sclerotized plate, moderately dense scales and setae; papillae anales relatively wide, densely setose, lateral setae with papillose bases; sterigma developed forming large lobe, sclerotized; lamella postvaginalis reduced, slightly sclerotized with dense microtrichia, lamella antevaginalis forming large swollen lobe, deeply incised medially, antrum sclerotized forming cone-shaped; ductus seminalis arising from anterior 2/3 of ductus bursae; ductus bursae sclerotized posterior 2/3; corpus busae with two unequal signa, one sigum short and stout with small base, the other forming small sclerotized patch.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♀, genitalia slide NP439).

Remarks. Specimen was collected during the late of summer season at 745 m in hill evergreen forest.

Statherotis Meyrick, 1909

Statherotis Meyrick, 1909, J. Bombay Nat. Hist. Soc. 19: 591. Type species: *Statherotis decorata* Meyrick, 1909.

Statherotis has been defined by the following characters; small to large moth, with the typical pattern of usually darkish greyish ground color with a paler and often pinkish tinged triangle or semicircle over middle of costa. Males often have patches of black androconial scales on center of hindwing and underside of forewing. The male hind tibia is often enlarged by scale fringes. The male genitalia with their slender valva with a ventral triangular process in the distal portion of cucullus, are diagnostic for the genus. The female genitalia with paired, bristled triangular to rod-shaped process above or lateral to ostium, together with a smooth-walled ductus bursae and pectinate signa. The genus includes 29 species worldwide. *Statherotis* includes17 species have been described from Southeast Asia. *Nephelium lappaceum* L. and *N. litchi* Chambess (Sapindaceae) in Southeast Asia, and there is one rearing

record from *Eugenia polyantha* Barb. Rodr. (Myrtaceae) are reported as host plants (Diakonoff, 1973). *Statherotis discana* is a pest on litchi in Japan (Nasu *et al.* 1993).

Statherotis discana (Felder & Rogenhofer), 1875
Figs. 14.2, 46.4

Tortrix discana Felder & Rogenhofer, 1875 (*Tortrix*?), Reise öst Fregatte. Novara (Zool.) (2)5: pl. 137, fig. 41. Type locality: Molucca Is. (Amboina). Holotype (♂): BMNH.

Statherotis discana saturata Diakonoff, 1973, (*Statherotis discana* form), Zool. Monogr. Rijksmus. Nat. Hist. 1: 246. Type locality: Indonesia (West Java, Gede-Panggarango Mt., Tijbodas). Holotype (♂): RMNH.

Statherotis discana cuneata Diakonoff, 1973), Zool. Monogr. Rijksmus. Nat. Hist. 1: 247. Type locality: Indonesia (East Java, Tengger Mountains, Tretes). Holotype (♂): RMNH. [subspecies of *discana*].

Description. *Head*: Upper frons light brown to brown, lower frons light brown with white scales; labial palpus with first segment light brown with white dorsally, second segment white to orange white with dark brown spot dorsobasal 1/4, with transverse dark brown strip near apically, apical segment light brown to brown; vertex brown mixed with pale red.

Thorax: Pronotal collar dark brown; tegulae brown mixed with greyish orange medially. Forewing (Fig. 57): Length 6.36 mm in male (n=2); male costal fold absent, termen straight, ground color light brown with diffuse transverse brown striae near inner margin, with pale orange spots; costal strigulae white, strigulae 1-8 paired and separated by dark brown, strigulae 9 singled; wing suffused with brown from base to apex, with large patch trapezoidal-shaped, reddish white to pale red mixed with orange white at ventral margin of patch extending from strigulae 3 to strigulae 7, and

from costa to M_1 at middle, with patch bordered by sinuate band, dark brown extending from costa to apex at M_3: ocellus region with irregular dark brown strip between M_2 to tornus and mottled silvery scales between M_2 and CuP, surrounding by pale orange scales; outer margin with distinct dark brown striae broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellow grey spots on costa and outer margin between veins, with sex scales basomedially, dark brown extending from middle of discal cell to CuA_2. Hindwing brown dorsally with sex scales dark brown basomedially extending from $Sc+R_1$ to CuA_2, anal area sclerotized and curved with dense scales tuft along anal margin, white, ventral light brown, anal lobe with dense scales tuft, orange white.

Male genitalia (Fig. 246): Tegumen moderately wide, slightly narrow medially, with dense long scales along outer margin; uncus moderately long and broad, slightly rounded apex, with dense setae except dorsally; socii small, subovate with moderstely dense setae; gnathos arising from dosal 1/3 of tegumen, moderately sclerotized band, median concaved, sclerotized, with slightly sclerotized plate extending from gnathos to anellus; anellus surrounding at base of aedeagus; aedeagus rather short, without cornuti; juxta subquadrate; sacculus with group of moderately dense setae ventrobasally to ventromedially, basal opening medially with large lobe, moderately dense spiniform setae, ventroapically with group of short spiniform setae, dorsoapically with sclerotized oblique loop, with group of strong spines along margin; neck slightly excavation; cucullus with a triangular process, outer margin medially, with single, strong, short spine at apices, with moderately dense spines from neck to mid of cucullus, apically with dense setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP674), 14°41'43"N 98°27'34"E, 22 Aug 2003 (1♂).

Distribution. Thailand, Taiwan, Philippine Is., India, Java, Solomon Is. and Moluccan Is.

Remarks. Specimens were collected during the rainy season and the winter season at 255-745 m in dry evergreen forest and hill evergreen forest.

Statherotis leucaspis (Meyrick), 1902

Figs. 14.3, 84.4

Eucosma leucaspis Meyrick, 1902, in Gardiner, Fauna Geogr. Maldive Laccadive Arch. 1: 126. Type locality: Maldives (Minikoi Is.). Lectotype (♂): UMCE.

Description. *Head*: Upper frons brownish grey, lower frons orange white; labial palpus with first segment white, second segment white intermixed with grey ventroapically, with brownish grey dorsoapically, apical segment grey; vertex orange white mixed with reddish white.

Thorax: Pronotal collar light brown to brown; tegulae light brown to brown mixed with greyish red basally; mesonotum light brown to brown. Forewing (Fig. 14.3): Length 6.53 mm in male (n=2); male costal fold absent; termen slightly concaved between R_5 and M_2; ground color light brown; costal strigulae white, except strigulae 1 and 2, light brown, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; wing suffused with brown from base to apex, with large patch, trapezoidal-shaped, reddish white to pale red extending from strigulae 3 to strigulae 7, and from costa to M_1 medially, with patch bordered by sinuate band, dark brown extending from costa to apex at M_3; termen area between M_2 and CuP mottled with orange white and silvery scales, preterminal strigulae extending from costa to R_5, dark brown; outer margin with distinct dark brown striae, broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 84.4): Sternum VII slightly sclerotized plate, densely scaled; tergum VIII without scales and setae, with moderately dense scales on triangular lateral extension posteriorly; papillae anales densely setose, lateral setae

with papillose bases; sterigma sclerotized with dense microtrichia, with lateral forming porrect lobes, rather short, rigid and rounded apices; ostium busae margin with dense microtrichia; colliculum long and slender, nearly half of ductus bursae; ductus seminalis arising from middle of ductus bursae; corpus bursae with two unequal signa, pectination, teeth obtusely pointed, broad basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°31'52"N 98°37'58"E, 14 Mar 2002 (1♀, genitalia slide NP303), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia NP608).

Distribution. Thailand, Maldives Is, Java, Marshall Is. and Ellis Is.

Remarks. Specimens were collected during the winter season and the summer season at 270-745 m in hill evergreen forest.

Unplaced *Statherotis*

Statherotis sp. A

Figs. 14.4, 84.5

Description. *Head*: Lower frons white to orange white, mixed with dark brown dorsally, upper frons light brown to brown; labial palpus with first segment white mixed with dark brown, second segment dark brown with white scales ventrally, metallic green when viewed at angle to light, and orange white scales apically, apical segment white; vertex brown with each scales light brown apices.

Thorax: Pronotal collar brown with greyish orange apices; tegulae greyish brown with orange white apices, with strip basal 1/3, dark brown with greyish orange apices; mesonotum dark brown with greyish orange apices. Forewing (Fig. 14.4): Length 5.09 mm in female (n=1); termen rather straight; ground color and costal strigulae white, strigulae 1 and 3-4 paired and separated by dark brown, strigulae 2 and 5-9 singled; basal patch indistinct, extending from costa between wing base and

strigulae 3 to inner margin, brown to dark brown with some scales greyish orange apices; median fascia indistinct extending from costa between strigulae 4 and 5 to inner margin, brown mixed with dark brown with greyish orange apices, strigulae 5 with grey striae extending diagonally to outer margin, area between median fascia and ocellus region with large patch, grey with some scales greyish orange apices; ocellus region with irregularly striae, dark brown between R_5 and inner margin, tornus with brown spot surrounding with greyish orange and dark brown scales; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown to brown ventrally.

Female genitalia (Fig. 84.5): Sternum VII moderately sclerotized, posterior margin concave medially, dense scales, sparsely setose, with dense microtrichia posterolateral corners; tergum VIII densely microtrichiate, without scales, sparsely scaled on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; sterigma sclerotized, cup-like, with dense fine denticles on edge and inner margin, lower edge slightly incised medially; colliculum long and slender; ductus seminalis arising from 1/5 of tegumen; ductus bursae very long; corpus bursae with two unequal signa, forming several comb of flat teeth, broad at base, rounded apices.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Jul 2003 (1♀, genitalia slide NP602).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Statherotis sp. B

Figs. 14.4, 85.1

Description. *Head*: Lower frons orange white to pale orange mixed with dark brown dorsally, upper frons light brown; labial palpus with first segment brown with

white spot dorsally and ventrally, second segment pale orange becoming darker to greyish orange dorsoapically, mixed with dark brown spots dorsobasally, dorsomedially, ventroapically and apically, apical segment pale orange with dark brown dorsoapically; vertex greyish orange to brownish orange mixed with brown scales laterally.

Thorax: Pronotal collar orange red with greyish orange apices mixed with brown and dark brown; tegulae dark brown mixed with brownish orange basal half, apical half brownish orange to greyish brown; mesonotum light brown to brown with greyish orange apices, with two transverse dark brown strips, posterior scales tuft dark brown with ornage white apices. Forewing (Fig. 14.4): Length 6.86 mm in female (n=1); termen slightly concaved between R_5 and M_2; ground color and costal strigulae white to orange white, strigulae 1, 3-4 and 7 paired and separated by dark brown, strigulae 5-6 and 9 singled, strigulae 2 and 8 indistinct; basal patch distinct extending irregularly from costa between wing base and strigulae 3 to inner margin, dark brown mixed with brown, with greyish orange apices, separated by scales, orange white mixed with brown between Cu and 3A; median fascia extending from costa between strigulae 4 and 5 to inner margin, dark brown with some scales orange white apices, separated by white longitudinal strip mixed with brownish red strip between R and Cu, distal margin extending obliquely from costa to R_3, angled and extending to inner margin, area between median fascia and ocellus region with subtriangular patch between R_5 and inner margin, light brown mixed with brown; ocellus region with short, narrowed, longitudinal strip between M_1 and CuA_2 surrounding by orange white scales, area between ocellus region and outer margin with suboval patch, dark brown mixed with brown between M_2 and tornus; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside brown with yellowish grey on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 85.1): Sternum VII moderately sclerotized, posteromedially concaved, moderately dense scales throughout, without setae and microtrichia; tergum VIII without scales and setae, with moderately scaled and dense

microtrichia on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis short, densely microtrichiate; strigma sclerotized, cup-like, with dense microtrichia throughout, lower edge rounded, colliculum moderately long and slender; ductus seminalis arising from posterior 1/8 of ductus bursae, ductus bursae very long, slightly enlarged to corpus bursae; corpus bursae with two unequal signa, forming several combs of flat teeth, apices rounded, gradually decreasing in size.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Jan 2004 (1♀, genitalia slide NP605).

Remarks. Specimen was collected during the winter season at 195 m in mixed deciduous forest.

Statherotis sp. C

Figs. 47.1, 85.2

Description. Wing pattern poorly defined.

Male genitalia (Fig. 47.1): Tegumen high, narrowed, with dense setae along outer margin, ventroanteriorly with large rounded lobe; uncus moderately long, hooked, sparsely setose, apex rounded with densely setose; socii absent; gnathos arising from midlegth of tegumen, widened band-like, moderately sclerotized, dense microtrichia; anellus closely surrounding basal 1/3 of aedeagus; aedeagus short; cornuti absent; sacculus with moderately dense setae basally, median with small group of moderately dense setae near basal opening; neck indistinct; cucullus long, slightly curved, apex rounded, dense spines mixed with setae, especially cucullus basally to sacculus medially with different sizes of spines, except triangular lobe on outer margin apically with single short spine at apex, outer margin sparsely setose, with row of moderately dense setae from cucullus medially towards median area of sacculus.

Female genitalia (Fig. 85.2): Sternum VII broad, moderately sclerotized plate, posterior margin concave medially, densely scaled and sparsely setose; tergum VIII moderately dense scales posterior margin, except posteromedially, with moderately dense scales on triangular lateral extension posterior half, dense microtrichia; papillae anales densely setose, lateral setae with papillose bases; sterigma sclerotized with dense microtrichia, lower 2/3 thickened, upper narrowed towards lamella postvaginalis, verticled, subtriangular, pointed laterally, densely setose; ostium bursae with dense microtrichia; colliculum short and slender; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two unequal signa, pectination, teeth obtusely pointed, base broaded.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 6 Feb 2002 (1♂, genitalia slide NP194, 1♀, genitalia slide NP450).

Remarks. Specimens were collected during the winter season at 1,020 m in hill evergreen forest.

Statherotis sp. D

Figs. 14.6, 47.2, 85.3

Description. *Head*: Lower frons greyish orange, upper frons geryish orange mixed with light brown; labial palpus with first segment orange white mixed with brown, second segment pale orange mixed with brown ventrally, apical segment light brown mixed with pale orange; vertex light brown to brown with light orange apices.

Thorax: Pronotal collar brown with orange white apices; tegulae light brown to brown with orange white apices; mesonotum brown with orange white apices. Forewing (Fig. 14.6): Length 6.13 mm in male (n=1), 7.31 mm in female (n=1); male costal fold absent; termen concave between wing apex and CuA_1; ground color greyish orange intermixed with light brown; costal strigulae yellowish white, strigulae 1 indistinct, strigulae 2-9 paired and separated by dark brown, all fascia indistinct

suffused with ground color, wing with indistinct dark brown patch extending from wing base to midwing; ocellus region with diffuse dark brown dashes between R_4 and CuA_1; tornus with indistnct dark brown patch extending from tornus to CuA_1; wing apex with dark brown patch extending from wing apex to M_3. Underside light brown to brown with yellowish grey spots on costa between veins. Hindwing brown to dark brown dorsally, light brown ventrally, anal margin forming slightly sclerotized and swollen in male. Hindtibia dorsally in male with group of dense hair pencils, orange white extending from base to end of tibia.

Male genitalia (Fig. 47.2): Tegumen with arms, broaded, densely scaled laterally; uncus long, curved medially, projecting posteriorly, densely setose laterally, apex with moderately long, horn-like, pointed, projecting dorsally; socii arising from base of uncus, rather short, apex rounded, moderately dense setae; gnathos distinct, arising from near midlength of tegumen, sclerotized process, connected medially forming strongly sclerotized lobe, thickened medially, flattened apically, apex truncated, slightly concaved medially; anellus surrounding basal 1/3 of aedeagus; aedeagus short; cornuti absent; sacculus with group of moderately dense setae basally, ventromedial margin with moderately large group of dense, long setae, median with small lobe on basal opening margin, dense spiniform setae, dorsal with short, densely setose; neck short, slightly concaved, with dense setae on ventral margin; cucullus long, slightly concaved medailly, rounded at apex, densely setose, with dense spines along marginal area ventrally, ventrobasally with rounded lobe covered part of neck, with group of long, dense spines extending to sacculus dorsally.

Female genitalia (Fig. 85.3): Sternum VII with large, slightly sclerotized plate, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; sterigma developed, forming large, sclerotized plate, surrounding ostium bursae, disconnected posteromedially, reticulated throughout, anterior part extending over sternum VII posteromedially, with posterior margin extending pointed posterolaterally, each anterolateral area with small lobe, dense microtrichia; ostium bursae subovate, thickened margin, raised up, dense microtrichia, colliculum rather short, narrowed;

ductus bursae long; ductus seminalis arising near half of ductus bursae length; corpus bursae with two large, unequal elongate plate, scobinated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP177), 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♀, genitalia slide NP230).

Remarks. Specimens were collected during the winter season at 990-1,020 m in hill evergreen forest.

Statherotoxys Diakonoff, 1973

Statherotoxys Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 195. Type species: *Statherotoxys hypochrysa* Diakonoff, 1973.

Statherotyxys Razowski, 1977, Acta Zool. Cracov. 22: 284. [misspelling of *Statherotoxys*].

Statherotoxys has been defined by the following characters; forewing subtruncate, rather broad, costa little curved, apex obtuse. Antenna slightly thickened in male, subserrulate, shortly ciliate. Labial palpus rather long and slender, curved and ascending, basal segment roughish, median segment long, gradually curved, terminal segment porrect, short, obtuse. Hindtibia simple or strongly thickened with dense scales at the inner side forming a long projecting fringe above and a thick brush of modified broad scales below, a slender pencil from base above, appressed to inner side. Hindwing semioval, dorsum normal or with a downwards roll and with thickened, modified cilia. The male genitalia with high tegumen, uncus well-developed, slender and hooked, top sometimes truncate, socii rather large, bristly and porrect. Gnathos with arm strong along basal half, in middle with a thin but distinctly sclerotized upper raising single sclerite, diversely shaped. Valva slender and simply clavate, without the ventral prominence, a patch of weak hairs along inner edge of sacculus. Cucullus spines in a dense patch. Aedeagus moderate, anellus extended and

cup-shaped (Diakonoff, 1973) The genus includes 6 species worldwide. *Statherotoxys* includes 3 species have been desribed from Southeast Asia (Brown, 2005).

Statherotoxys sp. A

Figs. 47.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 47.3): Tegumen with arms moderately wide, with dense setae along the tegumen length; uncus narrowed basally, projecting dorsally, bilobed with two narrowed arms, pointed and curved at apex, densely setose; socii arising from tegumen dorsolaterally, rounded at apex, densely setose; gnathos arising from midlength of tegumen, completed band-like, sclerotized; anellus closely surrounding basal of aedeagus; aedeagus moderately wide, short, slightly curved medially; cornuti absent; juxta triangular, ventrally acuted; sacculus with group of dense setae basally, median with group of short spines on outer margin, dorsal sparsely setose; neck reduced; cucullus slightly curved with sparsely short spines on outer margin, with dense spiniform setae along valva between sacculus medially to apex of cucullus, apex rounded, slightly concaved near apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 6 Feb 2002 (1♂, genitalia slide NP178).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Sycacantha Diakonoff, 1959

Sycacantha Diakonoff, 1959, Ark. Zool. (2) 12: 181. Type species: *Phaecasiophora auriflora* Diakonoff, 1959 (=*Argyroploce hilarographa* Meyrick, 1933). [described as subgenus of *Phaecasiophora*].

Sycacantha has been defined by the following characters; medium-sized, broad-winged with smallish, curved, ascending palpi and usually strongly modified male hind tibia with long, white scales. Most species of *Sycacantha* are intricately mottled throughout and large. A series of horizontal, parallel black lines near wing tip enclosed by two narrow curved silvery fasciae running one from about 2/3 costa to tornus and the other from the same point around apex to anterior half of termen, is typical for many *Sycacantha* species. The broad tegumen with its paired dorsoanterior humps and deeply cleft socii, resulting in two pairs of quite dissimilar appendages, is diagnostic for *Sycacantha*. The female genitalia characterized by a long colliculum in an otherwise conspicuously granulate ductus bursae (Diakonoff, 1959 a, 1967). The genus includes 44 species worldwide. *Sycacantha* includes 32 species have been described from Southeast Asia (Brown, 2005). Diakonoff (1973) noted that two different host species were reared from leaves of Annonaceae in Java and larvae are leaf rollers.

Unplaced *Sycacantha*

Sycacantha sp. A

Figs. 14.7, 47.4

Description. *Head*: Upper and lower frons lossed scales; labial palpus with first segment orange ventral half, with orange red mixed with pale orange dorsal half, second segment light orange mixed with orange red, apical segment light orange; vertex pale orange mixed with brownish red.

Thorax: Pronotal collar orange white to light orange mixed with brownish red; tegulae pale red to pastel red mixed with brown basal 1/3, alternating with pale orange to light orange medially and apically; mesonotum orange white mixed with orange white to pale orange or pale red to pastel red; posterior scales tuft light orange mixed with pastel red. Forewing (Fig. 14.7): Length 8.01 mm in male (n=1); male costal fold absent; ground color orange white to light orange mixed with diffuse transverse striae, pale red to pastel red; termen rounded; costal strigulae orange white to pale

orange, strigulae 1-2 singled, strigulae 3-9 paired and separated by dark brown; basal fascia distinct near costa extending from costa to inner margin, brownish red mixed with dark brown; subbasal fascia incompleted distinct near costa extending irregular diagonally from costa to inner margin, curved outward medially, brownish red mixed with dark brown; median fascia indistinct present as dark brown spot on costa extending irregular diagonally from costa to inner margin, brownish red mixed with pale red, brownish orange and dark brown, broken by ground color, distal margin between base of R_5 and M_1 with elliptical white spot; transverse narrow line beyond median fascia, pale red, extending from costa to tornus; postmedian fascia with dash lines, dark brown, between R_2 to and tornus; outer margin with striae,dark brown mixed with orange, broken by white strigulae between R_5 and M_1 and between M_1 and M_2. Underside light brown with yellowish grey spots on costa and termen. Hindwing brown dorsally, inner margin formimg sclerotized shallow groove. Hindtibia with long white hair pencils dorsally, inner margin cover with dense white scales tuft, except dark brown hollow medially; first tarsus with white scales tuft at base.

Male genitalia (Fig. 47.4): Tegumen moderately wide, dorsolaterally rounded, with dense setae dorsally and basally, moderately dense medially; uncus short, rounded at apex with dense scales dorsally; socii pendant from base of uncus, inner socius rather short, tubular like, acute at apex, with 3-4 spiniform setae at apex, outer socius larger, subtriangular lobe, rounded at apex, with moderately dense setae apically; gnathos arising from near middle of tegumen, moderately sclerotized with two arms projecting ventrally to anellus; anellus closely surrounding 1/3 of aedeagus, opening ventrally; aedeagus rather short, moderately wide with dense cornuti; juxta triangular; sacculus with moderately dense, long mixed with short setae, ventromedially with dense spiniform setae between basal opening and neck, dorsally with group of moderately dense, long mixed with short setae; neck moderately concave, with sparsely hair-like setae medially; cucullus enlarged basally, slightly narrow to apex, round at apex, dense spiniform setae, except outer margin, ventrobasally with one large spine on margin, outer margin with long, sparsely setose, inner margin with long, sparsely setose apically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Jan 2004 (1♂, genitalia slide NP688).

Remarks. Specimen was collected during the winter season at 195 m in mixed deciduous forest.

Sycacantha sp. B

Figs. 14.8, 48.1

Description. *Head*: Upper frons dark brown to black, lower frons orange white; labial palpus with first segment brown to dark brown with white dorsally, second segment brown to dark brown basal half, apical half with a wide brown strip dorsally, apical segment brown basally with orange white apically; vertex pale orange mixed with dark brown anteriorly and laterally.

Thorax: Pronotal collar orange white to pale orange mixed with dark brown; tegulae orange white to pale orange mixed with orange to brownish orange; mesonotum orange white. Forewing (Fig. 14.8): Length 7.25 mm in male (n=2); male costal fold absent; termen straight; ground color orange white to pale orange mixed with diffuse greyish orange; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch indistinct present as subquadrate spot basomedially of wing length, greyish orange to brownish orange mixed with dark brown; median fascia distinct on costa, rhomboidal-shaped extending from costa to R_3, brownish orange mixed with dark brown, strigulae 6 with silvery striae extending diagonally from costa to tornus, and orange white striae beyond silvery striae; postmedian fascia distinct extending diagonally from costa to outer margin at between CuA_1 and CuA_2, dark brown mixed with brownish orange, strigulae 6-8 with distinct silvery striae extending from costa, confluence and extending diagonally to outer margin between M_1 and M_2, wing apex dark brown; outer margin with distinct dark brown striae, broken by indistinct white strigulae between M_1 and M_2 and between M_2 and M_3. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin sclerotized basal half. Hindtibia with

dense white sclaes tuft, inner with dense hairs pencil dorsally extending from base of tibia to apical 1/3, light brown basal 2/3, pale orange apically.

Male genitalia (Fig. 48.1): Tegumen moderately high, narrow ventrally, swollen dorsolaterally, dense scales along margin, anterior margin sclerotized, subtriangular basoanteriorly; uncus round, slightly concave medially, with dense microtrichia; socii pendant from base of uncus, inner socius moderately long, cylindrical, with sparse setae outer margin, densely setose apices; outer socius little shorter, oval, densely setose apically; gnathos slightly sclerotized, band-like; anellus surrounding basal 1/4 of aedeagus, extending connected to gnathos; aedeagus moderately long and wide, with 13 cornuti; juxta triangular; caulis moderately long; sacculus with group of long, sparsely setose basally, ventromedially to neck with group of dense spiniform setae intermixed with short setae, basal opening margin medially with small lobe, bearing moderately dense setae, dorsomedially with group of long and short setae; neck moderately incised; cucullus extended basally and narrowed to apex, with short spines from basal to near apex, except outer margin from basal 1/3 to apex without spine, with moderately dense setae, basolaterally with one strongly short spine on outer margin, apex with dense setae on inner margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 22 Oct 2003 (1♂, genitalia slide NP746), 14°40'03"N 98°36'07"E, 23 Oct 2003 (1♂).

Remarks. Specimens were collected during the late of rainy season at 180-745 m in mixed deciduous forest and montane evergreen forest.

Sycacantha sp. C

Figs. 15.1, 48.2, 85.4

Description. *Head*: Upper frons with dark brown scales mixed with brownish orange scales, lower frons with short orange white scales; labial palpus with first segment white to yellowish white, second segment yellowish white to orange white

ventrobasally, with oblique brown mixed with dark brown from dorsobasally area to ventroapically area with pale orange spot near apex, apical segment dark brown, metallic dark green when viewed with angle to light; vertex pale orange to greyish orange, mixed with brown and dark brown posteriorly.

Thorax: Pronotal collar dark brown mixed with brownish orange posteriorly; tegulae dark brown basally with pale orange intermixed with brownish orange and dark brown; mesonotum pale orange to light orange mixed with brownish orange, posterior tufts with pale orange mixed with brownish orange. Forewing (Fig. 15.1): Length 8.68 mm in male (n=4), 9.95 mm in female (n=1); male costal fold absent, termen convex; ground color and costal strigulae orange white to pale orange; strigulae 1 and 2 present irregularly as three spots, separated by dark brown, strigulae 3-9 paired and separated by dark brown; basal patch present as diffuse dark brown from costa to inner margin at base; median fascia extending diagonally from costa between strigulae 4 and 5 to inner margin, brownish orange mixed with brown and dark brown; postmedian fascia distinct extending diagonally from between strigulae 6 and 7 to outer margin at between M_2 and M_3, brownish orange line extending diagonally from between strigulae 7 and 8 and between strigulae 8 and 9 to outer margin at between R_5 and M_1, white small spot in middle of wing near outer marginal median fascia; between basal patch to inner margin of median fascia with diffuse transverse line, from costa to inner margin, brownish orange mixed with greyish brown scales, ocellus region orange white from R_2 to tornus, enclosing by dark brown, irregular longitudinal line between R_5 to CuA_2, outer marginal scales dark brown except terminal strigulae between R_5 and M_1, M_1 and M_2 and between M_2 and M_3. Underside light brown with pale orange on costa. Hindwing brown dorsally, anal margin slightly upward folded with orange white hair scales. Hindfemur with white scales tuft extending form base to apex enclosing hair pencil arising from base and extending to midlength, basally black, outer concolorous orange white thoughout length.

Male genitalia (Fig. 48.2): Tegumen wide with anterior margin sclerotized, densely setose, basoanteriorly with margin pointed and sclerotized; uncus reduced as

rounded lobe, densely setose; socii bilobed, arising form base of uncus, one board, rounded lobe, densely setose, other smaller rounded lobe with moderately setose; gnathos arising from half of tegument, sclerotized band, anellus not closely surrounding at base of aedeagus, cub-like; aedeagus wide and short; cornuti absent; juxta triangular, ventrally rounded; sacculus with setae mixed with spiniform setae basally to medially, rounded lobe on costa with very long setae mixed with short setae; neck slightly concave with setae on margin, cucullus long, curved with densely spines.

Female genitalia (Fig. 85.4): Sternum VII lightly and evenly sclerotized; tergum VIII with scales and setae on posterior margin, papillae anales width 0.31 of length relative wide medially, moderately setose, lateral setae arising from papillose bases; sterigma reduced, light sclerotized lamella postvaginalis concaved with microtrichia, setae absent, lamella antevaginalis forming wide rim extending posteriorly to enclose lamella postvaginalis; ductus with antrum forming sclerotized both sides, ductus bursae very long 3.8 of tergum VII length; ductus seminalis arising from 1/7 of ductus bursae length, signa short with wide base and apical pointed.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 5 Nov 2002 (4♂, genitalia slide NP389, 1♀, genitalia slide NP472).

Remarks. Specimens were collected during the winter season at 935 m in hill evergreen forest.

Sycacantha sp. D

Figs. 15.2, 48.3

Description. *Head*: Upper frons with brownish orange scales, lower frons lose scales; labial palpus with first segment orange white mixed with brownish orange scales; second segment pale orange mixed with dark brown basally, apical segment pale orange basally, light brown medially and orange white at apex; vertex orange

white mixed with brownish orange and dark brown, metallic dark green when viewed at angle to light.

Thorax: Pronotal collar dark brown mixed with orange white and pale red; tegulae dark brown mixed with pale orange; mesonotum dark brown mixed with pale orange posteriorly. Forewing (Fig. 15.2): Length 6.67 mm in male (n=1); male costal fold absent; ground color and costal strigulae orange white; strigulae 1-9 paired and separated by dark brown spots; subbasal fascia extending diagonally from costa between strigulae 2 and 3 to inner margin, dark brown intermixed with brownish orange; median fascia irregular extending diagonally between strigulae 4 and 5 to inner margin, brown mixed with dark brown; postmedian fascia extending from costa between strigulae 6 and 7 to outer margin at M_2, dark brown; ocellus region pale orange between R_5 to CuA_2, with dark brown irregular longitudinal line between M_1 and M_2, outer margin with distinct dark brown striae. Underside light brown with yellowish grey on costa. Hindwing brown dorsally, anal margin slightly curved upwardly. Metafemur with white scales tuft extending from base to apex, enclosing two types of hair pencil arising from femural base and extending to midlength, basal half orange white; apical half white, other pale orange with basally black and apically orange grey.

Male genitalia (Fig. 48.3): Tegumen wide, dorsally rounded, anterior margin sclerotized, densely setose anteriorly; uncus reduced as rounded lobe; socii bilobed, arising from base of uncus, one board, rounded lobe with sparsely setose, other smaller, pointed with sparsely setose; gnathos arising from half of tegumen length; sclerotized band connected, anellus closely surrounding 1/3 at base of aedeagus; aedeagus wide, moderately long, curved, dense cornuti; juxta triangular truncated ventrally; sacculus with long setae basally, outer margin medially with very long spiniform setae, sacculus medially with densely setose, sparsely setose inner margin, apically with group of very long setae mixed with short setae; neck slightly incised, cucullus with basal angle elongate beyond neck; densely setose with setae extending diagonally over middle of neck.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 15 May 2002 (1♂, genitalia slide NP414).

Remarks. Specimen was collected during the summer season at 935 m in hill evergreen forest.

Sycacantha sp. E

Figs. 15.3, 49.1

Description. *Head*: Lower frons orange white, upper frons greyish orange mixed with dark brown; labial palpus with first segment dark brown mixed with white apically, second segment dark brown with orange white spot ventroapically, orange white apically, apical segment dark brown with orange white at apex; vertex pale orange to greyish orange intermixed with dark brown.

Thorax: Pronotal collar dark brown mixed with orange white to pale orange; tegulae orange white to pale orange intermixed with light brown and dark brown; mesonotum orange white to pale orange mixed with dark brown. Forewing (Fig. 15.3): Length 7.5 mm in male (n=1); male costal fold absent, termen rather straight; ground color orange white mixed with diffuse transverse dark brown striae; costal striguale white, strigulae 1-9 paired and separated by dark brown; basal patch distinct extending from costa between wing base and strigulae 2 to inner margin, dark brown intermixed with orange white to pale orange; median fascia indistinct slightly dark brown, with darkest brown scales on costa between strigulae 4 and 5, forming subtriangular pretornal spot on inner margin, strigulae 5 with silvery striae extending obliquely beyond distal margin of median fascia area, becoming large to tornus, with longitudinal strip and spot, dark brown forming cresent-shaped extending between R_2 and tornus, strigulae 7 with silvery striae extending obliquely to outer margin; preterminal fascia extending from costa between strigulae 8 and 9 to outer margin, brown mixed with dark brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally. Hindtibia with

white scales tuft mixed with long, white hair pencils extending over a large group of long, dense hair pencils, greyish orange with dark brown 1/4 basally.

Male genitalia (Fig. 49.1): Tegumen moderately wide, slightly narrow medially, swollen dorsolaterally, anterior margin sclerotized, with dense scales dorsoanteriorly and basoanteriorly, moderate medially; uncus bifurcated, pointed at apex, slightly concave dorsomedially; socii pendant from base of uncus, inner socius rather short, clavate, with long, densely setose apices; outer socius larger, ovate, moderately dense setae apically; gnathos arising from near midlength of tegumen, slightly sclerotized, band-like, median with two arms projecting ventrally connected to anellus; anellus surrounding basal 1/3 of aedeagus; aedeagus moderately long and wide, without cornuti; juxta triangular; caulis moderately long; sacculus with group of long, moderately dense setae basally, ventromedially to neck with group of dense spiniform setae intermixed with short setae ventroapically; basal opening with small lobe, bearing moderately dense setae on margin, dorsomedially with group of long mixed with short setae; neck moderately incised; cucullus extended basally and narrowed to apex, with short spines from basal to near apex, except outer margin from basal 1/5 to apex, with moderately dense setae, basolaterally with one strongly short spine on outer margin, apex with dense setae on inner margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂, genitalia slide NP588).

Remarks. Specimen was collected during the late of rainy season at 750 m in hill evergreen forest.

Sycacantha sp. F

Figs. 15.4, 85.5

Description. *Head*: Lower frons orange white mixed with light brown to brown, upper frons dark brown mixed with short scales, pale orange laterally; labial palpus with first segment orange white, mixed with dark brown ventrally, second

segment orange white with dark brown strip dorsomedially and ventroapically, apical segment dark brown with light brown ventral half; vertex dark brown intermixed with greyish orange.

Thorax: Pronotal collar, tegulae and mesonotum dark brown intermixed with greyish orange. Forewing (Fig. 15.4): Length 9.22 mm in female (n=1); termen slightly concaved between R_5 and M_2; ground color orange white to pale orange mixed with diffuse transverse dark brown striae; costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; fasciae indistinct, sclaes in area of basal patch and medain fascia slightly darker brown, with darkest brown scales forming subtriangular spot at tornus, strigulae 5 with silvery striae extending obliquely beyond distal marginal area of median fascia, becoming large to tornus, strigulae 6 and 7 fused with patch extending obliquely to tornus, area between veins from R_3 to CuA_2 with dark brown strip surrounding with pale orange to greyish orange scales, strigulae 7 with silvery striae extending to outer margin; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 85.5): Sternum VII with moderately sclerotized plate, deeply excavation posteromedially, rounded, moderately dense scales, becoming more dense posterolaterally, posteromedially near ostium scaleless; tergum VIII without setae or scales dorsomedially, with moderately dense scales on lateral triangular extension; papillae anales with dense setae, lateral setae with papillose bases; sterigma reduced; ostium bursae beneath sternum VII, antrum forming a round, sclerotized cup, with dense microtrichia on inner margin and sternum VII excavation, colliculum moderately long, sclerotized, ductus seminalis arising from posterior 1/3 of ductus bursae; ductus bursae long; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 25 Oct 2003 (1♀, genitalia slide NP589).

Remarks. Specimen was collected during the late of rainy season at 195 m in mixed deciduous forest.

Teleta Diakonoff, 1966

Teleta Diakonoff, 1966, Zool. Verh. Leiden 85: 71. Type species: *Olethreutes talaris* Durrant, 1915.

Teleta has been defined by the following characters; antenna slightly thickened, fasciculate-ciliated. Labial palpus rather long, ascending, dilated, rough along lower edge, terminal segment concealed, obtuse. Hindtibia flattened laterally, strongly dilated by long bristly scales, a grey pencil from base 3/4 along tibia. Hindwing with oval patch of androconia on upper side, dorsum with a slight fold on underside. The male genitalia with high tegumen, uncus long, clavate, curved, sometimes bilobed, socii parietal or absent, with a membranous band gnathos. Valva with a pointed triangularly projecting sacculus and an obliquely clavate cucullus. In female genitalia with a sterigma conical, with a median split, lower end dilated into a round ostium with a thickened edge. Colliculum moderate, with two moderate pectinations signa (Diakonoff, 1966, 1973). The genus includes only one species worldwide that has been described from Southeast Asia (Brown, 2005).

Teleta talaris (Durrant), 1915

Figs. 15.5, 49.2

Olethreutes talaris Durrant, 1915, Lepid. Br. Ornith Union & Wollaston Exp. 2 (15): 155. Type locality: Dutch New Guinea (Utakwa R.). Holotype (♂): BMNH.

Argyroploce xanthogastra Meyrick, 1921, Zool. Meded. 6: 156. Type locality: Indonesia (West Java, Sindanglaya). Lectotype (♂): RMNH.

Description. *Head*: Upper frons light brown to dark brown mixed with pale orange scales, lower frons with short, orange white scales; labial palpus with first

segment orange white scales, second segment orange white, alternate with distinct dark brown medially and apically, apical segment dark brown dorsal half and orange white to pale orange ventrally; vertex pale orange mixed with light brown and dark brown.

Thorax: Pronotal collar light brown, tegulae light brown to brown mixed with pale orange and dark brown; mesonotum pale orange mixed with brown anteriorly and dark brown strip at the middle, posterior tufts brown and dark brown. Forewing (Fig. 15.5): Length 7.75 mm in male (n=1); male costal fold absent; ground color pale orange intermixed with brownish orange to brown and brownish red, costal strigulae pale orange; strigulae 1-9 paired and separated by dark brown; subbasal fascia extending from costa between strigulae 2 and 3 to inner margin, almost distinct on casta, dark brown, median fascia extending irregularly from costa between strigulae 4 and 5 to inner margin, dark brown; ocellus region with large spot between M_3 and CuA_2, outer margin with distinct dark brown striae; broken by strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3 and between CuA_1 and CuP. Underside light brown with pale orange spots on costa and between veins on outer margin. Hindwing brown dorsally with small patch of sex scales, dark brown at the middle of wing between Cu and CuA_1, ventrally light brown.

Male genitalia (Fig. 49.2): Tegumen narrow, dorsally rounded, moderately setose; uncus developed, projection as rounded lobe apically, densely setose apically and group of moderately scales basally; socii reduced, with sparsely setose; gnathos arising from tegumen half, forming membranous band, anellus closely surrounding at base of aedeagus, dorsally separated as bilobed; aedeagus short and wide, cornuti absent; sacculus with moderate setae basally, medially with triangular lobe, rounded at apex elevated beyond neck bearing moderately short spines, truncated apically and densely long spines; neck slightly concaved with sparsely setose; cucullus deeply notched medially with dorsal portion forming rounded lobe, densely setose, and ventral portion forming digitate, pointed at apex, densely setose ventral half.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP106).

Distribution. Thailand and Java.

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Temnolopha Lower, 1901

Temnolopha Lower, 1901, Trans. R. Soc. S. Austral. 25: 72. Type species: *Temnolopha mosaica* Lower, 1901.

Temnolopha has been described by the following characters; medium-sized, usually with unmistakable, contrasting and strongly sinuate wing marking, grey and brown and with long palpi with a conspicuous pointed apex. The wing venation of the genus is typical for an Olethreutini, but the smaller accessory cell with the chorda from between R_2 and R_3. The male genitalia are characterized by tegumen with a clavate and ventrally bristled uncus, by large, flattened, drooping socii and by often asymmetrical valvae. The single signum of *Temnolopha*, a patch of scobination with larger central teeth and one or two enlarged shark-tooth-shaped sclerites (Diakonoff, 1973). The gunus includes 5 species worldwide. *Temnolopha* includes 3 species have been described from Southeast Asia. Diakonoff (1973) stated that *T. mosaica* is a rather polyphagous species and mentions on Zingiberaceae from central Java.

Temnolopha matura Diakonoff, 1973

Figs. 15.6, 49.3

Temnolopha matura Diakonoff, 1973, Zool. Monogr. Rijksmus. Nat. Hist. 1: 322. Type locality: Indonesia (East Borneo, Tabang, Bengen River). Holotype (♀): RMNH.

Description. *Head*: Upper frons greyish orange, lower frons greyish red mixed with light brown; labial palpus with first segment orange white, second segment enlarged apically, orange white to pale orange mixed with dark brown medially, apical segment light brown; vertex greyish orange mixed with brown and dark brown.

Thorax: Pronotal collar light brown to brown; tegulae basal half white mixed with reddish white medially surrounding with brown and dark brown, apical half light brown; mesonotum with short scales anterior 2/3, greyish orange to brownish orange with posterior margin V shaped pointed anteriorly and large scales along V-shaped margin, posterior 1/3 including posterior scales tuft, brown to dark brown. Forewing (Fig. 15.6): Length 8.92 mm in male (n=2); male costal fold absent; termen slightly concaved between R_5 and M_3; ground color orange white to orange grey; costal strigulae 1-9 paired and separated by dark brown; basal patch indistinct, present as dark brown spot on costa, with longitudinal strip between Sc and R, basal 1/3 of forewing length, and large subtriangular spot, dark brown on inner margin; median and postmedian area between strigulae 4 and 7 broken by greyish brown striae, curved, present as two large spots, brown mixed with dark brown, extending from costa to Cu, indistinct on inner margin; pretornal triangular spot extending from inner margin to M_3, greyish brown with brown on margin; ocellus region with large patch, cresent-shaped dark brown, apical 1/4 and from R_5 to between CuA_1 and CuA_2; wing apex dark brown. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, anal fold sclerotized with dense scales tuft on anal area and along inner margin, greyish orange mixed with orange white, ventral light brown. Hindtibia with dense scales tuft, light brown to brown dorsally.

Male genitalia (Fig. 49.3): Tegumen high, moderately broad, widened apically, concave near apically, with dense scales dorsoanteriorly and along outer margin; uncus long, basal enlarged slightly tapering to apex, apex rounded, sparse setae basal 2/3, apical 1/3 with moderately dense spines; socii large, apex rounded, pendant from apicolaterally of tegumen, densely setose; gnathos arising from dorsal 1/3 of tegumen, narrowed, band-like, sclerotized; anellus closely surrounding basal of aedeagus;

aedeagus long, taper to apex, dorsoapical 1/5 with small sclerotized lobe, rounded at apex; valva unequal, broad; sacculus larger than cucullus, left sacculus larger then right, left sacculus with moderately dense setae basally and ventrobasal margin, ventromedially with group of dense, flat and long setae, without in right, basal opening margin medially with small subtriangular lobe, acute at apex, dorsal with two groups of moderately long and dense, strong spines, upper group stout at apex, lower group pointed at apex, with dense setae from dorsobasally of sacculus to ventrobasally of cucullus, without in right; neck indistinct in left; cucullus large, taper to apex, rounded at apex, dense spines with densely setose at apex, outer margin with sparse setae, ventrobasally with group of moderately long and dense spines, pointed at apex in left.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 6 Feb 2002 (1♂, genitalia slide NP190), 14°35'08"N 98°38'20"E, 18 Apr 2002 (1♂, genitalia slide NP325).

Distribution. Thailand and Borneo.

Remarks. Specimens were collected during the late of winter season to the summer season at 220-1,020 m in mixed deciduous forest and hill evergreen forest.

Thysanocrepis Diakonoff, 1966

Thysanocrepis Diakonoff, 1966, Zool. Verh. Leiden 85: 45. Type species: *Argyroploce crossota* Meyrick, 1911.

Thysanocrepis has been defined by the following characters; broad-winged, moderately large to large moth with long, sinuate, labial palpi. They are easily recognized by the shape and pattern of suffused greyish ochreous to grey, forewing characterized by a strongly sinuate costa with a conspicuous blackish triangle in its concave central portion as part of a series of small blackish marks along the costa, the male has the anal margin rolled upwardly concealing a long scale pencils from a small

lobe at base of the hindwing. The genitalia in both sexes are diagnostic for the genus. The male genitalia are characterized by a hairy, cone-shaped and distally notched uncus in combination with elongate, pendulous socii and without any trace of a gnathos, narrow valvae with a twice deeply emarginated ventral margin with a sclerotized, distally projecting, bristled sacculus followed by a bristled, tounge-shaped medial process with a blunt apical thorn and a widened, truncate apex at the valva, and by a short, wide aedeagus with an oblique apex and a large bunch of minute cornuti. The female genitalia are characterized by a spinulose sterigma ventrally to the ostium, a transverse sclerite with a deep V-shaped emargination in its hindmargin, and by two unequal-sized signa of unique shape, the smaller one with a cone-shaped base and a crescentic top with a jagged inner surface, the larger one with a more cylindric base and the top an open semi-cylinder widening towards a deeply jagged rim (Diakonoff, 1966). The genus includes 2 species worldwide that have been described from Southeast Asia (Brown, 2005).

Thysanocrepis crossota (Meyrick), 1911

Figs. 15.7, 49.4, 85.6

Argyroploce crossota Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 366. Type locality: New Guinea (Solomon Islands, Bougainville). Lectotype (♂): BMNH.

Description. *Head*: Upper frons orange white long scales and dark brown posteriorly, lower frons yellowish white short scales; labial palpus with first segment orange white, second segment orange white to greyish orange mixed with dark brown, apical segment dark brown at base with orange white apex; vertex dark brown and orange white apices some scales posteriorly, orange white short scales posteriorly to chaetosemata and row of orange white posteriorly to eye.

Thorax: Pronotal collar pale red, tegulae orange white to greyish orange; mesonotum greyish orange to light brown intermixed with dark brown basally. Forewing (Fig. 15.7): Length 7.6 mm in male (n=1), 7.9 mm in female (n=1); male

costal fold absent, costal margin concave at middle; termen slightly concave near apex; ground color and costal strigulae yellowish white to orange white intermixed with brown striae; costal strigulae 1 and 2 present by three spots at base, strigulae 3 and 4 paired and separated by slightly dark brown, strigulae 5-7 paired and separated by dark brown mixed with brownish, strigulae 8 and 9 singled; subbasal fascia present on costal margin between strigulae 2 and 3, extending diagonally to the base of Cu; median fascia present on costal margin between strigulae 4 and 5, extending to the middle of R_1 and brown umbrae diffuse to the inner margin; postmedian fascia present distinct at costal margin between strigulae 6 and 7, dark brown fascia extending from between strigulae 7 and 8 to outer margin between R_5 and M_1 extending along the outer margin to CuA_1, dark brown umbrae diffuse at outer 1/4 of wing outer margin scales brown except for yellow white terminal strigulae between R_4 and R_5, R_5 and M_1, M_1 and M_2. Hindwing brown, cubital pectin or hair pencil at base of Cu in male.

Male genitalia (Fig. 49.4): Tegumen wide and flat, moderately scales and setae; uncus absent; socii triangular pending from base of uncus, basally 1/3 covered with microtrichia apical 2/3 with sparse long setae on rounded apices; gnathos absent, anellus closely surrounding basal 1/3 of aedeagus, aedeagus moderately wide at base and the middle; deciduous dense short cornuti 2/3 of aedeagus length; juxta triangular with truncate ventrally; valva with sclerotized lobe near middle of sacculus and longer sclerotized lobe between sacculus and neck, dense setae on sacculus ventrally with moderate setae inner margin; neck with moderate setae close to ventral margin that deeply incised ventrally, cucullus with dense long setae.

Female genitalia (Fig. 85.6): Sternum and tergum VII densely scales, sparsely setose; tergum VIII moderately dense scales except medially, with dense scales on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis rudimentary; lamella antevaginalis forming sclerotized patch, deeply excavation posteromedially, with dense microtrichia; antrum forming sclerotized, suboval-shaped; colliculum small encircling ductus bursae near antrum; ductus seminalis originating from near corpus bursae opening; corpus bursae with two

asymmetrical signa; smaller signum flattened, subrhomboidal-shaped, oblong at base, larger signa irregular, rounded at base.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'01"N 98°27'28"E, 19 Jun 2002 (1♂, genitalia slide NP444), 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP468).

Distribution. Thailand, Solomon Is. and New Guinea.

Remarks. Specimen was collected during the summer season at 380-745 m in riparian forest and hill evergreen forest.

Unplaced Olethreutini

Genus A sp. A

Figs. 15.8, 86.1

Description. *Head*: Lower frons yellowish white, upper frons pale orange; labial palpus with first segment dark brown, second segment dark brown with yellowish white apically, apical segment yellowish white; vertex dark brown.

Thorax: Pronotal collar dark brown; tegulae dark brown with greyish yellow medially; mesonotum dark brown intermixed with light brown, posterior scales tuft dark brown. Forewing (Fig. 15.8): Length 4.81 mm in female (n=1); termen very slightly concave between wing apex and M_3; ground color yellowish white; costal strigulae yellowish white, strigulae 1, 2, 5 and 6 indistinct suffused with ground color, strigulae 3, 4 and 7-9 paired and separated by dark brown; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, dark brown, distal margin broken by greyish yellow; strigulae 3 and 4 with metallic yellowish white scales extending from costa to inner margin; median fascia fused with postmedian fascia present as irregular dark brown patch extending from costa diffuse to inner margin; preterminal fascia present as dark brown spot on casta extending

from costa to R_4; wing apex dark brown; ocellus region with distinct metallic yellowish white on tornus, diffuse on outer margin, costa and near median patch; outer margin with terminal strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 86.1): Sternum VII with large, moderately sclerotized plate, densely scaled; tergum VIII sparsely setose posteriorly, triangular lateral extensions densely scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; sterigma developed, forming large, sclerotized plate, narrowed anteriorly, dilated as rounded lobe posterolaterally, dense microtrichia, except laterally; ostium bursae present at posteromedial margin of sterigma, dense microtrichia, anterior margin concaved medially, ductus bursae with antrum, rather short, sclerotized, funnel-shaped; ductus seminalis indistinct; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 13 Sep 2002 (1♀, genitalia slide NP456).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Genus B sp. A

Fig. 50.1

Description. Wing pattern poorly defined.

Male genitalia (Fig. 50.1): Tegumen subtriangular, with arms, moderately broad, densely scaled laterally, apicolaterally with moderately dense, long setae; uncus absent; socii difficult to defined; gnathos arising from midlength of tegumen, completed band-like, sclerotized, widened, especially medially; anellus cup-like, surrounding basal 1/4 of aedeagus; aedeagus long and slender, slightly widened medially; cornuti absent; valva thickened; sacculus with moderately dense, long setae

medially, ventromedial margin with group of dense setae; neck indistinct; cucullus with basal part enlarged, ventral surface strongly concaved, with group of long, curved, dense setae, and small lobe with long spines at top, slightly rotated basally, anterior part with ventral margin slightly sinuated, connected with basal opening margin dorsally, wrinkled, dense spines, posterior part forming large, rounded lobe, smooth, apical part of cucullus moderately long, tubular, slightly narrowed to apex, rounded at apex, dense spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP518).

Remarks. Specimen was collected during the winter season at 990 m in hill evergreen forest.

Genus C sp. A

Figs. 16.1, 50.2

Description. *Head*: Lower frons yellowish white, upper frons pale orange; labial palpus with first segment yellowish white, second segment yellowish white with dark brown spot dorsomedially, apical segment yellowish white; vertex dark brown.

Thorax: Pronotal collar brown to dark brown mixed with greyish orange; tegulae brown mixed with dark brown and greyish orange basally; mesonotum dark brown. Forewing (Fig. 16.1): Length 4.81 mm in male (n=1); male costal fold absent; termen straight; ground color brownish grey with metallic when viewed at angle to light; costal strigulae yellowish white, strigulae 1- 2 and 5-6 single, strigulae 3-4 and 7-9 paired and separated by dark brown; basal fascia with irregular line extending from costa to inner margin, dark brown; subbasal fascia distinct extending from costa to inner margin, slightly curved medially, brown mixed with dark brown with yellowish white on distal margin; median fascia extending distinct from costa irregular to inner margin, dark brown mixed with yellowish white on proximal margin between R vein and inner margin, distal margin extending irregularly from costa to

inner margin; postmedian fascia extending obliquely from costa to outer margin, dark brown mixed with brown; wing apex dark brown; pretornal subtriangular spot extending from inner margin to M_2; outer margin with terminal white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally. Hindtibia with group of hair pencil on inner margin, dark brown extending from base of tibia to apicoposterior 1/3.

Male genitalia (Fig. 50.2): Tegumen with arms, moderately broad, moderately dense scales laterally, basoaterior half of tegumen with lobe; uncus reduced forming wide, subtriangular lobe on tegumen apically; socii with large plate-shaped, arising from tegumen apicolaterally, extending to near midlength of tegumen, densely setose; gnathos arising from midlength of tegumen, completed band-like; anellus closely surrounding basal half of aedeagus; aedaegus short, narrowed to apex; valva long, apical half narrowed, slightly dilated apically; sacculus with moderately dense setae basally to ventromedially, median with group of sparse setae, ventral surface between sacculus and cucullus deeply incised forming deeply groove, widened, narrowed to near half of cucullus length; neck indistinct; cucullus long, rounded at apex, dense spiniform setae, basoanterior part forming subtriangular lobe, with long, moderately dense spines on margin, basoposterior part with small group of long spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂, genitalia slide NP394).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

TRIBE ENARMONIINI

Anathamna Meyrick, 1911

Anathamna Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 261. Type species: *Anathamna ostracitis* Meyrick, 1911.

Anathamna has been defined by the following characters; ochreous to brownish with dark greyish hindwings and subtriangular forewings with usually slightly sinuate costa and sinuate termen. R_4 and R_5 are stalked in the forewing, the hindwing has a small projecting lobe at the base of the anal region in male. Male have two symmetrical patchs of modified scales on the posterior surface of metathorax and two opposite on the base of abdomen, and a scale pencil from the base of the inner surface of the hind tibia. In male genitalia, distal portion of the valva is usually broader, more triangular, the pencil thorn is bipronged and a tuft of bristles from a protuberance on the ventral margin towards the valva neck is diagnostic for the genus. The female with the combination of a very large sclerite with one or two large horns at the entrance of corpus bursae and two horn-shaped signa, both in the center of corpus bursae (Diakonoff, 1966). The genus includes 7 species worldwide and is most diverse in the Oriental region. *Anathamna* includes 3 species that have been described from Southeast Asia (Brown, 2005).

Anathamna spermatophaga Diakonoff & Bradley, 1976

Figs. 16.2, 50.3

Anathamna spermatophaga Diakonoff & Bradley, 1976, Bull. Ent. Res. 66: 401. Type locality: Papua New Guinea (Moresby District, Bulolo). Holotype (♂): BMNH.

Description. *Head*: Lower frons orange white to pale orange, upper frons brownish orange to light brown mixed with dark brown; labial palpus with first segment orange white, second segment orange white to brownish orange, with dark

brown strip dorsomedially, dark brown apically, apical segment short, dark brown; vertex brownish orange to light brown.

Thorax: Pronotal collar dark brown; tegulae dark brown alternating with narrow strip, light brown; mesonotum dark brown alternating with transversely strip, light brown. Forewing (Fig. 16.2): Length 5.9 mm in male (n=1); male costal fold absent; termen slightly concave between R_5 and M_2; ground color greyish brown, costal strigulae orange white, strigulae 1 and 6-9 singled, strigulae 2-5 paired and separated by dark brown; basal patch indistinct, distal margin irregular, dark brown mixed with diffuse greyish orange spots; median fascia distinct extending diagonally from costa between strigulae 4 and 5 to R and extending obliquely as diffuse to inner margin near tornus, dark brown mixed with greyish orange; ocellus region with six black spots between M_1 and tornus, surrounding with light brown scales, strigulae 3-9 with grey striae, above ocellus region with longitudinal strip, cresent-shaped, dark brown extending from distal margin of median fascia to outer margin; outer margin with distinct dark brown line, broken by greyish orange strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2. Underside light brown with white spots on costa and outer margin between veins. Hindwing brown dorsally, ventrally light brown.

Male genitalia (Fig. 50.3): Tegumen with arms, moderately broad, moderately dense setae laterally; uncus moderately long, projecting apically, slightly narrowed to apex, constricted apicomedially, apically with dense, long, curved spiniform setae, densely setose laterally; socii and gnathos ill-defined; anellus closely surrounding basal of aedeagus; aedeagus widened, moderately long, paralleled margins, dilated at apex; cornuti dense, long; sacculus with large group of long, dense spiniform setae ventromedially, median with smaller group of long, dense spiniform setae between basal opening and cucullus basally; neck indistinct; cucullus short, dorsally and dorsoapically rounded, with dense, long spiniform setae apically, ventroapically with distinct, single, short spine, and moderately large, subrectangular lobe, dense spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Dec 2003 (1♂, genitalia slide NP585).

Distribution. Thailand (new record) and New Guinea.

Remarks. Specimen was collected during the winter season at 195 m in mixed deciduous forest.

Unplaced *Anathamna*

Anathamna sp. A

Figs. 16.3, 50.4

Description. *Head*: lower frons orange grey, upper frons light brown; labial palpus with first segment yellowish white, second segment dark brown with greyish orange patch dorsomedially, apical segment dark brown with orange white apex; vertex brownish orange to light brown.

Thorax: Pronotal collar greyish orange mixed with dark brown; tegulae orange white to pale orange mixed with some dark brown scales; mesonotum dark brown intermixed with brown, posterior scales tuft brown mixed with dark brown. Forewing (Fig. 16.3): Length 5.31 mm in male (n=1); male costal fold absent; termen slightly concave between wing apex and M_3; costal margin prominant apical wing 1/4 at strigulae 7; ground color yellowish white; costal strigulae yellowish white, strigulae 1 indistinct, strigulae 2-4 paired and separated by dark brown, strigulae 5-9 singled, basal fascia indistinct, subbasal fascia present as dark brown spot on costa and extending irregularly to inner margin, broken medially, inner margin present as large patch, dark brown intermixed with brown, strigulae 3 and 4 with grey striae extending obliquely from costa to R_1; median fascia distinct on costa present as large dark brown spots between costa and R_2 and extending as irregular dark brown line from R_2 to inner margin, strigulae 5 with distinct narrowed striae, silvery grey, extending obliquely from costa to outer margin at between R_5 and M_1 with greyish orange

narrow striae beyond silvery grey striae extending obliquely from costa to R_5, area between strigulae 7 and 8 , 8 and 9, 9 and wing apex with brown spots on costa; ocellus region with patch, cresent-shaped between R_1 and outer margin with irregular dark brown line between R_5 and inner margin, tornus with irregular dark brown patch along margin, outer margin with dark brown line broken by yellowish strigulae between R_5 and M_1, M_3 and CuA_1. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally with sex scales, single ribbon–line on anal margin near wing base.

Male genitalia (Fig. 50.4): Tegumen with arms, narrowed, without scales or setae; uncus forming large, rouded lobe, densely scaled; socii pendant from base of uncus, small lobe, with moderately dense, long setae; gnathos arising from near midlength of tegumen, narrowed band-like, slightly sclerotized; caulis widened; anellus closely surrounding near basal half of aedeagus length; aedeagus rather short, widened, slightly narrowed to apex; cornuti dense, long, with two shapes; valva short; sacculus with sparse setae basally, ventromedial area with patch of dense, long, spiniform setae; neck deeply concaved ventrally and inner surface, sparsely setose; cucullus short, pointed at apex, densely setose, with distinct short, single spine at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP390).

Remarks. Specimen was collected during the rainy season at 935 m in hill evergreen forest.

Anathamna sp. B

Fig. 50.5

Description. Wing pattern poorly defined.

Male genitalia (Fig. 50.5): Tegumen with arms, narrowed, scaleless; uncus forming large, rounded lobe, densely setose laterally; socii absent; gnathos arising

from apical 1/3 of tegumen, band-like, widened; caulis long; anellus closely surrounding basal 1/5 of aedeagus; aedeagus moderately long and widened, slightly narrowed to apex; cornuti indistinct, present as sockets; sacculus with group of dense, long spiniform setae and sparse short setae ventromedially; neck short, deeply concaved ventrally, slightly curved, sparsely setose; cucullus oblong, moderately widened, densely long setose, apex pointed ventrally, with short, single spine at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 18 Jul 2003 (2 ♂, genitalia slide NP631, NP658).

Remarks. Specimens were collected during the rainy season at 195 m in mixed deciduous forest.

Ancylis Hübner, [1825] 1816

Ancylis Hübner, [1825] 1816, Verz. Bekannter Schmett.: 376. Type species: *Tortrix harpana* Hübner, [1796-1799].

Epicharis Hübner, [1825] 1816, Verz. Bekannter Schmett.: 376. Type species: *Tortrix dersana* Hübner, [1811-1813]. [preoccupied].

Anchylopera Stephens, 1829, Nom. Br. Insects: 47. Type species: *Pyralis lundana* Fabricius, 1776.

Phoxopteris Treitschke, 1829, in Ochsenheimer, Schmett. Eur. 7: 232. Type species: *Tortrix siculana* Hübner, [1796-1799].

Anticlea Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 113. Type species: *Tortrix harpana* Hübner, [1796-1799]. [preoccupied].

Philalcea Stephens, 1835, Illust. Br. Ent. (Haustellata) 4: 396. Type species: *Tortrix harpana* Hübner, [1796-1799]. [replacement name for *Anticlea*].

Phoxopteryx Sodoffsky, 1837, Bull. Soc. Imp. Nat. Moscou 1837: 93. [unjustified emandation of *Phoxopteris*].

Sideria Guenée, 1845, Annls. Soc. Ent. Fr. (2) 3: 156. Type species: *Tortrix achatana* [Denis & Schiffermüller], 1775.

Ancylopera Agassiz, 1847, Nomencl. Zool. (Index Univers.): 61. [unjustified emendation of *Anchylopera*].

Siderea Stainton, 1859, Man. Br. Butterflies Moths 2: 196. [misspelling of *Sideria*].

Palaeobia Meyrick, 1881, Proc. Linn. Soc. N. S. W. 6: 660. Type species: *Palaeobia hibbertiana* Meyrick, 1881.

Lamyrodes Meyrick, 1910, Proc. Linn. Soc. N. S. W. 35: 182. Type species: *Lamyrodes phileris* Meyrick, 1910.

Ancyloides Diakonoff, 1982, Zool. Verh. Leiden 193: 63. Type species: *Ancylis stenampyx* Diakonoff, 1982. [subgenus of *Ancylis*] [preoccupied].

Ancylophyes Diakonoff, 1988, Ent. Ber. 48: 195. Type species: *Ancylis stenampyx* Diakonoff, 1982. [replacement name for *Ancyloides*].

Diakonoffiella Kuznetsov, 1997, Ent. Obozr. 76: 195. [replacement name of *Ancyloides*]

Ancylis has been defined by the following characters; small to medium-sized with projecting and sometimes falcate apex, a sinuate termen usually partly edged with a line of black scales and an often characteristic wing pattern including well-

developed dark strigulae along entire costa, in distal half often with adjacent white strigulae on each side and giving rise to some strongly oblique metallic leaden lines. The labial palpi are long, porrect and sinuate with the second segment distally strongly widened by very long, loose scaled often concealing the long, slender terminal segment. The genitalia in both sexes are usually diagnostic. In male is characterized by the distally bifid uncus of two parallel, ventrally curved hooks, the large, pendant, densely hairy socii, a sacculus with strongly projecting and often produced ventrodistal angle and a very large basal excavation reaching nearly to its ventral margin, a long and broad caulis strongly curved, and by large number of deciduous, lanceolate cornuti. The female genitalia are characterized by a sclerotized funnel-shaped sterigma with a projecting ventral lip of lamella postvaginalis, a ductus semialis arising from neck of corpus bursae, by two large, flattened, triangular, blade-shaped signa, hollow bases arising from triangular areas dorsally and ventrally near middle of corpus bursa (Kuznetsov, 1987). The genus includes 129 species worldwide and 18 species that have been described from Southeast Asia (Brown, 2005). Larvae of *Ancylis* are mostly leaf rollers on a large number of host families. Kuznetsov (1987) listed Ericaceae, Salicaceae, Fagaceae, Betulaceae, Rhamnaceae and Rosaceae, with the young larva sometimes mining a leaf before producing a shelter, few damage soft fruit such as strawberries.

Ancylis anthophanes Meyrick, 1928

Figs. 16.4, 51.1

Ancylis anthophanes Meyrick, 1928, Exotic Microlepid. 3: 438. Type locality: New Britain/ New Ireland/ New Hanover. Syntype (♂, ♀): Unknown.

Description. *Head*: Lower frons orange white, upper frons brownish orange; labial palpus with first segment orange white, light orange ventrally, second segment orange white mixed with orange grey ventroapically, with brownish grey spots medially and apically, apical segment brownish orange; vertex brownish orange to light brown, with row of orange white scales posterior to eye.

Thorax: Pronotal collar brownish orange to light brown; tegulae greyish orange with light yellow basally; mesonotum light brown mixed with brown. Forewing (Fig. 16.4): Length 7.17 mm in male (n=8); male costal fold absent, wing apex round, termen concaved between M_1 and CuA_1; ground color indistinct, costal strigulae white, strigulae 1-4 indistinct, strigulae 5-8 distinct, paired and separated by dark brown, striguale 9 singled, forewing pattern separated by three longitudinal strips, costal margin with triangular patch, long between wing base and apex, widened medially between costal margin and chorda, long and narrowed white strip extending from midwing to near apex, with three slightly oblique narrowed strips, dark brown apical half, medially with longitudinal strip, greyish orange becoming darker apically, with narrowed 5 short strips near outer margin between R_4 and CuA_1, with white narrowed strip along outer margin between M_2 and CuA_1 and from wing base to near Cu, ventrally with longitudinal strip, brown near wing base, becoming paler to tornus; fasciae indistinct; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside brown with orange white near apex. Hindwing brown dorsally, ventral light brown.

Male genitalia (Fig. 51.1): Tegumen with arms high, narrowed, basal with large lobe, narrowed medially, rounded at apex; with dense scales along outer margin except 1/3 ventrally, dorsal margin concave medially; uncus absent; socii arising from tegumen apicolaterally, very short, small round lobe, dense long and short setae; gnathos arising from tegumen near apex, sclerotized band-like, curved upward medially; caulis long, widened medially, basal half with two slightly sclerotized ridge; anellus closely surrounding half of aedeagus as narrow band; aedeagus moderately long, enlarged apically, apex rounded; cornuti absent; juxta triangular, with two sclerotized process, moderately long, fused with valva by membrane; valva distinct, large, neck indistinct; sacculus large and long, margin paralleled horizontally, with large patch of very dense, long setae basally towards ventromedially; median with dense, short setae between ventromedially to dorsally; cucullus short and wide, shortly curved, raised upwardly, apex truncated, dense spines and spiniform setae, with group of moderately dense, long spiniform setae dorsobasally, apicolateral corner with pointed triangular lobe, with single, short, pointed spine at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 9 Mar 2002 (1♂, genitalia slide NP281), 14°40'03"N 98°36'07"E, 21 Nov 2003 (7♂, genitalia slide NP677, NP750).

Distribution. Thailand and New Britain.

Remarks. Specimens were collected during the winter season and the summer season at 180-1,020 m in mixed deciduous forest and hill evergreen forest.

Ancylis aromatias Meyrick, 1912
Figs. 16.5, 86.2

Ancylis aromatias Meyrick, 1912, Exotic Microlepid. 1: 31. Type locality: India (Madras, North Coorg). Lectotype (♂): BMNH.

Ancylis cyanostoma Meyrick, 1916, Exotic Microlepid. 2: 16. Type locality: India (Bengal, Pusa). Lectotype (♀): BMNH.

Description. *Head*: Lower frons orange white, upper frons brownish orange; labial palpus with first segment light brown mixed with orange white dorsally, second segment orange white to greyish orange with light brown to brown basal 1/3 with dark brown strip extending obliquely dorsomedially to ventroapically, apical segment dark brown with greyish orange apices; vertex brownish orange mixed with orange white.

Thorax: Pronotal collar, tegulae and mesonotum brownish orange. Forewing (Fig. 16.5): Length 6.68 mm in female (n=1); termen strongly concave between wing apex and M_3, ground color brownish orange, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown, fascia indistinct; inner margin with large patch extending from wing base to midwing, and from inner margin to Cu vein, light brown intermixed with brown, apical wing half with indistinct patch, dark brown extending between R vein and CuA_2, with irregular longitudinal waving line, orange white; tornus with brown patch, strigulae 5-8 united with distinct dark brown narrow striae

extending obliquely to R_4; ocellus region with transverse silvery grey striae extending obliquely from R_5 inwardly to CuA_1, wing apex brownish orange; outer margin with distinct dark brown line with white strigulae between R_5 and M_1. Underside light brown to brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Female genitalia (Fig. 86.2): Sternum VII with large sclerotized plate, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin, with sparsely setose near anterior margin; tergum VIII with sparsely setose on posterior margin towards triangular lateral extensions; papillae anales, narrowed, densely setose, lateral setae with papillose bases; lamella postvaginalis reduced; lamella antevaginalis well-developed forming large, erected vertical lobe, sclerotized, concaved posteromedially, dense microtrichia throughout; ostium bursae opening behind lobe; antrum large, long half of ductus bursae length, sclerotized; ductus seminalis arising from junction between ductus bursae and corpus bursae; corpus bursae with large, rounded sac-like on margin posteriorly, with two signa, blade-like, pointed at apex, widened at base.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♀, genitalia slide NP643).

Distribution. Thailand and India.

Remarks. Specimen was collected during the winter season at 1,040 m in hill evergreen forest.

Ancylis celerata (Meyrick), 1912

Figs. 16.6, 51.2

Eucosma celerata Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 863. Type locality: India (North Coorg, Dibidi). Lectotype (♂): BMNH.

Description. *Head*: Lower frons orange white mixed with light brown, upper frons brownish grey to light brown; labial palpus with first segment dark brown, second segment brown to dark brown with white apically, apical segment orange white; vertex brown to dark brown mixed with brownish grey.

Thorax: Pronotal collar dark brown; tegulae dark brown basal 1/3 with white to orange white apical 2/3; mesonotum white to yellowish white mixed with greyish brown posterior half. Forewing (Fig. 16.6): Length 4.13 mm in male (n=1); male costal fold absent, termen concave between wing apex and CuA_1; ground color white to yellowish white, costal strigulae white, strigulae 1-6 indistinct, strigulae 7-9 paired and separated by dark brown; inner margin with dark brown patch basal half extending from wing base to midwing and from inner margin to midwing between R vein and Cu vein; costal margin with subtriangular spot, dark brown near midwing extending from costa pointed at R vein, midwing with diffuse dark brown spots; ocellus region with irregular patch extending from R_5 to tornus with dark brown dashes between R_5 and M_1; wing apex dark brown, outer margin with white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, inner margin sclerotized, folded upwardly forming narrow groove with hair pencils inside, ventral light brown.

Male genitalia (Fig. 51.2): Tegumen narrowed without scales or setae; uncus moderately long, bifided, pointed at apex, slightly hooked, densely setose basally; socii large, rounded lobe, pendant from base of uncus to near half of tegumen length, moderately long, dense setae; gnathos arising from midlength of tegumen, slightly sclerotized; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, tubular-like, curved medially, with dense cornuti, long 3/4 of aedeagus apically; valva deeply concave ventrally forming neck; sacculus short with pointed lobe ventromedially, moderately dense setae basally towards medially; neck with sparsely setose ventrally; cucullus moderately long, enlarged basally, tapered to apex, rounded at apex, densely long setose, with short spines ventrally, outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♂, genitalia slide NP660).

Distribution. Thailand (new record) and India.

Remarks. Specimen was collected during the winter season at 742 m in hill evergreen forest.

Ancylis lutescens Meyrick, 1912
Fig. 51.3

Ancylis lutescens Meyrick, 1912, Exotic Microlepid. 1: 32. Type locality: India (Bengal, Pusa). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 51.3): Tegumen with arms, narrowed, ventral half with large subtriangular lobe, without scales or setae; uncus large round lobe, dense short, tiny spines at apex, with densely setose on inner surface, projecting outside ventrally; socii absent; gnathos indistinct; caulis long; anellus closely surrounding basal 1/6 of aedeagus length; aedeagus long, moderately large, with group of dense, short cornuti medially; juxta triangular; sacculus densely long setose from basally to subtriangular lobe on ventrobasal margin, projecting ventrally, dorsal with moderately dense, short setae towards cucullus; valva deeply concave ventrally forming short and widened neck; cucullus large, widened medially, rounded at apex, projecting ventrally, densely setose, with group of spines restricted apically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (1♂, genitalia slide NP342).

Distribution. Thailand (new record) and India.

Remarks. Specimen was collected during the summer season at 195 m in mixed deciduous forest.

Loboschiza Diakonoff, 1968

Loboschiza Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 93. Type species: *Argyroploce clytocarpa* Meyrick, 1920.

Rhadinoscolops Obraztsov, 1968, J. New York Ent. Soc. 76: 187. Type species: *Pyralis koenigiana* Fabricius, 1775

Loboschiza has been defined by the following characters; conspicuous pattern and color, species of *Loboschiza* usually has fairly long, sinuate labial palpi. The male antenna has short to moderately long cilia. The forewing pattern is usually bipartile with the basal half to 2/3 either bright yellow, orange or with bright red bands on brownish ground, and the darker distal portion, separated by a transverse leaden band, brownish or blackish, often with bright orange sinuous scribbles. In the male genitalia the valva has bipartile cucullus with a ventral process usually ending in a thorn, and/or a large tuft of long bristles from the ventral margin beyond the sacculus, the socii are two sublateral, bristled lobes with free apex, and the aedeagus has a large bundle of cornuti. The female are quite variable, with a colliculum and usually with a variably developed sclerotized area in the ductus bursae associated with the ductus seminalis, and with either one or two signa, usually concave scobinate areas (Diakonoff, 1967; Obraztsov, 1968). The genus includes 3 species worldwide and have been described from the oriental region. Fletcher (1932) noted that *Melia azadirachta* (Meliaceae) is host plant of *L. koenigiana* and larva of *L. koenigiana* also feeding in spun leaves of *M. azedarach*.

Loboschiza koenigiana (Fabricius), 1775
Figs. 16.7, 51.4, 86.3

Pyralis koenigiana Fabricius, 1775, Systema. Entomologiae: 653. Type locality: India. Syntype (s): Unknown.

Pyralis koenigana Fabricius, 1787, Mantissa Insectorum 2: 237. [misspelling of *koenigiana*].

Hemerosia aurantiana Pryer, 1877, Cist. Ent. 2: 235. Type locality: China (Chekiang, Shanghai). Holotype (♀): BMNH.

Eucelis vulnerata Walsingham, 1900, in Swinhoe, Cat. East. and Aust. Lepid. Heterocera. 2: 571. Type locality: Burma [Myanmar] (Tenasserim). Holotype: OUM.

Grapholitha delectana Snellen, 1902, Tijdschr. Ent. 44(1901): 72. Type locality: Indonesia (Java, Tegal). Syntype (3): RMNH.

Description. *Head*: Lower frons orange white, upper frons orange; labial palpus with first segment orange white, second segment light orange mixed with orange with dark brown spot dorsomedially, apical segment light orange; vertex light orange mixed with orange.

Thorax: Pronotal collar orange; tegulae orange to dark orange mixed with greyish orange; mesonotum orange to deep orange. Forewing (Fig. 16.7): Length 5.02 mm in male (n=14), 5.81 mm in female (n=1); male costal fold absent; termen rather straight; ground color greyish orange to brownish orange; costal strigulae yellowish white, strigulae 1-5 difficult to defined, strigulae 6-9 paired and separated by dark brown; basal wing 2/3 with irregular and difference shape of patch extending from costa to inner margin and from wing base to apical wing 1/3, deep orange, distal margin with light orange line, apical wing 1/3 with distinct patch, dark brown

containing with irregular strips between costa and inner margin, deep orange, all fasciae difficult to defined; outer margin with terminal strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2, deep orange. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin near wing base with group of hair pencils, brownish orange, light brown ventrally.

Male genitalia (Fig. 51.4): Tegumen with arms broad, slightly dilated near middle of tegumen, concaved apicomedially, densely setose apicolaterally; uncus and socii indistinct; gnathos arising from apical 1/3 of tegumen, broad, weakly sclerotized, protruding dorsally; caulis long; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately thick and long, slightly curved; cornuti present as dense sockets; valva elongate, basal opening narrow reaching to base of cucullus; sacculus with moderately dense setae basally, ventromedially with large group of dense, moderately long setae, dorsal sparsely setose; cucullus rather narrow, rounded at top and ventral angle produced as long, tapering, apex with a short, acute spine, dense spiniform setae.

Female genitalia (Fig. 86.3): Sternum VII with large sclerotized plate, lateral and posterior margin folded beneath sternum VII, densely scaled, posteromedially with small, sclerotized ridge; tergum VIII without scales or setae, triangular lateral extensions with moderately dense scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming large patch, dense microtrichia; ostium bursae covered by sternum VII, antrum forming cup-like, membranous; ductus bursae with short, sclerotized plate anteriorly and long sclerotized plate medially, posterior end with narrowed band reaching and curved posteriorly; ductus seminalis arising from posterior end of sclerotized plate; corpus bursae with small, sclerotized plate.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 14 Jul 2003 (1♂), 14°40'03"N 98°36'07"E, 23 Oct 2003 (10♂, genitalia slide NP754), 18 Jan 2004 (1♀, genitalia slide NP628), 14°41'43"N 98°27'34"E, 28 Oct 2003 (2♂), 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♂).

Distribution. Thailand (new record), India, China, Myanmar, Japan and Europe.

Remarks. Specimens were collected during the rainy season and the winter season at 180-1,020 m in mixed deciduous forest and hill evergreen forest.

Unplaced *Loboschiza*

Loboschiza sp. A

Figs. 16.8, 51.5

Description. *Head*: Lower frons orange white, upper frons light orange to orange, labial palpus with first segment pale orange, second segment light orange mixed with orange, apical segment orange; vertex light orange mixed with orange.

Thorax: Pronotal collar orange; tegulae brownish orange mixed with orange outer marginal half; mesonotum light orange mixed with orange. Forewing (Fig. 16.8): Length 3.81 mm in male (n=1); male costal fold absent, termen round, ground color greyish orange to brownish orange; costal strigulae yellowish white, strigulae1-5 difficult to defined, strigulae 6 paired and separated by dark brown, strigulae 7-9 singled, basal wing 2/3 with irregular and difference shape of patch extending from costa to inner margin and from wing base to apical wing 1/3, deep orange, distal margin with light orange line, apical wing 1/3 with distinct patch, dark brown containing with irregular strips between costa and inner margin, deep orange, all fasciae difficult to defined; outer margin with terminal strigulae between R_5 and M_1, M_1 and M_2, CuA_1 and CuA_2, deep orange. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin near wing base with group of hair pencils, brownish orange, light brown ventrally.

Male genitalia (Fig. 51.5): Tegumen with arms, broaded, moderately dense scales lateromedially and apicolaterally; uncus absent; socii developed, large patch, long, apical half of tegumen, dense spiniform setae; gnathos indistinct; anellus closely

surrounding at base of aedeagus; aedeagus moderately long, narrowed to apex; cornuti dense, deciduous, located near middle of aedeagus; valva long, widened medially, apex rounded, with distinct short, single spines on outer margin medially; sacculus with moderately dense, long setae ventrobasally; neck indistinct; cucullus long, densely setose throughout.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Aug 2002 (1♂, genitalia slide NP443).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Tetramoera Diakonoff, 1968

Tetramoera Diakonoff, 1968, Bull. U.S. Nat. Mus. 257(1967): 68. Type species: *Grapholitha schistaceana* Snellen, 1890.

Tetramoera has been defined by the following characters; brownish moths with elongate-subrectangular forewings with a blunt apex, a strongly sinuate termen and an intricate wing pattern of mostly longitudinal, fine, parallel, cream, grey and brown lines interrupted beyond middle of wing by a transverse series of irregular dark marks conspicuous costal strigulae and a prominent leaden line running from beyond middle of costa to below apex then curved along termen to tornus. The labial palpi are long, porrect and sinuate. The male genitalia are highly characteristic with a uniquely modified, deeply bilobed, flat and densely hairly valva with the dorsal lobe without a thorn but with a flap-shaped process from its ventral margin. The female genitalia are characterized by a single signum varying from a long crease with a small blade along central ridge to a flat, sclerotized ribbon or an ovate concave plate with a small thorn on central ridge (Diakonoff, 1967, 1982). The genus includes 6 species worldwide and is most diverse in the Oriental region. *Tetramoera* includes 3 species that have been described from Southeast Asia (Brown, 2005).

Tetramoera flavescens Kuznetsov, 1988

Figs. 17.1, 52.1

Tetramoera flavescens Kuznetsov, 1988, Ent. Obozr. 69: 619. Type locality: North Vietnam (Sonla Province, Chienghouan). Holotype (♂): ZMAS.

Description. *Head*: Lower frons orange white, upper frons dark brown mixed with greyish orange medially; labial palpus with first segment yellowish white, second segment yellowish white to pale yellow with brownish grey spot dorsomedially, ventroapically, with brown spot dorsoapically, apical segment greyish yellow; vertex dark brown with yellowish white apices mixed with greyish orange.

Thorax: Pronotal collar light brown; tegulae brown to dark brown mixed with greyish orange: mesonotum brown to dark brown mixed with greyish orange. Forewing (Fig. 17.1): Length 5.45 mm in male (n=1); male costal fold absent, termen slightly concaved between wing apex and M_3; ground color greyish yellow to greyish orange; costal strigulae yellowish white, strigulae 1-6 paired and separated by dark brown, strigulae 7-9 singled, basal patch present as irregular strips extending form costa to inner margin, dark brown, strigulae 3 and 4 with grey stirae extending from costa to R vein; median fascia distinct extending from costa to inner margin, dark brown, distal margin extending obliquely from costa to R_5, angled extending curve to inner margin, strigulae 5 with grey striae extending obliquely from costa to outer margin at between R_5 and M_1; postmedian fascia present as dark brown spot extending obliquely from costa to R_5; dark brown; preterminal fascia extending obliquely from costa to R_5 near outer margin, dark brown; ocellus region with strip, cresent-shaped extending obliquely from base of R_5 to outer margin between M_2 and M_3, with longitudinal irregular strip between vein, M_1 and CuA_2, dark brown; outer margin with dark brown line extending from wing apex to between R_5 and M_1. Underside light brown with yellowish white spots on costa between veins and yellowish white line along outer margin between M_2 and tornus. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 52.1): Tegumen subtriangular with arms, moderately broad, with group of moderately dense scales basally, apical extending dorsally, with dense long setae, especially near apex, apex constricted apicomedially; uncus and socii indistinct; gnathos indistinct; caulis short; anellus surrounding basal of aedeagus; aedeagus large, moderately long, slightly curved medially, with patch of dense microtrichia ventromedially, vesica denticulate apically; cornuti absent; valva with dorsal margin of sacculus towards cucullus, rotated downwardly; sacculus moderately long, with dense, long spines and sparse setae between basal opening and neck; neck deeply concaved ventrally, short; cucullus short, densely setose, with small,single knob dorsoapically, ventroapically with distinct short, single spine, and moderately large lobe, flattened margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Aug 2002 (1♂, genitalia slide NP379).

Distribution. Thailand (new record) and Vietnam.

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Unplaced Enarmoniini

Genus A sp. A

Figs. 17.2, 52.2, 86.4

Description. *Head*: Lower frons greyish orange mixed with brown, upper frons light brown to brown; labial palpus with first segment yellowish white, second segment orange white to greyish orange with brown patch dorsomedially, apical segment brown; vertex brownish orange mixed with light brown.

Thorax: Pronotal collar dark brown mixed with brownish orange; tegulae light brown to brown; mesonotum brownish orange to light brown. Forewing (Fig. 17.2):

Length 5.4 mm in male (n=1), 6.31 mm in female (n=1); male costal fold absent, termen slightly concave between wing apex and M_3; ground color yellowish white, strigulae indistinct, strigulae 2-9 singled; basal patch distinct from wing base to strigulae 3 and from costa to inner margin separated by longitudinal brownish orange line, distal margin extending obliquely, angled at R_5, distal margin with light brown line connected; median fascia present as small triangular spot on costa with brownish orange, narrow line bordered; postmedian and preterminal fascia present as dark brown spots on costa, strigulae 2 and 3 with fused greyish orange striae extending from costa to R vein with light brown striae extending parallel at distal margin, strigulae 5-8 with short, brownish orange striae, fused and extending obliquely to outer margin at R_5, strigulae 9 with short, brownish orange striae extending to outer margin, strigulae 5 with light brown striae extending obliquely to near outer margin, dorsum patch forming large, triangular patch, dark brown extending from inner margin to mid of discal cell, ventroapical half of wing with irregularly curved lines, brown; ocellus region with patch extending obliquely from M_2 to tornus, dark brown mixed with silvery grey scales, metallic green when viewed at angled to light, with 3 greyish orange dashes; outer margin with yellowish white strigulae between M_1 and M_2. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 52.2): Tegumen with arms, narrowed, rounded, dense scales apicolaterally; uncus reduced present as rounded lobe, densely setose laterally; socii moderately long, sparsely setose, becoming more dense towards apex; gnathos arising from basal 1/3 of tegumen, weakly sclerotized, band-like, disconnected medially; anellus closely surrounding basal 1/3 of aedeagus; aedaegus large and long, narrowed to apex; cornuti absent; valva with distinct shaped, slender, curved, narrowed to apex; sacculus with sparsely setose on basal opening medially, ventroapically with patch of long, dense setae; neck indistinct; cucullus short, subtriangular, rotated basally, densely setose, pointed at apex, with two sized of pointed spines at apex.

Female genitalia (Fig. 86.4): Sternum VII with small, weakly sclerotized plate, dense scales, sparsely setose, posterior margin slightly sinuated; tergum VIII and triangular lateral extensions without scales or setae; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae covered by sternum VII, anterior margin fused with sternum VII, dense microtrichia, antrum forming sclerotized, suboval-shaped, colliculum indistinct; ductus bursae long, slightly enlarged to posteriorly; ductus seminalis arising from anterior 1/4 of ductus bursae; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (1♀, genitalia slide NP372), 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂, genitalia slide NP685).

Remarks. Specimens were collected during the summer season and the rainy season at 180-255 m in mixed deciduous forest and dry evergreen forest.

Genus B sp. A

Figs. 17.3, 52.3

Description. *Head*: Lower frons and upper frons brown mixed with dark brown; labial palpus with first, second and apical segment brown; vertex dark brown with yellowish white apices.

Thorax: Tegulae brown to dark brown with basal 4/5 greyish orange apices, apical 1/5 with white apices; mesonotum brown to dark brown with anterior 2/3 greyish orange, apical 1/3 with white apices. Forewing (Fig. 17.3): Length 6.13 mm in male (n=1); male costal fold absent; termen rather straight; ground color intermixed with white; costal strigulae yellowish white, strigulae 1-2 indistinct, strigulae 3-6 paired and separated by dark brown, strigulae 7-9 present as indistinct single strigulae; basal patch distinct on costa extending from wing base to strigulae 3 and from costa to inner margin, distal margin indistinct near inner margin; median fascia distinct

extending obliquely from costa inwardly to inner margin, dark brown surrounding with brown scales; postmedian fascia with row of dark brown dash extending oblique from costa to outer margin at M_2, dark brown dashes present between line extending obliquely from costa to outer margin at between R_5 and M_1 with two dark brown dots between R_3 and R_4 , R_4 and R_5; ocellus region with dark brown patch between M_1 and M_2 and dark brown irregular transverse from M_2 to inner margin near tornus surrounding with brown scales. Underside brown with indistinct yellowish white spots on costa medially. Hindwing brown to dark brown with greyish orange patch medially, ventral light brown with greyish orange patch medially.

Male genitalia (Fig. 52.3): Tegumen with arms, rather narrowed, without scales or setae; uncus subquadrate, slightly concaved apicomedially and basolaterally, with dense moderately long setae, sparsely long setose, except transverse medial line; socii absent; gnathos arising from midlength of tegumen, band-like, moderately widened, sclerotized basally; anellus surrounding basal of aedeagus; aedeagus rather short, slightly narrowed to apex; cornuti absent; juxta triangular; sacculus with patch of dense setae between basal opening and ventral margin, median with small lobe near basal opening, moderately dense, short setae; neck indistinct; cucullus moderately broad, rounded at apex, densely setose, with dense, moderately long spines along near ventral margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'01"N 98°27'28"E, 19 Jun 2002 (1♂, genitalia slide NP417).

Remarks. Specimen was collected during the summer season at 780 m in mixed deciduous forest.

Genus C sp. A

Figs. 17.4, 86.5

Description. *Head*: Lower frons yellowish white, upper frons dark brown; labial palpus with first segment orange white, second segment pale orange to light orange, apical segment light orange; vertex dark brown mixed with light brown.

Thorax: Pronotal collar brown to dark brown; tegulae brown; mesonotum brown. Forewing (Fig. 17.4): Length 7.61 mm in female (n=1); termen slightly concave between wing apex and M_2; ground color brown; costal strigulae light yellow, strigulae 1-4 indistinct, strigulae 5-9 paired and separated by dark brown; basal and subbasal fascia indistinct suffused with ground color; median fascia distinct on costa extending oblique irregulary from costa to R vein surrounding with irregular patch, brownish orange between R vein and M stem, strigulae 5 with silvery grey striae extending obliquely from costa to R_4, strigulae 6 with short striae on costa; postmedian fascia extending oblique irregularly from costa to outer margin at M_3, dark brown; stigulae 7 with silverly grey striae extending obliquely from costa to outer margin at M_1; preterminal fascia extending obliquely from costa to outer margin at between R_5 and M_1; outer margin with irregular dark brown line extending from R_4 to tornus surrounding with brownish orange scales, with transverse curved, short line between M_1 and M_3, dark brown, with three dark brown spots between M_1 and CuA_1 wing apex brownish orange. Underside light brown to brown with yellowish white spots on costa. Hindwing dorsally with brown to dark brown with light yellow patch basally, ventral light brown to brown with pale yellow basally.

Female genitalia (Fig. 86.5): Sternum VII with moderately large, sclerotized plate, subtriangular, posterior margin deeply concaved medially, densely scaled laterally, each side with loop, curved, medially; tergum VIII densely scaled posteriorly, triangular lateral extensions with moderately dense scales; papillae anales erected, narrowed posteriorly, laterally widened, densely setose; lamella antevaginalis reduced, lamella postvaginalis fused with sternum, forming sclerotized narrowed ring with sclerotized narrowed band medially, extending straight posteriorly; ostium bursae

covered by sternum VII, antrum sclerotized; ductus bursae narrowed; ductus seminalis indistinct; corpus bursae with two large signa, subtriangular.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♀, genitalia slide NP96).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Genus D sp. A

Figs. 17.5, 52.4

Description. *Head*: Lower frons orange grey, upper frons brown; labial palpus with first segment brown, second segment brown to dark brown, apical segment brown to dark brown; vertex greyish orange.

Thorax: Pronotal collar brownish orange; tegulae brownish orange mixed with brown, with dark brown basally; mesonotum light brown mixed with brown.
Forewing (Fig. 17.5): Length 4.27 mm in male (n=2); male costal fold absent, termen concave between wing apex and CuA_1; ground color pale orange to greyish orange; costal strigulae yellowish white, strigulae 1-4 and 8 absent, strigulae 5-7 and 9 paired and separated by dark brown; basal patch present as irregular transverse line extending from costa to inner margin, brown mixed with dark brown; distal margin extending obliquely from costa to midwing, angled and extending obliquely to inner margin; median fascia distinct on costa extending obliquely from costa irregular to mid wing, strigulae 5 and 6 with narrow silvery grey striae extending obliquely from costa to R_5, interfascia between strigulae 5 and 6 with brownish orange striae extending from costa to R_5; postmedian fascia present as dark brown spot on costa, strigulae 7 with narrow silvery grey striae extending obliquely from costa to outer margin at R_5, area between strigulae 7 and 9 with dark brown patch on costa; ocellus region with silvery grey spots between M_1 and tornus, with short transverse dark brown strip near outer margin between M_1 and M_3; outer margin with yellowish white terminal strigulae between R_5

and M_1 , M_2 and M_3, M_3 and CuA_1. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 52.4): Tegumen subtriangular with arms, narrowed, widened apically, densely scaled; uncus reduced as rounded lobe; socii present as small patch of moderately dense scales apicolaterally; gnathos arising from apical 1/3 of tegumen, widened, band-like, slightly sclerotized; caulis short; anellus closely surrounding basal 1/4 of aedeagus; aedeagus rather short, straight, slightly narrowed to apex; cornuti absent; juxta triangular; valva rotated apically, inner surface concaved medially, ventromedially concaved forming neck, short; sacculus with small group of short setae basally, ventromedial margin with group of setae, median with dense, long spines, becoming short towards neck, dorsal with dense setae reaching to neck; costal hook with dense, long setae; cucullus short, rounded at apex, dense spiniform setae, with dense spines apically, basomedially with distinct long, single spine.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 2 Oct 2002 (1♂, genitalia slide NP447), 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂, genitalia slide NP686).

Remarks. Specimens were collected during the rainy season at 740-956 m in hill evergreen forest.

Genus E sp. A

Figs. 17.6, 53.1, 53.2

Description. *Head*: Lower frons light brown, upper frons dark brown; labial palpus with first segment brown, second segment light brown with yellowish white apical 1/3, apical segment white; vertex brown mixed with light brown.

Thorax: Pronotal collar dark brown; tegulae brown mixed with dark brown; mesonotum brown mixed with dark brown. Forewing (Fig. 17.6): Length 4.4 mm in

male (n=1); male costal fold absent, termen deeply concaved between wing apex and CuA_1; ground color and costal strigulae white, strigulae 1-3 difficult to defined, strigulae 4-9 singled, basal fascia distinct on wing base 1/5, extending from costa to inner margin, dark brown; subbasal fascia distinct present as transverse line extending from costa to inner margin, dark brown, area between strigulae 4 and strigulae 8 with large patch extending from costa to inner margin, brown mixed with dark brown intermixed with diffuse silvery grey spots, distal margin distinct, dark brown; strigulae 9 with silvery orange grey spot on costa; ocellus region with two large, silvery orange grey spots between M_2 and CuA_2, wing apex brownish orange intermixed with dark brown; outer margin with distinct dark brown line between wing apex and CuA_1. Underside light brown without any spots on costa. Hindwing with narrow dark brown scales dorsal 4/5, light brown apical 1/5, ventral light brown.

Abdomen (Fig. 53.2): Sternum VIII laterally with scale pocket protuding posteriorly, contaning long, dense hair-like scales.

Male genitalia (Fig. 53.1): Tegumen subtriangular, pointed at apex, with arms, moderately broaded, scaleless; uncus absent; socii large, apical half of tegumen length, subtriangular, densely setose; gnathos indistinct; anellus surrounding base of aedeagus; aedeagus rather short, widened, with moderately large at base, composing of cornuti sockets; cornuti dense, deciduous; sacculus with moderately large, subtriangular lobe ventromedially, pointed ventrally, ventral margin with moderately dense setae reaching to subtriangular lobe; neck long, slightly curved, sparsely setose; cucullus enlarged, semicircular, rounded dorsally, densely setose, with distinct short, single spine ventroapically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 28 Jul 2002 (1♂, genitalia slide NP541).

Remarks. Specimen was collected during the rainy season at 947 m in hill evergreen forest.

Genus F sp. A

Figs. 17.7, 53.3

Description. *Head*: Lower frons yellowish white, upper frons dark brown; labial palpus with first segment dark brown, second segment dark brown with yellowish at apex, apical segment yellowish white; vertex light brown mixed with dark brown.

Thorax: Pronotal collar brown to dark brown; tegulae dark brown with light brown medially; mesonotum dark brown with light brown transverse strip medially. Forewing (Fig. 17.7): Length 4.36 mm in male (n=1); male costal fold absent, termen concaved between wing apex and M_2, wing apex prominent; ground color orange white; costal strigulae yellowish white, strigulae 1-2 singled, strigulae 3-9 paired and separated by dark brown; basal patch distinct, dark brown extending from wing base to strigulae 3 and from costa to inner margin; median fascia forming moderately large patch, brown mixed with dark brown on costa between strigulae 4 to strigulae 6 and from costa to midwing; postmedian fascia forming dark brown spot on costa and extending obliquely as brownish orange to outer margin; preterminal fascia present as subtriangular dark brown spot; wing apex dark brown, ventrobasal 2/3 of wing length with diffuse dark brown transverse line; outer margin with orange white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Male genitalia (Fig. 53.3): Tegumen with arms, moderately broad, basolateral half densely scaled; uncus reduced forming small, subtriangular lobe, with sparse long setae; socii rather small, arising from tegumen apicolaterally, subtriangular, apically rounded, densely long setose; gnathos arising from midlength of tegumen, band-like, completed; anellus surrounding basal half of aedeagus, cup-shaped; aedeagus short, moderately widened, slightly narrowed to apex; cornuti dense; membrane between tegumen and valva with small lobe of sparse, short setae; sacculus with basal opening widened, oblong towards near cucullus basally, basally and ventral margin with moderately dense, long setae, dorsal sparsely setose; neck indistinct; cucullus small,

short, oval-shaped, dense spiniform setae, ventral margin with two distinct, long spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP403).

Remarks. Specimen was collected during the summer season at 935 m in hill evergreen forest.

Genus G sp. A

Figs. 17.8, 53.4, 86.6

Description. *Head*: Lower frons light brown to brown, upper frons brown; labial palpus with first segment brown to dark brown, second segment brown to dark brown, apical segment dark brown; vertex light brown to brown.

Thorax: Pronotal collar brown mixed with dark brown; tegulae dark brown; mesonotum brown mixed with dark brown. Forewing (Fig. 17.8): Length 3.23 mm in male (n=1), 3.45 mm in female (n=1); male costal fold absent, termen slightly concaved between R_5 and M_2; ground color brown to dark brown; costal strigulae indistinct; fasciae indistinct, with large patch basal 5/6 of wing length, area between distal margin of patch and outer margin with pale orange to greyish orange scales, with longitudinal dark brown scales along the veins between R_5 and CuA_1; outer margin with distinct dark brown line, terminal strigulae absent. Underside light brown. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 53.4): Tegumen with arms, rather narrowed, scaleless; uncus reduced; socii forming large lobe, constricted at apex, fused dorsally, extending to near half of tegumen, densely setose; gnathos indistinct; caulis long, slender; anellus closely surrounding basal 1/5 of aedeagus; aedeagus rather short, narrowed to apex, angled medially; cornuti dense, located at middle of aedeagus; sacculus with ventromedial area forming subtriangular lobe, densely setose, dorsal sparsely setose;

neck long, concaved ventrally, slightly curved, porrected, sparsely setose; cucullus moderately large, suboval-shaped, dense spiniform setae, with distinct single, rather short spine ventroapically.

Female genitalia (Fig. 86.6): Sternum VII with moderately large, sclerotized plate, densely scaled, posterior margin concaved medially, sclerotized; tergum VIII and triangular lateral extensions sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae rather small, with anterior and posterior margin forming sclerotized, narrowed ring; ductus bursae with anterior 1/5 granulated on inner surface; ductus seminalis arising from near posterior end of ductus bursae; corpus bursae with anterior margin forming small, rounded lobe, projecting dorsally, with two large, unequal signa, curved, blade-like, pointed at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂, genitalia slide NP600), 14°39'02"N 98°31'40"E, 20 Nov 2003 (1♀, genitalia slide NP601), 22 Dec 2003 (1♂).

Remarks. Specimens were collected during the rainy season and the winter season at 195-742 m in mixed deciduous forest and hill evergreen forest.

Genus H sp. A

Figs. 18.1, 53.5, 87.1

Description. *Head*: Lower frons and upper frons poorly defined; labial palpus with first segment light brown, second segment orange brown, becoming paler to orange white apically, apical segment orange white; vertex light brown mixed with brown.

Thorax: Pronotal collar dark brown; tegulae orange white with dark brown basal 1/3; mesonotum orange white with transverse dark brown strip anterior 1/5. Forewing (Fig. 18.1): Length 3.31 mm in male (n=1), 3.77 mm in female (n=1); male

costal fold absent, termen deeply incised between wing apex and M_3; ground color orange white; costal strigulae 1-7 indistinct, strigulae 8-9 singled forming large white spots; fasciae confluence forming large patch, brown mixed with dark brown extending form wing base to strigulae 8 and from costa to inner margin; wing apex brownish orange; outer margin with distinct dark brown line, terminal strigulae absent. Underside light brown. Hindwing light brown with slender dark brown scales basal half on discal cell and anal margin

Male genitalia (Fig. 53.5): Tegumen with arms, narrowed, scaleless, apically rounded; uncus absent; socii large, arising from tegumen apicolaterally, subtriangular, prolong apically, rounded at apex, densely setose; gnathos arising from midlength of tegumen, membranous; anellus closely surrounding basal 1/4 of aedeagus, extended dorsally; aedeagus moderately long, widened, tubular, over apical 1/3 narrowed to apex; cornuti dense; sacculus sparsely setose ventrally; with small subtriangular lobe ventromedially, rounded at apex, dense short setae, dorsal sparsely setose; neck moderately long, deeply concaved, moderately widened, sparsely setose; cucullus large, widened apically, apical margin rounded, densely setose, outer margin sparsely setose, ventroapically with distinct small, single spine.

Female genitalia (Fig. 87.1): Sternum VII with moderately large, sclerotized plate, densely scaled; tergum VIII without scales or setae, triangular lateral extensions sparsely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis forming small, sclerotized plate, dense microtrichia laterally, fused with anterior margin of ostium bursae, constricted medially, lamella postvaginalis reduced; ductus bursae with antrum densely microtrichiate on inner surface, colliculum narrowed, weakly sclerotized; posterior end with small, sclerotized plate, inner surface denticulated; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae with single large, blade-like signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Nov 2003 (1♂, genitalia slide NP640), 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♀, geniatlia slide NP624).

Remarks. Specimens were collected during the winter season at 195-742 m in mixed deciduous forest and hill evergreen forest.

Genus I sp. A

Fig. 54.1

Description. Wing pattern poorly defined.

Male genitalia (Fig. 54.1): Tegumen with arms, moderately broad, scaleless; uncus absent; socii forming large, long subtriangular, densely setose, arising from tegumen apicolaterally, pendant to near midlength of tegumen; gnathos membranous, arising from over apical 1/3 of tegumen; anellus closely surrounding basal of aedeagus; aedeagus long, moderately widened, slightly narrowed to apex; cornuti dense; sacculus with ventral margin towards ventromedially, moderately dense setae, dorsal sparsely setose; neck moderately long, widened, sparsely setose; cucullus large, oblong, widened apically, apex rounded, densely long setose, ventrobasally with moderately large, triangular lobe, pointed at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 23 Oct 2003 (1♂, genitalia slide NP636).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Genus J sp. A

Figs. 18.2, 87.2

Description. *Head*: Lower frons and upper frons orange white; labial palpus with first segment orange white, second segment orange grey mixed with light brown spot dorsoapically, apical segment orange white; vertex orange white.

Thorax: Pronotal collar orange white; tegulae orange white with diffuse dark brown spots basally; mesonotum orange white. Forewing (Fig. 18.2): Length 4.45 mm in female (n=1); termen concaved between wing apex and CuA_1; ground color yellowish white; costal strigulae1-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled, subbasal fascia present as small dark brown spot on costa; median fascia present as diffuse widened line, dark brown, extending obliquely from costa between strigulae 4 and 5 to M_2 and extending curved to wing apex, separated by ground color; preterminal fascia present as small dark brown spot; wing apex dark brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside orange grey with orange white spot on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Female genitalia (Fig. 87.2): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII and triangular lateral extensions sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis fused with ostium bursae laterally, forming moderately large, sclerotized plate, extending pointed antereomedially, densely microtrichiate, sparsely scaled; ostium bursae with anterior margin sclerotized; ductus bursae moderately long, colliculum small, weakly sclerotized, with large, sclerotized plate, irregular, long 2/3 of ductus bursae posteriorly, posterior end with small, sclerotized plate, reticulated; ductus seminalis indistinct; corpus bursae with two unequal signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 23 Aug 2003 (1♀, genitalia slide NP637).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Genus K sp. A

Fig. 54.2

Description. Wing pattern poorly defined.

Male genitalia (Fig. 54.2): Tegumen with arms, broaded, moderately dense scales laterally; uncus short, forming rounded lobe, rather small, projecting curved ventrally, sparsely setose laterally, with dense setae sockets apically; socii arising from tegumen apicolaterally, horn-like, moderately long, slightly curved apically, pointed at apex, with dense, long setae; gnathos arising from near midlength of tegumen, band-like, widened; anellus closely at base of aedeagus; aedeagus widened, moderately long, slightly narrowed to apex; cornuti nine; sacculus with moderately dense setae basally, ventromedian with group of dense, moderately long, spiniform setae, median with moderately dense setae between basal opening and neck, dorsal sparsely setose; neck short, concaved ventrally, sparsely setose; cucullus long, clavate, curved medially, slightly dilated to apex, apex rounded, dense spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 23 Oct 2003 (1♂, genitalia slide NP661).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Genus L sp. A

Fig. 87.3

Description. Wing pattern poorly defined.

Female genitalia (Fig. 87.3): Sternum VII with two parts, posterior part moderately sclerotized, densely scaled and microtrichiate, separated medially, anterior margin slightly folded, sclerotized, anterior part forming transverse strongly sclerotized plate, enlarged medially, forming large, subtriangular lobe, separated

medially, dense denticulated throughout; tergum VIII moderately dense setae posteriorly, triangular lateral extensions densely scaled, sparsely setose; papillae anales densely setose, lateral setae with short, papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming long patch, densely microtrichiate, with sparsely setose posteriorly; ostium bursae covered by sternum VII, antrum forming a small, sclerotized cup; ductus bursae moderately long, with large, secondary corpus bursae arising from posterior end, ductus seminalis arising form anterior end of secondary corpus bursae; corpus bursae smaller with two small, unequal signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♀, genitalia slide NP705).

Remarks. Specimen was collected during the winter season at 963 m in hill evergreen forest.

Genus M sp. A

Fig. 54.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 54.3): Tegumen with arms, broaded, narrowed basally, densely scaled laterally, concaved apicomedially; uncus rather short, densely microtrichiate, widened basally, apically narrowed, apex truncated with dense, short setae, apicolaterally acuted; socii large, suboval shaped, inner surface densely setose, pendant from tegumen apicolaterally to near middle of tegumen; gnathos arising from midlength of tegumen, completed band-like; anellus cup-like, surrounding basal of aedeagus; aedeagus long, curved medially, slightly narrowed to apex, cornuti dense; sacculus with group of dense, moderately long setae basally, ventromedial margin moderately dense setae, median with moderately dense, long and short setae between basal opening and neck, dorsal with moderately dense setae; neck deeply concaved ventrally, rather short, sparsely setose; cucullus large, dorsal margin straight, sparsely setose, ventral margin rounded, apex rounded, with dense spines ventrally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♂, genitalia slide NP715).

Remarks. Specimen was collected during the rainy season at 742 m in hill evergreen forest.

Genus N sp. A

Fig. 87.4

Description. Wing pattern poorly defined.

Female genitalia (Fig. 87.4): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled; tergum VIII sparsely sclaed posteriorly, triangular lateral extensions with moderately dense scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis forming two rounded lobe, concaved medially, densely microtrichiate, except medially, with sparsely scaled laterally, fused with lamella postvaginalis laterally, forming moderately large, sclerotized plate, dense microtrichia; ostium bursae present as small, rounded medially, antrum with a small, sclerotized cup; ductus bursae moderately long, with sclerotized plate medially, posterior end with inception of ductus seminalis; corpus bursae with two flattened, curved, blade-like signa, apex rounded.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP721), 14°40'03"N 98°36'07"E, 21 Sep 2003 (1♀, genitalia slide NP717).

Remarks. Specimens were collected during the rainy season at 180-220 m in mixed deciduous forest.

TRIBE EUCOSMINI

Acroclita Lederer, 1859

Acroclita Lederer, 1859, Wien. Ent. Monatschr. 3: 123. Type species: *Paedisca arctana* Staudinger, 1859 (=*Tortrix* (*Semasia*) *subsequana* Herrich-Schäffer, 1851).

Acrolita Fernald, 1908, Genera Tortricidae Types: 59. [misspelling of *Acroclita*].

Acrocita Turner, 1946, Trans. R. Soc. S. Austral. 70: 197. [misspelling of *Acroclita*].

Acroclita has been defined by the following characters; narrow-winged, with forewing mottled with bluish and olive greenish on whitish background, without costal fold but with two raised scale-tufts on the dorsal half near middle, and with dark grey hindwings transparent between the scales. The genus has long, porrect labial palpi with the second segment strongly widened beyond middle and the third segment long and slender. R_4 and R_5 are stalked in the forewing and the base of R_3 is closely approximated to their stalk. The male genitalia are characterized by a stout tegument with lateral, usually bifid, strongly sclerotized socii, a slender and medially constricted valva with a triangular to tooth-like process from ventral margin of basal excavation, flattened bristles from outer surface of valva and by a wide juxta, a short caulis and a small aedeagus. The female genitalia are characterized by a spinulose swelling in the lamella postvaginalis, a short, wide ductus bursae containing folded sclerites in its entire length, and two horn-shaped signa (Kuznetsov, 1987). The genus includes 42 species worldwide. Larvae of *Acroclita subseguana* feed on leaves and seeds of *Euphorbia* spp. (Euphorbiaceae) (Bradley et. al., 1973) and two Japanese species tightly spin young leaves of *Elaeagnus umbellate* (Elaeagnaceae).

Acroclita cheradota Meyrick, 1912

Figs. 18.3, 54.4

Acroclita cheradota Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 856. Type locality: India (Pusa, Bengal). Lectotype (♂): BMNH.

Description. *Head*: Lower frons white to orange white, upper frons brownish orange; labial palpus with first segment white, second segment white to yellowish orange, apical segment indistinct.

Thorax: Pronotal collar orange white mixed with greyish orange; tegulae greyish orange with brownish orange basal 1/3; mesonotum with brownish strip, orange white medially. Forewing (Fig. 18.3): Length 4.77 mm in male (n=1), male costal fold absent, termen concave between wing apex and CuA_1; ground color orange white to greyish orange; costal strigulae orange white, stigulae 1-8 paired and separated by dark brown, strigulae 9 singled; fascia indistinct, inner margin basal half with subcircular patch extending from near wing base to midwing and from inner margin to mid of discal cell, brownish orange mixed with brown and dark brown with orange white spot medially, costal margin with small subtriangular patch medially extending from costa to R vein, light brown; ocellus region with irregular light brown patch extending from R_5 to tornus; wing apex brown; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 54.4): Tegumen narrowed, widened dorsally, with group of moderately dense scales basally; uncus absent; socii pendant from tegumen dorsolaterally, rather short, subtriangular lobe, rounded at apex, sparsely setose; gnathos distinct arising near midlength of tegumen, band-like, sclerotized, with sclerotized long plate raised up medially; anellus surrounding base of aedeagus; aedeagus long, slender, slightly tapered to apex; cornuti absent; sacculus with group of moderately long setae basally, ventromedial area with moderately large rounded lobe

prominence dorsally, densely long setose dorsally, dorsal with group of dense, long setae; neck deeply incised ventrally, without setae; cucullus moderately long, dilated apically, apex rounded, densely setose mixed with short spines ventrally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Aug 2002 (1♂, genitalia slide NP448).

Distribution. Thailand (new record) and India.

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Acroclita lithoxoa Diakonoff, 1950
Figs. 18.4, 87.5

Acroclita lithoxoa Diakonoff, 1950, Bull. Br. Mus. (Nat. Hist.), Ent. 1(4): 278. Type locality: India (Bengal, Pusa). Holotype (♂): BMNH.

Description. *Head*: Lower frons difficult to defined, upper frons orange white, labial palpus with first segment dark brown, second segment brown to dark brown with orange white apically, apical segment orange white; vertex brown to dark brown mixed with greyish orange.

Thorax: Pronotal collar dark brown; tegulae dark brown mixed with greyish orange apical half; mesonotum brown mixed with dark brown. Forewing (Fig. 18.4): Length 4.81 mm in female (n=2); termen slightly concave between R_5 and M_3; ground color white mixed with diffuse transverse light brown striae, costal strigulae white, strigulae 1-9 paired and separated by dark brown except strigulae 8 absent on costa; basal fascia incompleted extending from wing base to strigulae 1 and from costa to inner margin, dark brown; subbasal fascia distinct extending from costa enlarged to inner margin, brown mixed with dark brown; median fascia distinct extending obliquely from costa to inner margin, enlarged medially, brown to dark brown;

between strigulae 7 and strigulae 9 with dark brown spot extending from costa to R_5, wing apex dark brown; ocellus region with dark brown dashes between veins extending from R_5 to tornus; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Female genitalia (Fig. 87.5): Sternum VII slightly sclerotized, densely scaled, sparsely setose, median with more sclerotized large lobe longitudinally, widened anteriorly, slightly concaved near posteriorly, dilated posteriorly, rounded at apex, dense microtrichia posteriorly; tergum VIII with moderately dense scales posteriorly and on triangular lateral extensions; papillae anales narrowed, densely setose, lateral setae with papillose bases; lamella postvaginalis and lamella antevaginalis reduced; ostium bursae small, opening behind sternum VII lobe; antrum small cup-shaped, sclerotized, colliculum small; ductus bursae with large sclerotized plate medially, long 1/3 of ductus bursae length, with round lobe prominence medially, with ductus seminalis arising at apex; corpus bursae with two signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP528), 11 Jun 2002 (1♀, genitalia slide NP451).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during the summer season at 742 m in hill evergreen forest.

Acroclita macrosaris (Meyrick), 1938

Figs. 18.5, 55.1, 55.2

Eucosma macrosaris Meyrick, 1938, Dt. Ent. Z. Iris 52: 84. Type locality: Indonesia (Java, Djokjakarta). Holotype (♂): BMNH.

Description. *Head:* Lower frons orange white, upper frons light brown; labial palpus with first segment pale orange, second segment light brown mixed with dark brown spots, apical segment light brown; vertex light brown mixed with brown.

Thorax: Pronotal collar dark brown; tegulae and mesonotum light brown mixed with brown. Forewing (Fig. 18.5): Length 6.43 mm in male (n=1); male costal fold absent, termen straight; ground color orange white; costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal patch present irregularly extending from wing base to strigulae 3 and from costa to inner margin, brown mixed with dark brown with diffuse orange white scales, distal margin extending dislocated ventral half of patch; median fascia extending distinct, dark brown from costa to M_1 and extending irregularly to inner margin, brown mixed with dark brown, distal margin extending obliquely from costa to R_5, angled and extending inwardly to inner margin; postmedian fascia extending obliquely from costa to R_5 near outer margin, angled and extending inwardly to inner margin near tornus, strigulae 5-8 with distinct grey striae extending obliquely from costa to R_5; outer margin with distinct dark brown line, broken by orange white strigulae between R_5 and M_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown, anal margin, sclerotized with scale-tufts orange grey to brownish orange, ventral light brown.

Abdomen (Fig. 55.2): Sternum IV and V with large patch of dense, very short scales, dark brown.

Male genitalia (Fig. 55.1): Tegumen with arms broad, moderately dense scaled basolaterally; uncus moderately long, basally widened, apically moderately wide, rounded at apex, with tubular lobe apically, moderately long, apex rounded, projecting dorsally, asetose; socii rather small, arising from tegumen dorsolaterally, subtriangular, densely setose; gnathos arising from near midlength of tegumen, completed band-like, sclerotized, widened, dorsomedially with subtriangular lobe, rounded dorsally, projecting dorsally to between uncus; anellus surrounding basal of aedeagus; aedeagus

rather short, tubular, slightly narrowed to apex; cornuti dense; sacculus with a wide basal opening, moderately dense, long setae basally, median with dense, moderately long, spiniform setae between basal opening and neck, dorsal sparse setae, posteromedial surface with row of dense, long spiniform setae; neck short, deeply concaved ventrally, moderately dense, short, spiniform setae; cucullus moderately broad, rounded dorsally, ventrally pointed, narrowed to acute apex, densely setose, except on ventral area.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP467).

Distribution. Thailand and Java.

Remarks. Specimen was collected during the summer season at 745 m in hill evergreen forest.

Acroclita nigrovenana Kuznetsov, 1988

Figs. 55.3, 55.4

Acroclita nigrovenana Kuznetsov, 1988, Trudy Zool. Inst. Leningrad 176: 88. Type locality: North Vietnam (Vinhphu Province, Tamdao). Holotype (♂): ZMAS.

Description. Wing pattern poorly defined.

Abdomen (Fig. 55.4): Intersegmental area between sternum III and IV, IV and V, V and VI with moderately large patch, with dense short scales.

Male genitalia (Fig. 55.3): Tegumen moderately broad, narrowed ventrally, moderately dense scales on outer margin; uncus large, subtriangular, sparsely long setose, with dense short setae apicoposterior 2/3, apex diverged with pointed, narrowed, horn-like apicolaterally, without setae; socii moderately long, slender, curved, acuted at apex, densely setose; gnathos arising from near half of tegumen

length, widened band-like, slightly sclerotized; anellus surrounding basal of aedeagus; aedeagus long, curved basally; vesica with dense, short microtrichia and denticles apical half; cornuti 16, deciduous; sacculus with moderately dense, long setae basally to ventromedially, median with dense, spiniform setae between basal opening and neck, ventromedially with group of dense setae on posterior surface and dense microtrichia, dorsal sparsely setose; neck short, widened; cucullus rather short, sharp pointed at apex, dense spiniform setae, not at apex, ventrobasally with moderately large, subtriangular lobe, moderately dense setae on ventral margin and strongly short spines near apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'31"N 98°24'27"E, 23 Dec 2001 (1♂, genitalia slide NP47), 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP506), 14°39'02"N 98°31'40"E, 17 Jul 2003 (1♂, genitalia slide NP712).

Distribution. Thailand (new record), Vietnam and Japan.

Remarks. Specimens were collected during the winter season and the rainy season at 195-990 m in mixed deciduous forest and hill evergreen forest.

Aemulatrix Diakonoff, 1982

Aemulatrix Diakonoff, 1982, Zool. Verh. Leiden 193: 32. Type species: *Aemulatrix aequilibra* Diakonoff, 1982.

Aemulatrix has been defined by the following characters; broad-winged, antenna moderately thickened throughout in male. Labial palpus moderately curved and ascending, not appressed to face. Costal and median segments dilated with dense scales, rather roughish and expanding on apex of median segment, terminal segment moderate, slender, smooth. The male genitalia are characterized by long and rather slender tegumen, top with a pair of lateral rows of bristly hairs, vinculum slender, simple. Valva shorter than tegumen, costa curved, apex forming a downcurved

process, crowned with a small spine and a couple of short bristles, sacculus edge deeply excised at 2/3, apical process and posterior half of sacculus beset with dense bristles, especially long on sacculus. Aedeagus over 2/3 valva, straight, little narrowed. Cornuti, a dense sheaf of long, straight spines (Diakonoff, 1982). The genus includes 2 species worldwide and one is from the Oriental region (Brown, 2005).

Aemulatrix aequilibra Diakonoff, 1982

Fig. 55.5

Aemulatrix aequilibra Diakonoff, 1982, Zool. Verh. Leiden 193: 32. Type locality: Sri Lanka (Ratnapura District, Uggalkaltota). Holotype (♂): USNM.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 55.5): Tegumen high, with arms rather narrowed, widened dorsally, scaleless; uncus moderately large and long, slightly narrowed to apex, constricted apicomedially, densely setose; socii absent; gnathos indistinct; caulis long; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately long and wide, slightly narrowed to apex; cornuti as long as aedeagus length, large, moderately dense; juxta triangular; sacculus with large, subtriangular lobe ventromedially, rounded at apex, with dense, long spiniform setae; neck deeply incised ventrally, sparsely setose; cucullus tubular-like, moderately long, extending curved downwardly, dense spiniform setae, apex rounded, with single short, stout spine at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP56).

Distribution. Thailand (new record) and Sri Lanka.

Remarks. Specimen was collected during the winter season at 780 m in hill evergreen forest.

Assulella Kuznetsov, 1973

Assulella Kuznetsov, 1973, Ent. Obozr. 52: 691. Type species: *Eucosma litigiosa* Meyrick, 1912.

The genus includes 5 species worldwide and is most diverse in Oriental region. *Assulella* includes 3 species have been described from Southeast Asia (Brown, 2005).

Assulella archaea Diakonoff, 1983

Figs. 18.6, 56.1

Assulella archaea Diakonoff, 1983, Zool. Verh. Leiden 204: 28. Type locality: Indonesia (Sumatra, Mt. Bandahara, Bivouac Two). Holotype (♂): RMNH.

Description. *Head*: Lower frons white, upper frons light brown mixed with white; labial palpus with first segment white mixed with dark brown, second segment dark brown with white basal half, apical segment dark brown with white basally; vertex orange white intermixed with orange grey.

Thorax: Pronotal collar light brown to brown with white apices; tegulae brown to dark brown with orange white apices mixed with orange white scales medially; mesonotum brown to dark brown mixed with orange white, with white scales posterior end. Forewing (Fig. 18.6): Length 8.38 mm in male (n=5); male costal fold absent, termen slightly concaved between R_5 and CuA_1; ground color orange white mixed with diffuse light brown striae; costal strigulae white, strigulae 1-9 paired and separated by dark brown; fasciae indistinct, basal fascia with irregular dark brown strip, subbasal fascia incompleted present as irregular dark brown strip extending from costa to inner margin; median fascia present as dark brown spot on costa extending as diffuse brown spots from costa to inner margin, discal cell with indistinct greyish orange patch intermixed with diffuse light brown and dark brown spots; postmedian fascia present as dark brown spot on costa; ocellus region with dark brown strip extending from R_5 to tornus; outer margin with distinct dark brown strip extending

from wing apex to CuA_1, terminal strigulae absent. Underside brown with yellowish grey spots on costa. Hindwing brown dorsally with inner margin sclerotized with light brown hair pencils along inner margin, ventral light brown with grey of hair pencils on anal area extending from near wing base, brown. Hindtibia with dense hair pencils, dark brown basally.

Male genitalia (Fig. 56.1): Tegumen with arms narrowed, widened and rounded apically, densely scaled near ventral half of tegumen; uncus absent; socii with moderately long, narrowed plate, arising from tegumen apicolaterally, densely setose; gnathos arising from midlength of tegumen, narrowed band-like, sclerotized basally, weakly sclerotized medially, with two narrow sclerotized band arising from upper margin, projecting oblique dorsally; caulis long and slender; anellus closely basal 1/3 of aedeagus; aedeagus short, swollen basally, apical narrowed, with dense cornuti apically, long half of aedeagus length; valva deeply incised ventrally forming neck; sacculus large, with small group of short setae basally, ventromedial lobe with dense short spines extending towards median area, with dense, long setae on membranous plate extending over basal opening, median with moderately dense setae between basal opening and neck, dorsal with group of dense short tiny spines near costal hook and sparse setae towards cucullus; cucullus short, large plate, widened medially, apically rounded, dense long setae with long spines apically, apical margin with sparse, short spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (4♂, genitalia slide NP145, NP132, NP130, NP127), 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♂, genitalia slide NP98).

Distribution. Thailand and Indonesia.

Remarks. Specimens were collected during the winter season at 1,015-1,040 m in hill evergreen forest.

Bipativalva Kuznetsov, 1988

Bipartivalva Kuznetsov, 1988, Trudy Zool. Inst. Leningrad 176: 80. Type species: *Bipartivalva aquilana* Kuznetsov, 1988

The genus includes 2 species worldwide and 1 species has been described from Southeast Asia (Brown, 2005).

Bipartivalva aquilana Kuznetsov, 1988

Fig. 56.2

Bipartivalva aquilana Kuznetsov, 1988, Trudy Zool. Inst. Leningrad 176: 80. Type locality: North Vietnam (Sonla Province, Naniu). Holotype (♂): ZMAS.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 56.2): Tegumen with arms, moderately broad, widened apically, scaleless; uncus absent; socii forming large, rounded lobe, fused with tegumen apicolaterally, dense spiniform setae; gnathos arising from midlength of tegumen, completed band-like, sclerotized basally; anellus cup-like, surrounding basal 1/3 of aedeagus; aedeagus moderately long, basal half widened, narrowed to apex; cornuti absent; juxta triangular; sacculus with apicomedial margin deeply incised, ventral margin densely setose, ventromedially with moderately long, tubular lobe, extending from basal opening margin, sparsely setose, apically with short, dense setae, dorsal with group of dense, long setae; neck slightly concaved; cucullus long, clavate-shaped, rounded at apex, dense spiniform setae towards neck.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 23 Aug 2003 (1♂, genitalia slide NP666).

Distribution. Thailand (new record) and North Vietnam.

Remarks: Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Coniostola Diakonoff, 1961

Coniostola Diakonoff, 1961, Annls Soc. Ent. Fr. 130: 71. Type species: *Eucosma stereoma* Meyrick, 1912.

The genus has only 2 spices worldwide and 1 species has been described from the Oriental region (Brown, 2005).

Unplaced *Coniostola*

Coniostola sp. A

Figs. 18.7, 56.3, 87.6

Description. *Head*: Lower frons yellowish white, upper frons greyish orange, labial palpus with first segment yellowish white, second segment yellowish white mixed with light brown ventrally, apical segment yellowish grey with brown spot dorsomedially, vertex orange white intermixed with pale orange.

Thorax: Pronotal collar light brown with yellowish white apices, tegulae orange white intermixed with greyish orange, with dark brown spots basally; mesonotum yellowish white to orange white mixed with brown strip anteriorly and dark brown posteriorly. Forewing (Fig. 18.7): Length 4.46 mm in male (n=7), 4.72 mm in female (n=7), termen slightly concave between wing apex and M_3, ground color orange white to pale orange; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal fascia indistinct present as grey spot on inner margin close to wing base and irregular line extending obliquely from costa to midwing, angled and extending to inner margin; subbasal fascia present as irregular dark brown strip extending obliquely from costa to midwing, angled and extending obliquely to inner margin; median fascia incompleted , extending obliquely from costa

to R vein and extending irregularly as spots to inner margin; postmedian fascia distinct extending obliquely from costa to outer margin between M_1 and M_2, strigulae 4 with brownish grey striae extending from costa to midwing, strigulae 5 and 6 with grey striae extending obliquely from costa to R_5 fused at R_5 and extending as irregular large strip to inner margin near tornus, strigulae 7 and 8 with grey striae, fused, extending from costa to outer margin at R_5; ocellus region with three dark brown spots between R_5 and M_3; outer margin with yellowish white small patch between M_2 to between CuA_1 and CuA_2, and terminal strigulae between R_5 and M_1, yellowish white. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Male genitalia (Fig. 56.3): Tegumen with arms, broaded basal half, apical half moderately broaded, apex rounded, apicolateral 1/4 of tegumen length with group of sparse setae; uncus and socii absent; gnathos arising from basal 1/3 of tegumen, band-like, membranous; caulis long; anellus connected with aedeagus basolaterally; aedeagus long, basal 1/5 swollen, abruptly narrowed to apex; cornuti absent; sacculus with group of short, dense setae basally, median with dense, moderately long setae between basal opening and ventromedial margin, with sparse, short setae on basal opening marginal area, dorsal with short, dense setae, extending towards neck medially; neck concaved ventrally; cucullus enlarged, suboval-shaped, dense long and short spines apically, sparsely setose.

Female genitalia (Fig. 87.6): Sternum VII with large sclerotized plate, posterior margin slightly concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII and triangular lateral extensions with sparsely setose, without scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced; ostium bursae covered by sternum VII, lamella postvaginalis distinct forming two long, large patch extending posteriorly, separated by narrowed groove medially, dense microtrichia, with sparsely setose on posterior margin; antrum forming a wide, sclerotized cup; ductus bursae long and narrowed; ductus seminalis arising from near anterior end of corpus bursae, with distinct

sclerotized ring, widened on corpus bursae; corpus bursae with two signa, spine-like, dilated basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°42'26"N 98°24'37"E, 10 Mar 2002 (1♀, genitalia slide NP286), 14°38'28"N 98°35'02"E, 16 Mar 2002 (2♀, genitalia slide NP252, NP264), 14°33'51"N 98°37'58"E, 23 Apr 2002 (1♂, genitalia slide NP359, 1♀, genitalia slide NP353), 14°39'02"N 98°31'40"E, 22 Dec 2003 (1♂), 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♀), 14°41'43"N 98°27'34"E, 19 Feb 2004 (3♂, genitalia slide NP593, 1♀), 14°41'17"N 98°24'02"E, 21 Feb 2004 (2♂, genitalia slide NP594, 1♀, genitalia slide NP623).

Remarks. Specimens were collected during the winter season and the summer season at 195-1,040 m in mixed deciduous forest and montane evergreen forest.

Emrahia Koçak, 1981

Emrahia Koçak, 1981, Priamus 1: 120. [replacement name for *Scoliographa*].

Scoliographa Diakonoff, 1975, Zool. Meded. 48: 312. Type species: *Argyroploce hoplista* Meyrick, 1927. [preoccupied].

Emrahia includes 2 species worldwide that have been described from the Oriental region (Brown, 2005).

Emrahia hoplista (Meyrick), 1927

Figs. 56.4, 88.1

Argyloploce hoplista Meyrick, 1927, Exotic Microlepid. 3: 340. Type locality: Indonesia (Sumatra, Sinabaeng). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 56.4): Tegumen with arms, broaded, densely scaled laterally; uncus moderately long, slightly widened medially, truncated at apex, densely spines laterally; socii subtriangular lobe, rather small, arising from base of uncus, densely long setose; caulis moderately long; anellus closely surrounding basal of aedaegus; aedeagus long, slightly narrowed to apex, curved medially; cornuti one, moderately long; sacculus with basal opening widened, with small group of short, sparsely setose medially on membrane, basal without setae, median with narrowed area, ventromedial margin sparsely setose, dorsal sparsely setose; neck long, sparsely setose; cucullus subtriangular, with long, dense spiniform setae, dorsoapically rounded, ventroapically acuted, pointed ventrally.

Female genitalia (Fig. 88.1): Sternum VII moderately sclerotized, dense scales, sparsely setose; tergum VIII with row of setae near posterior margin, fused with sternum VIII forming sclerotized plate, sternum VIII concave posteromedially, without scales or setae, extended to combined with lamella postvaginalis, forming sclerotized plate, with lobe anterolaterally; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced; ostium bursae margin with microtrichia; ductus bursae forming sclerotized posterior 1/3 to ostium bursae, anterior 1/3 with small lobe; ductus seminalis arising from near anterior 1/3 of ductus bursae; corpus bursae with one large signum, cup-like, oval at base, one edge thickened.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°33'14"N 98°34'33"E, 17 Mar 2002 (2♂, genitalia slide NP268, NP269), 14°35'08"N 98°38'20"E, 18 Apr 2002 (2♂, genitalia slide NP317, NP320), 14°34'04"N 98°38'52"E, 22 Apr 2002 (1♀, genitalia slide NP351).

Distribution. Thailand (new record) and Sumatra.

Remarks. Specimens were collected during the summer season at 250-360 m in mixed deciduous forest and dry evergreen forest.

Epinotia Hübner, [1825] 1816

Epinotia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 377. Type species: *Phalaena (Tortrix) similana* Hübner, 1793.

Astatia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 377. Type species: *Tortrix parmatana* Hübner, [1814-1817].

Asthenia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 381. Type species: *Tortrix pygmaeana* Hübner, [1796-1799].

Panoplia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 293. Type species: *Tortrix augustana* Hübner, [1811-1813].

Acalla Hübner, [1825] 1816, Verz. Bekannter Schmett.: 383. Type species: *Tortrix ophtalmicana* Hübner, [1796-1799].

Evetria Hübner, [1825] 1816, Vrez. Bekannter Schmett.: 378. Type species: *Tortrix piceana* Hübner, [1796-1799].

Poecilochroma Stephens, 1829, Nom. Br. Insects: 47. Type species: *Phalaena (Tortrix) solandriana* Linnaeus, 1758.

Steganoptycha Stephens, 1829, Nom. Br. Insects: 47. Type species: *Pyralis boeberana* Fabricius, 1787.

Paedisca Treitschke, 1830, in Ochsenheimer, Schmett. Eur. 8: 188. Type species: *Tortrix parmatana* Hübner, [1814-1817].

Paragrapha Sodoffsky, 1837, Bull. Soc. Imp. Nat. Moscou 1837 (6): 92. [unnecessary replacement name for *Paedisca*].

Hypermecia Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 173. Type species: *Tortrix augustana* Hübner, [1811-1813].

Phlaeodes Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 172. Type species: *Tortrix frutetana* Hübner, [1823-1824].

Pamplusia Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 180. Type species: *Coccyx monticolana* Duponchel, 1842.

Cartella Guenée, 1845, Annls. Soc. Ent. Fr. (2) 3: 174. Type species: *Tortrix cretaceana* Frölich, 1828.

Steganoptera Herrich-Schäffer, 1851, Syst. Bearbeitung Schmett. Eur. (1849): 133. [misspelling of *Steganoptycha*].

Lithographia Stephens, 1852, List Specimens. Br. Anim. Colln. Br. Mus. 10: 32. Type species: *Phalaena nisella* Clerck, 1759.

Curtella Stainton, 1859, Man. Br. Butterflies Moth 2: 201. [misspelling of *Cartella*].

Proteopteryx Walsingham, 1879, Illust. Typical Specimens Lepid. Heterocera. Colln. Br. Mus. 4: 68. Type species: *Proteopteryx emarginana* Walsingham, 1879.

Phloeodes South, 1884, Synon. List Br. Lepid.: 25. [misspelling of *Phlaeodes*].

Epinotis Kearfott, 1907, Trans. Am. Ent. Soc. 33: 51. [misspelling of *Epinotia*].

Neurasthenia Pierce & Metcalfe, 1922, Genitalia Group Tortricidae Lepid. Br. Is.: 65. Type species: *Tortrix pygmaeana* Hübner, [1796-1799].

Evertia Matsumura, 1931, 6000 Illust. Insects Japan-Empire: 1070. [misspelling of *Evetria*].

Hamuligera Obraztsov, 1946, Z. Wien. Ent. Ges. 30: 31. Type species: *Phalaena trimaculana* Donovan, [1806].

Epinotia has been described by the following characters; small- or medium-sized moths, with variable external appearance. Some species represented by large number of color variations; hence precise specific identification possible only on basis of structure of genitalia. Discal cell in forewings separated by trunks of R and M, R_4 and R_5 free. Forewing of male with costal folded presented. Uncus developed and often upper fultura present in form of two ribs extending from base of socii towards aedeagus. Apex of sacculus usually with group of short, thick, pigmented spinules or setae (Kuznetsov, 1987). The genus includes 166 species worldwide and 7 species have been described from Southeast Asia (Brown, 2005). Larvae found in open leaf buds, in roll leaves, or in branches of arboreal plant (Kuznetsov, 1987)

Epinotia canthonias (Meyrick), 1920
Figs. 18.8, 57.1

Acroclita canthonias Meyrick, 1920, Exotic Microlepid. 2: 343. Type locality: India (Bengal, Pusa). Holotype (♀): BMNH.

Description. *Head*: Lower frons orange white, upper frons brown to dark brown; labial palpus with first segment orange white, second segment dark brown with yellowish white dorsobasally and medially, apical segment brown; vertex dark brown mixed with orange white.

Thorax: Pronotal collar brown to dark brown; tegulae dark brown mixed with orange white; mesonotum dark brown intermixed with brownish orange to light brown, with orange white at posterior end. Forewing (Fig. 18.8): Length 4.15 mm in male (n=6); male costal fold absent, termen slightly concaved between wing apex and CuA_1; ground color greyish orange to brownish orange; costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal fascia indistinct on wing base, diffused brown mixed with dark brown; subbasal fascia distinct on costa extending

dislocated to inner margin, brown mixed with dark brown; median fascia distinct on costa extending from costa to midwing, dark brown, pretornal subtriangular spot indistinct; ocellus region with irregular dark brown patch extending from R_4 to tornus, with brownish grey strip near outer margin extending from R_5 to CuA_1, strigulae 8 and 9 with grey striae extending obliquely to R_5; wing apex dark brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally with slender scales, dark brown covered basal 2/3, ventrally light brown.

Male genitalia (Fig. 57.1): Tegumen narrowed, widened apically, with moderately dense scales along outer margin; uncus short, bilobed apically, acuted at apex, slightly hooked apically; socii arising from base of uncus, moderately long, apex rounded, densely setose; gnathos arising from midlength of tegumen, sclerotized, band-like; anellus closely surrounding base of aedeagus; aedeagus moderately long, slightly curved basally, cornuti nine, extending along apical half, ventroapical margin with small one denticle; sacculus with sparsely setose basally, small group of short setae medially, sparse setae and lightly spines between basal opening and neck, ventromedially with group of moderately long setae, dorsal with sparse setae towards cucullus; neck indistinct; cucullus short, apically rounded, dense spiniform setae, with sparsely setose on margin, basal with sparse strong spines, ventrobasally with small lobe, bearing two short, strong spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 12 Mar 2002 (1♂, genitalia slide NP293), 29 Sep 2002 (1♂, genitalia slide NP489), 14°33'51"N 98°37'58"E, 23 Apr 2002 (1♂, genitalia slide NP358), 14°41'27"N 98°27'29"E, 14 May 2002 (1♂, genitalia slide NP529), 14°40'03"N 98°36'07"E, 19 Jul 2003 (1♂, genitalia slide NP632), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP642).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected throughout the year at 180-1,040 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Eucoenogenes Meyrick, 1939

Eucoenogenes Meyrick, 1939, Trans R. Ent. Soc. Lond. 89: 49. [replacement name for *Caenogenes*].

Caenogenes Meyrick, 1937, Exotic Microlepid. 5: 159. Type species: *Caenogenes melanancalis* Meyrick, 1937. [preoccupied].

Eucoenogenes Meyrick 1939 was proposed as a replacement name for *Caenogenes* Meyrick 1937, which was preoccupied by *Caenogenes* Walsingham 1887. Meyrick 1937 described the type species, *Caenogenes melanancalis*, based on two specimens reared from larvae mining leaves of *Eugenia jambolana* Lamark (Myrtaceae) in India. Meyrick defined the genus by the thickened palpus with densely appressed scales concealing the third segment, the absence of the R_4 vein in the forewing, and absence of the M_2 vein in the hindwing. Clarke (1958) designated a female as lectotype, noting that "the male is missing," even though Meyrick indicated that both specimens were female in his original description. However, Clarke (1955) previously noted that Meyrick often misidentified sexes because of his reliance on a hand lens and emphasis of non-genitalic characters; thus, the sex and present location of the second specimen is uncertain. In contrast to Meyrick's description, Clarke's figure of venation showed that both R_4 in the forewing and M_2 in the hindwing were present and that all veins were separate except the fused anal veins in the forewing and the stalked M_3-CuA_1 in the hindwing; this venation has been confirmed by a re-examination of the venation of the lectotype.

Diakonoff (1967) considered the female genitalia of *E. melanancalis* to lack characters of generic significance, and considered the palpi with appressed scales and concealment of the third segment to be the only character defining the genus. Based on similar palpi, Diakonoff described *E. deltostoma* based on a single male specimen

from the Philippine Islands. This description of the male genitalia gave an identity to the genus that was lacking in Meyrick's description, specifically the possession of enlarged spiniform setae originating from the sacculus. Subsequently, additional species of *Eucoenogenes* have been described or transferred to the genus based largely on the possession of the saccular spiniform setae. These species vary, some intraspecifically, in the degree that the scales of the second segment of the labial segment are appressed and cover the third segment; thus this character may be an artifact of individual specimens. Other characters for defining the genus have not been provided previously.

Eucoenogenes currently includes 13 species occurring in the Oriental and Eastern Palearctic Regions. Three species have been reported previously from Thailand (Kawabe 1989): *ancyrota* Meyrick 1907, *euphlebia* Kawabe 1989, and *japonica* Kawabe 1978. In addition to these three species and *E. melanancalis* and *E. deltosoma*, other species of *Eucoenogenes* include *aestuosa* and *cyanopsis*, described by Meyrick (1912) from India, *levatana* Kuznetsov (1997a) and *segregana* Kuznetsov (1997b) from South Vietnam, *pythonias* Meyrick, 1910 from Java, and *teliferana* Christoph, 1882 from Vladivostok, Russia, *bicuculla* and *vaneeae* (Pinkaew, 2005), the sole species occurring outside the Oriental Region.

Eucoenogenes bicuculla Pinkaew, new species

Figs. 19.1, 57.2, 88.2

Diagnosis. The male of this species differs from other species in the genus in having a wide, flat hind tibia with dense, setiform scales closely appressed to medial and lateral surfaces. The anal margin of the hindwing bears a dark brown hair pencil basally and a row of long, yellowish white hairs beyond wing base. The male genitalia differ from those of other species by the cucullus being divided into dorsal and ventral lobes. The female is similar to that of *Eucoenogenes munda*, but the seventh sternum is quadrate, not rounded, and has microtrichia that are restricted to its posterolateral corners.

Description. *Head*: Upper frons with light brown mixed with brownish orange, lower frons with brown to dark brown mixed with light brown; labial palpus with first segment dark brown at base, remainder yellowish white, second segment yellowish white to pale orange with dark brown spots basally, dorsomedially, ventroapically at 2/3 length, and apically, apical segment brown dorsally, yellowish white ventrally; vertex brownish orange to light brown mixed with brown laterally.

Thorax: Pronotal collar with anterior short scales brown, posterior long scales light brown with orange white apices; tegulae brown mixed with dark brown basally, light brown mixed with orange white apically; mesonotum pale orange mixed with light brown to dark brown, with transverse, dark brown band medially. Forewing (Fig. 19.1): Length 6.50 mm in male (n=4), 7.4 mm in female (n=2); male costal fold absent; R_4-R_5 stalked 2/5 length of R_5, termen slightly concave, ground color greyish yellow mixed with brownish orange, with diffuse dark brown transverse lines, costal strigulae 1-9 paired, pale yellow, and separated by dark brown, termen with strigulae forming pale yellow spots between R_4 and R_5, R_5 and M_1, and M_1 and M_2; basal fascia indistinct, with scattered, dark brown scales between wing base and strigulae 1 from costa to inner margin; subbasal fascia distinct between strigulae 2 and 3 from costa to R, dislocated apically from middle of discal cell to inner margin, dark brown on margins, mixed with brownish orange medially; median fascia dark brown on costa between strigulae 4 and 5, indistinct from near costa to inner margin, distal margin extending obliquely outward as narrow dark brown line bordering with brownish orange scales from costa to R_5, angled at R_5, and extending basally to middle of discal cell; silvery striae originating from strigulae 5 and 6 and extending obliquely to R_5, striae from strigulae 7-9 extending obliquely to R_5, confluent from R_5 to tornal area along outer margin, striae separating brownish orange lines originating from dark brown spots between strigulae, orange line between strigulae 5 and 6 extending to R_1, orange line between strigulae 6 and 7 extending to R_5, orange line between strigulae 7 and 8 confluent with orange line from between strigulae 8 and 9 and extending to R_5; ocellar region with diffuse dark brown lines from R_5 to inner margin near tornus; wing apex dark brown between R_4 and R_5; outer margin with distinct dark brown line from apex to CuA_1; fringe orange white mixed with brown and dark brown. Underside

light brown, with yellowish grey strigulae on costa and between veins on outer margin. Hindwing: brown dorsally; male with scales narrow between anal margin and CuA_2, anal margin rolled dorsally in spread specimens and bearing row of hair pencils, basal 2/3 of row dark brown basally, yellowish white apically; ventrally light brown, with dense brown scales on basal 2/3 of costal area, with yellowish white, narrow scales on rolled anal area; male hindtibia wide, flattened and densely covered dorsally and laterally with specialized long, hair-like scales adhering closely to surface.

Male genitalia (Fig. 57.2): Tegumen moderately wide, dorsally rounded, with moderately long setae medially; uncus short, bilobed dorsally, with rounded ventral projection extending over socii bases; socii arising from base of uncus, moderately long, apically rounded, densely setose dorsoapically; gnathos arising from dorsal 2/3 of tegumen, membranous; anellus closely surrounding base of aedeagus; aedeagus moderately long, curved medially, with eight cornuti extending along apical 1/3; juxta triangular; sacculus sparsely setose basally, densely setose medially between basal opening and neck, ventral margin with dense small setae between basal opening and neck, microtrichia relatively dense on medial surface from near base of sacculus to apical margin of basal opening, ventrolateral area of valva with row of 4-7, long, spiniform setae, setae with attenuate apices; valva deeply incised to form narrow neck; cucullus moderately incised apicomedially with dorsal portion forming a long rounded lobe, densely setose except apical 1/3, ventral portion forming rounded lobe, larger than dorsal lobe, densely setose except ventrobasal margin (3 slides examined).

Female genitalia (Fig. 88.2): Sternum VI with sparse microtrichia on posteromedial margin. Sternum VII with large sclerotized plate, scales moderately dense on posterior half and lateral areas, becoming more dense towards posterior margin, anteromedial area scaleless, sparsely setose on posterior half, microtrichia restricted to lateral margins; tegumen VIII without setae or scales dorsomedially, with sparse setae and moderately dense scales and microtrichia on lateral triangular extensions; papillae anales with dense setae, lateral setae with papillose bases; sterigma reduced; ostium bursae behind sternum VII, antrum forming a wide, sclerotized cup, colliculum small, weakly sclerotized, ductus bursae encircled by large

sclerotized plate medially, divided anteriorly to form two triangular projections extending into corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two signa, blade-like, rounded at apex, right signum larger than left signum (1 slide examined).

Holotype. ♂. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 30 Jul. 2002, N. Pinkaew, [specimen no.] N10, ♂ [genitalia slide] NP 391. Data given as on three labels except for bracketed information. Deposited in U.S. National Museum.

Paratypes. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 23 Dec. 2001, (1♂, genitalia slide NP41), 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♀, genitalia slide NP141), 14°41'40"N 98°24'15"E, 5 Feb. 2002 (1♂, genitalia slide NP 231), 14°41'41"N 98°24'12"E, 6 Feb. 2002 (1♀, genitalia slide NP 180), 14°41'34"N 98°24'06"E, 12 Jan. 2002 (1♂, genitalia slide NP105), all collected by N. Pinkaew. Deposited in Department of Entomology collection, Kasetsart University, and Mississippi Entomological Museum.

Etymology. The name of this species refers to the division of the male cucullus into two parts.

Remarks. The expanded hind tibia with specialized sex scales in the male is unique among species of *Eucoenogenes*. These tibial sex scales may be involved in production of the pheromone that is disseminated by hair pencils on the hindwing, similar to pheromone systems in males of other species of Lepidoptera. This species was collected during dry winter and early rainy seasons in hill evergreen forest at 980-1,000 m.

Eucoenogenes cyanopsis (Meyrick), 1912
Figs. 19.2, 57.3

Eucosma cyanopsis Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 866. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Eucosma melanochlaena Meyrick, 1936, Exotic Microlepid. 4: 611. Type locality: Indonesia (Java, Mt. Gede). Holotype (♂): BMNH.

Description. *Head*: Upper frons with long, yellowish white to orange white, with light brown scales laterally, lower frons orange white with light brown scales medially; labial palpus with first segment yellowish white, with light brown spot apicomedially, second segment yellowish white, with light brown basally, with small spot, light brown, dorsally, with light brown on ventroapically and apically, apical segment yellowish grey, with light brown basally; vertex yellowish white to orange white posteriorly, mixed with pale orange anteriorly, yellowish white scales posterior to chaetosemata, row of dark brown mixed with orange white posterior to eye.

Thorax: Pronotal collar brown mixed with dark brown; tegulae light brown mixed with dark brown basal half, apical half with long scales, brown with yellowish white basally; mesonotum yellowish white to orange white, with dark brown anteriorly close to pronotal collar. Forewing (Fig. 19.2): Length 6.13 mm in male (n=1); male costal fold absent, termen slightly concave between R_5 and M_3, ground color and costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown, strigulae 1-4 indistinct, strigulae 10 forming spot on termen; basal fascia fused with subbasal fascia and median fascia, present distinct as large patch, brown to dark brown, some specimens metallic dark blue when viewed at angle to light, extending from costa between wing base and proximal margin of strigulae 5 to 1A+2A, distal margin of patch rounded, postmedian fascia extending diagonally from costa between strigulae 6 and 7 to outer margin at R_5, small spot on inner margin near tornus, brown to dark brown, between inner margin to CuA_1, diffuse brown to dark brown spot between R_5 and M_3, near inner margin; outer margin with distinct brown striae,

broken by strigulae between R_5 and M_1. Underside light brown with yellowish white on costa and between veins on outer margin. Hindwing brown dorsally, ventrally light brown, with group of dense sex scales along anal margin, yellowish white basal half, with pale grey apical half.

Male genitalia (Fig. 57.3): Tegumen with arms moderately broad, widened apically; uncus short, slightly narrowed medially, bifurcated, pointed at apex, moderately dense setae basally; socii moderately large, subtriangular, rounded at apex, pendant from base of uncus, densely setose; gnathos arising from midlength of tegumen, widened band-like; anellus closely surrounding basal 1/3 of aedeagus, aedeagus long, moderately wide, slightly narrow to apex; cornuti moderately dense, deciduous; sacculus large with widened basal opening, with group of moderately dense setae basally, median sparsely setose, dorsomedial area moderately dense setae, outer margin with widened round lobe bearing group of dense, moderately long setae, with row of dense, long spiniform scales along apical half of outer marginal area, between sacculus and neck ventrally with 3 wide and moderately long spiniform scales, lanceolate-shaped; neck distinct, deeply incised ventrally; cucullus suboval-shaped, dense spines and setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan. 2002, (1♂, genitalia slide NP121).

Distribution. Thailand, Japan, India and Java.

Remarks. Specimen was collected during the winter season at 1,040 m in hill evergreen forest.

Eucoenogenes munda (Diakonoff), new combination
Figs. 19.3, 57.4, 88.3

Epinotia munda Diakonoff, 1983, Zool. Verh. Leiden 204: 40. Type locality: Indonesia (Sumatra, Mt. Bandahara, Bivouac One). Holotype (♀): RMNH.

Description. *Head*: Upper frons orange white to pale orange mixed with brownish orange, light brown laterally, lower frons light brown to brown; labial palpus with first segment light brown mixed with brown, second segment brownish orange, with dark brown spots basally, dorsomedially, and ventrally at 2/3 length, and brownish orange spot apically, apical segment orange white; vertex yellowish white, eye bordered posteriorly by row of brown and dark brown scales.

Thorax: Pronotal collar and tegulae brown mixed with dark brown; mesonotum brown mixed with yellowish white and dark brown. Forewing (Fig. 19.3): Length 7.32 mm in male (n=3), 6.90 mm in female (n=1), male costal fold absent, venation (Fig. 3) with R_4-R_5 stalked 1/3 length of R_5, termen concave between apex and M_3, ground color brownish orange mixed with brown, inner margin with patch extending from basal fascia to pretornal spot and medially to 1A+2A, yellowish white mixed with brownish grey; costal strigulae 1-9 paired, orange white to pale orange, separated by dark brown spots or short lines; basal fascia with scattered dark brown scales, distal margin extending as dark brown line from costa near strigulae 1 to inner margin; subbasal fascia present as dark brown spot between strigulae 2 and 3 and extending from costa to R, dislocated apically to form brownish orange spot with dark brown margins between middle of discal cell and 1A+2A; median fascia indistinct, present as dark brown spot on costa between strigulae 4 and 5; postmedian and preterminal fasciae present as dark brown spots on costa between strigulae 6 and 7 and 8 and 9, respectively; apex with dark brown spot extending into adjacent fringe scales; pretornal subtriangular spot extending from inner margin to CuA_1, brownish orange with dark brown margins; ocellar region with a dark brown line extending from R_5 to CuA_1, scalloped between veins, outer margin with distinct dark brown line, broken by orange white, unpaired strigulae between R_5 and M_1, M_1 and M_2, and CuA_1 and CuA_2. Underside light brown, strigulae on costa and termen yellowish grey to yellowish white. Hindwing brown dorsally, ventrally light brown.

Male genitalia (Fig. 57.4): Tegumen narrow basally, dorsal 1/3 widened, with moderately dense setae dorsomedially; uncus short, apices pointed; socii pendant from base of uncus, apically rounded, moderately setose; gnathos arising from midlength of

tegumen, membranous; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, apically tapered, dorsoapical 1/3 unsclerotized, cornuti moderately dense; juxta triangular; valva with small group of setae basally and large group dorsally at midlength, ventromedial area at midlength with small, rounded lobe, long setae arising from between lobe and ventral margin, microtrichia present on medial surface from near base to rounded lobe, ventrolateral surface of valva with group of long, spiniform setae surrounded by microtrichia, some setae with deeply bifid apices at high magnification (400X), base of neck with a long, ventrally projecting, digitate projection, projection usually asetose, one specimen with a few setae near middle of one projection, cucullus small, rounded, densely setose (2 slides examined).

Female genitalia (Fig. 88.3): Sternum VI densely microtrichiate on posterior half. Sternum VII densely microtrichiate except on posterolateral corners, densely setose on posterolateral corners and posteromedial area, asetose on remainder of sclerite; tergum VIII with moderately dense scales and microtrichia on lateral triangular projections; papillae anales with dense setae, some lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis moderately sclerotized, with dense microtrichia and moderately dense scales; ostium bursae opening into wide, cup-like antrum; colliculum small, ring-like; ductus bursae with large sclerotized plate on anterior half, narrowly encircling ductus near middle, incompletely sclerotized on ventral side, with two, anterior extensions into corpus bursae, apices acute; ductus seminalis arising from anterior 1/4 of ductus bursae; corpus bursae with two signa, blade-like, apices acute (1 slide examined).

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP61), 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP104), 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP172, 1♀, genitalia slide NP173), all collected by N. Pinkaew.

Distribution. Thailand (new record) and Indonesia.

Remarks. This species was described based on a single female from Mt. Bandahara at 810 m in Atjeh, Sumatra. The type specimen was not examined, but the illustrated imago and genitalia are identical to female specimens from Thailand. These female specimens share a similar seventh sternite and sclerotization of the ductus bursae, unlike other known *Eucoenogenes*. Specimens from Thailand were collected during the dry winter season at 980-1,000 m in hill evergreen forest.

Eucoenogenes vaneeae Pinkaew, new species

Figs. 19.4, 58.1, 58.2, 88.4

Diagnosis. The male of this new species differs from related species in having long, hair pencils arising from anterolateral pockets of sternum VIII, a sacculus bearing spiniform setae with distal scales having bifid apices and basal scales having trifid apices, and a valva that is rotated at the neck to produce a ventrally facing cucullus. This species is most similar to *E. levatana* Kuznetsov (1997 a) in the form of the spiniform scales on the sacculus and the presence of a narrow cucullus, but differs in having the uncus narrowed medially and a rotated valval neck with a ventrally facing cucullus. A forewing costal fold is presented in *E. levatana*, but is absent in this new species.

Description. *Head*: Upper frons brownish orange mixed with brown to dark brown laterally, lower frons yellowish white, dark brown laterally; labial palpus (Fig. 2) with first segment orange white to pale orange, with dark brown spot apically, second segment orange white with small, dark brown spot basally, confluent with spot on first segment, dorsomedial area with small, dark brown spot, narrowly separated from large, dark brown, ventroapical spot at 2/3 length, latter spot narrowly separated from large, dark brown apical spot, apical segment orange white ventrally, dark brown dorsally; vertex dark brown anteriorly, orange white posteriorly, eye posteriorly bordered by row of dark brown and light brown scales.

Thorax: Pronotal collar brown to dark brown mixed with light brown; tegulae dark brown mixed with light brown on basal half, light brown mixed with brown on

apical half; mesonotum dark brown, with transverse light brown band.
Forewing (Fig. 19.4): Length: 5.77 mm in male (n=4), 6.34 mm in female (n=5), male costal fold absent, R_4 and R_5 stalked 1/6 length of R_5, termen concave between R_5 and M_3; ground color yellowish white mixed with pale orange and brownish grey; costal strigulae orange white to orange grey basally, yellowish white apically, strigulae 1-9 paired and separated by dark brown, except some specimens with strigulae 6 singled, termen with yellowish white strigulae between R_5 and M_1; basal fascia indistinct, with dark brown spot divided by orange white scales between costa and R and irregular rows of dark brown scales between R and inner margin; subbasal fascia with dark brown proximal and distal margins enclosing brownish orange mixed with orange grey, distinct on costa between strigulae 2 and 3 and extending to near middle of discal cell, dislocated apically between middle of discal cell and inner margin; median fascia dark brown mixed with orange, extending obliquely from costa between strigulae 4 and 5 to R_5, widened at R_5 and extending transversely to 1A+2A, with narrow, apically directed spur on R_5, broken by ground color at M stem in discal cell; pretornal spot subtriangular, dark brown mixed with orange surrounded by dark brown on proximal and distal margins, postmedian fascia extending obliquely from costa between strigulae 6 and 7 to R_5 near outer margin, dark brown on costa, orange with some brown on distal margin from strigulae to R_5, strigulae 5 and 6 with silvery striae becoming confluent and bordering postmedian fascia to R_5, strigula 7 with silvery stria extending obliquely to R_5, strigulae 8 and 9 with striae reduced to small silvery spots, outer margin with silvery stria (possibly confluent striae) extending from M_2 to CuA_2, broken near CuA_1 by ground color; ocellar region with dark brown patch between R_5 and CuA_1, outer margin with dark brown line from apex to CuA_1, broken by strigula between R_5 and M_1. Underside light brown with yellowish grey strigulae on costa and between R_5 and M_1 on outer margin. Hindwing brown dorsally, ventrally light brown.

Abdomen (Fig. 58.2): Male sternum VIII with two, brown hair pencils arising from pockets on anterolateral corners.

Male genitalia (Fig. 58.1): Tegumen narrow ventrally, widened at midlength, with dense long setae along outer margin of ventral 2/3; uncus short, narrowed medially, bifid; socii pendant from base of uncus to near half of tegumen length, densely setose, apically rounded; gnathos arising from midlength of tegumen, sclerotized basally, membranous apically; anellus closely surrounding basal 1/4 of aedeagus, extending dorsally to 1/3 length; aedeagus moderately long, not greatly tapered apically, with dense cornuti; juxta triangular, truncated ventrally; valva with group of sparse setae along ventrobasal margin of sacculus and group of dense setae medially between basal opening and neck, ventroapical margin of sacculus with short and spiniform setae, ventrolateral surface of valva with large group of long, spiniform, flattened setae with multidentate apices basally and rounded, spiniform setae with bidentate apices towards neck, setiform setae bordered basally by microtrichia, neck narrow, asetose, rotated near middle with cucullus facing ventrally, cucullus narrow, with dense, short setae basally, acute and sparsely setose apically (4 slides examined).

Female genitalia (Fig. 88.4): Sternum VI densely microtrichiate on posterior 2/3. Sternum VII densely scaled and microtrichiate, sparsely setose; tergum VIII moderately scaled on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis short, sparsely setose and densely microtrichiate; antrum forming long, lightly sclerotized cup; colliculum small, not encircling ductus bursae; ductus bursae with long sclerotized band encircling 2/3 of ductus circumference, completely encircled by narrow band near middle and posterior to inception of ductus seminalis, apically rounded without projections into corpus bursae; corpus bursae with two, blade-like signa, smaller signum on posterior margin of corpus bursae near connection with ductus bursae (1 slide examined).

Holotype. ♂. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41′31″N 98°24′27″E, 13 May 2002, N. Pinkaew; [specimen no.] N96, ♂ [genitalia slide] NP 464. Data given as on three labels except for bracketed information. Deposited in USNM.

Paratypes. Thailand: same data as holotype (1♂, genitalia slide NP452, 2♀), same data except 14°41'43"N 98°24'34"E, 15 May 2002 (1♂, genitalia slide N 519, 3♀, genitalia slide NP 463), 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♂, genitalia slide NP393). Deposited in Department of Entomology collection, Kasetsart University, Mississippi Entomological Museum, and U.S. National Museum.

Etymology. This species is named after the late Vanee Pinkaew, mother of the senior author.

Remarks. This species was collected during the dry winter and dry summer seasons in hill evergreen forest at 980-1000 m in the same habitat as *E. munda* and *E. bicuculla*.

Unplaced *Eucoenogenes*

Eucoenogenes sp. A

Figs. 58.3, 58.4

Description. Wing pattern poorly defined.

Abdomen (Fig. 58.4): Sternum III with large patch, containing dense, short scales, becoming larger anteriorly.

Male genitalia (Fig. 58.3): Tegumen moderately wide, swollen dorsally, with group of dense setae posteriorly; uncus small and short, bifided, pointed at apex; socii large, triangular, arising from base of uncus, pendant to 1/3 of tegumen length; gnathos arising from tegumen half, moderately wide band, fused, forming a ribbon-shaped; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, large, cylindrical, with 14 deciduous cornuti; valva with sparsely setose ventrally on sacculus basally, medially with dense short spines to neck, posteriorly with group as strip of long, mixed with short, flattened setae, bifided at apex,near outer margin, dorsally with strip of short, hair-like setae along the cucullus; neck deeply incised;

cucullus small, projecting ventrally, medially enlarge with dense spiniform setae, acute at apex, with very short, acute spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♂, genitalia slide NP86), 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP371).

Remarks. This species is similar to *Eucoenogenes levatana* Kuznetsov, 1997 but *E.* sp.G has not costal fold. Specimens were collected during the winter season at 990-1,015 m in hill evergreen forest.

Eucoenogenes sp. B

Fig. 58.5

Description. Wing pattern poorly defined.

Male genitalia (Fig. 58.5): Tegumen wide, dorsally rounded with sparsely setose posteriorly, sparsely setae basal 1/3; uncus short, bilobed; socii short, arising from base of uncus, rounded at apex with moderately long setae; gnathos arising from tegumen half, sclerotized at base, apically membranous; anellus closely surrounding at base of aedeagus 1/3, aedeagus moderately long, outer surface with very short spines, cornuti 8; juxta triangular, ventrally truncated; sacculus with small group of long setae basally, small lobe ventroposteriorly, dense group of moderately long setae, flattened basoposteriorly, sparsely setose medially, with three setae, very long, wide, spatulated form dorsoposteriorly, sparsely long setae along dorsoposteriorly to middle of neck, densely short setae along basal half of neck, with sparsely short setae along neck anteromedially, valva long with deep ventral excavation; cucullus short, slightly incised medially, dorsal portion rounded at apex with dense setae, medially with short spiniform setae, mixed with long setae, ventral portion longer than, rounded at apex with dense spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 1 Oct 2002 (1♂, genitalia slide NP520).

Remarks. Specimen was collected during the rainy season at 956 m in hill evergreen forest.

Eucoenogenes sp. C

Fig. 58.6

Description. Wing pattern poorly defined.

Male genitalia (Fig. 58.6): Tegumen narrow basal half, dorsally large, with group of dense spiniform setae close to dorsoposteriorly, sclerotized line dorsoposteriorly; uncus short, bifided, acuted at apex, socii large, pendant to half of tegumen length, densely setose; gnathos arising from tegumen half, sclerotized band connected; anellus closely surrounding basal 1/3 of aedeagus; aedeagus wide, moderately long, cornuti 17; juxta triangular; valva with moderately setae, long, near base of sacculus on ventral margin; sacculus with dense spiniform setae medially on inner margin, outer margin with 11 setae, widened and flattened, pointed at apex; neck short, rather straight, curve close to cucullus; cucullus moderately wide, enlarged ventrally extending over neck, rounded at apex, with dense short, spiniform setae, short and stout spines on outer margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP117).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Eucoenogenes sp. D

Figs. 19.5, 59.1

Description. *Head*: Upper frons with long orange white scales, mixed with light brown, with short yellowish white laterally, lower frons with short, yellowish white scales; labial palpus with first segment white to orange white, second segment orange white with light brown basally, brown to dark brown spot on dorsal margin, with dark brown apically, apical segment orange white, with brown basal half; vertex orange white to pale orange posteriorly, mixed with greyish orange anteriorly, with light brown laterally.

Thorax: Pronotal collar light brown to brown; tegulae orange white apical half, with dark brown mixed with orange white basal half; mesonotum brown to dark brown anteriorly, mixed with orange white medially, transverse band, brown mixed with dark brown, posterior end light brown. Forewing (Fig. 19.5): Length 6.83 mm in male (n=1); male costal fold absent, termen slightly concave between R_5 and M_3, ground color and costal strigulae orange white, apically 1/3 with diffuse brown mixed with dark brown scales, strigulae 1 and 2 indistinct, strigulae 3-9 paired and separated by dark brown, wing base with orange white to pale orange, basal patch, dark brown or metallic dark blue when viewed at angle to light, extending from costa between near wing base and strigulae 5 to inner margin, proximal margin extending straight from costa to inner margin, distal margin extending diagonally to outer margin at R_5, angled, and extending diagonally to middle of inner margin; postmedian fascia extending diagonally from costa between strigulae 6 and 7 to outer margin at R_5, brown to dark brown, wing apex dark brown, ocellar region with dark brown between R_5 to CuA_1, distinct near outer margin, area between ocellar region and outer margin, with silvery striae from R_5 to tornus, strigulae 5-7 with silvery striae extending diagonally to outer margin, irregular dark brown striae on inner margin near tornus, between CuA_1 to inner margin, outer margin with distinct dark brown striae, broken by strigulae between R_5 and M_1. Underside light brown with yellowish grey on costa and between veins on outer margin. Hindwing light brown dorsally, ventrally ligh

brown with group of dense scales, orange white basal half, with yellowish grey apically.

Male genitalia (Fig. 59.1): Tegumen narrow basally, swollen dorsally, with group of dense setae posteriorly, moderately setae along basal 2/3; uncus small and short, bifided, pointed at apex; socii large, triangular, rounded at apex, arising from base of uncus, pendent to 1/4 of tegumen length, with moderately setose; gnathos arising from near tegumen half, fused, forming a ribbon band, enlarge medially; anellus closely surrounding basal 1/3 of aedeagus, cup–like dorsally; aedeagus moderately long, enlarged basal half, with 9 deciduous cornuti; juxta triangular, truncated ventrally; valva with moderately setae at basally to medially of sacculus, medially with strip of dense, large setae, flat, pointed at apex, with strip of larger setae, flat, pointed at apex, mixed with strip of dense, short setae along outer margin; dorsally with dense spine to cucullus, neck slightly excavation with dense spine dorsally; cucullus short, enlarge, rounded, with dense spine basal half, apical half with sprasely setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP169).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Eucoenogenes sp. E

Figs. 19.6, 88.5

Description. *Head*: Upper frons with long scales, yellowish white, lower frons with short, white to yellowish white; labial palpus with first segment white to yellowish white, second segment yellowish white mixed with dark brown basally, medially and apically with dark brown, apical segment yellowish white, with dark brown basal half; vertex yellowish white mixed with greyish yellow.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♀, genitalia slide NP120), 14°41'41"N 98°24'12"E, 6 Feb 2002 (1♀, genitalia slide NP192), 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♀, genitalia slide NP405).

Remarks. Specimens were collected during the winter season and the summer season at 745-1,040 m in montane evergreen forest.

Eucoenogenes sp. F

Figs. 19.7, 88.6

Description. *Head*: Upper frons with long, pale yellow to light yellow scales, protude over short scales laterally, dark brown, lower frons with short, yellowish white to pale yellow, with dark brown medially and laterally; labial palpus with first segment yellowish white, with dark brown dorsally, second segment yellowish white to pale yellow, becoming darker apically, with dark brown spots basally, dorsomedially, ventromedially, and apically, apical segment yellowish white, with brown basal half; vertex brown mixed with dark brown anteriorly, with yellowish white to orange white mixed with greyish orange posteriorly, with short brown to dark brown laterally.

Thorax: Pronotal collar light brown, with short dark brown anteriorly; tegulae yellowish white to orange white mixed with light brown to brown basally; mesonotum brown to dark brown, with transverse strip medially, yellowish white, posterior tufts yellowish white. Forewing (Fig. 19.7): Length 7.5 mm in female (n=1); termen slightly concaved between R_5 and M_3, ground color pale yellow mixed with greyish yellow, costal strigulae yellowish white to orange white, strigulae 1 singled, strigulae 2-9 paired and separated by dark brown, basal fascia distinct on costa between wing base and strigulae 1, subbsal fascia distinct on costa, extending between strigulae 2 and 3 to near midwing, and extending irregularly to inner margin, light brown, distal and proximal margin with dark brown; median fascia distinct on costa and on inner margin, extending diagonally from costa between strigulae 4 and 5 to R_5, angled, and

extending diagonally to inner margin, brown mixed with dark brown, diffuse at middle of wing; postmedian fascia extending diagonally from costa between strigulae 6 and 7 to outer margin at R_5, strigulae 5-9 with grey striae extending to outer margin, wing apex dark brown, interfascial spots present on inner margin, medially; ocellus region brown to dark brown, extending diagonally between R_5 to inner margin near tornus, tornus greyish yellow with two grey spots between M_3 and CuA_1 and between CuA_1 and CuA_2, outer margin with dark brown stria, broken by terminal strigulae between R_5 and M_1. Underside light brown with yellowish grey on costa and outer margin. Hindwing brown dorsally, ventrally light brown.

Female genitalia (Fig. 88.6): Sternum VII weakly sclerotized plate, with moderately dense scales laterally and anteriorly; tegumen VIII scales absent, with moderately scales laterally and on triangular lateral extension; papillae anales with dense setae, moderately long, papillose projection laterally; sterigma reduced, moderately sclerotized near anterior margin, lamella antevaginalis reduced fused with sternum VII, lamella postvaginalis absent or reduced, no scales or setae, except posteriorly with dense microtrichia and two groups of sparsely scaled sockets; ductus bursae with weakly sclerotized colliculum anteriorly, and large sclerotized plate posterior half, anterior part with sparsely small and short spines, posterior part with two armed, pointed at apex; ductus seminalis arising from 1/3 of ductus bursae posteriorly; corpus bursae with two unequal signum, blade-like, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'16"N 98°23'57"E, 22 Dec 2001 (1♀, genitalia slide NP17).

Remarks. Specimen was collected during the winter season at 1,040 m in hill evergreen forest.

Eucoenogenes sp. G

Figs. 19.8, 89.1

Description. *Head*: Upper frons with long, orange white scales, lower frons with short, yellowish white to orange white scales; labial palpus with first segment pale yellow mixed with dark brown apically, second segment orange white, with light brown mixed with dark brown basally, dorsomedially with small spot, dark brown, ventroapically and apically dark brown, apical segment with dark brown basal half, apical half orange white; vertex orange white mixed with greyish orange, with short dark brown laterally.

Thorax: Pronotal collar brown mixed with dark brown, orange white apices; tegulae brown mixed with dark brown basal half, orange white apical half, with light brown near apices; mesonotum orange white, with sparsely dark brown anteriorly, posterior end with dark brown scales. Forewing (Fig. 19.8): Length 4.75 mm in female (n=1); termen slightly concaved between R_5 and M_3, ground color orange white, with irregular striae, brown to dark brown, costal strigulae orange white, strigulae 1 and 2 indistinct, strigulae 3-4 and 7-9 paired and separated by dark brown, strigulae 5 and 6 singled; basal patch extending distinct on costa between wing base and strigulae 3 to near middle of wing, and extending diffuse to inner margin, brown mixed with dark brown; median fascia distinct on costa, rhomboidal-shaped, extending diagonally from costa between strigulae 4 and 5 to middle of wing, dark brown; postmedian fascia extending diagonally from costa between strigulae 6 and 7 to outer margin, brown; preterminal fascia extending diagonally from costa between strigulae 8 and 9 to outer margin, brown, strigulae 7 with grey striae extending diagonally to outer margin, ocellar region with diffuse scales, dark brown, between R_5 to tornus, area between ocellar region and outer margin, with indistinct grey striae, outer margin with distinct dark brown striae, broken by terminal strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and between veins on outer margin. Hindwing brown dorsally, ventrally light brown.

Female genitalia (Fig. 89.1): Sternum VII sclerotized plate with moderately dense scales throughout, posterior half with short, sparsely setae, becoming dense on posterolateral corners; tergum VIII without setae, triangular lateral extension sparsely setose; papillae anales with dense setae, papillose projection lateraly; sterigma reduced or absent, weakly sclerotized, lamella postvaginalis reduced or absent, with dense microtrichia medially, lamella antevaginalis reduced fused with sternum VII, lightly sclerotized, smooth rim, ductus bursae with antrum a wide-cup, weakly sclerotized colliculum anterior 1/3, posterior half with large sclerotized plate, two armed posteriorly, acute at apex, ductus seminalis arising from posterior 1/3 of ductus bursa; corpus bursae with two signa arising from dorsolaterally, blade-like, acuted at apex, base with shallow invagination.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 29 Jul 2002 (1♀, genitalia slide NP366).

Remarks. Specimen was collected during the rainy season at 956 m in hill evergreen forest.

Eucoenogenes sp. H

Figs. 20.1, 89.2

Description. *Head*: Lower frons yellowish white, upper frons dark brown mixed with light brown; labial palpus with first segment light brown, second segment orange white with dark brown spots basally, dorsomedially, ventrally and apically, apical segment orange white ventral half, dorsal half light brown; vertex orange grey mixed with dark brown.

Thorax: Pronotal collar light brown; tegulae light brown mixed with dark brown with greyish orange apices; mesonotum dark brown mixed with greyish orange. Forewing (Fig. 20.1): Length 6.13 mm in female (n=1): termen slightly concaved between wing apex and M_3; ground color greyish orange to brownish orange; costal strigulae orange white, strigulae1-9 paired and separated by dark brown; basal patch

present as irregular patch, dark brown intermixed with light brown extending from wing base to strigulae 3 and from costa to inner margin; median fascia extending enlarged from costa to to M stem in discal cell and extending dislocated to inner margin forming subtriangular spot on inner margin basal 1/3, dark brown mixed with light brown, distal margin of upper part extending obliquely from costa to R_5, angled and extending inwardly to M stem; postmedian fascia between strigulae 6 and 7 with dark brown line paralleled with brownish orange line extending obliquely to outer margin at R_5; wing apex dark brown; ocellus region with diffuse dark brown patch; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 89.2): Sternum VII small plate, moderately narrowed, sclerotized, concave medially, densely scaled and dense microtrichia; tergum VII with dense scales on posterior margin, tergum VIII without scales or setae, with moderately dense scales on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis reduced; lamella antevaginalis reduced to lightly sclerotized, narrowed, smooth rim, concaved medially; antrum small, sclerotized, cup-shaped; colliculum small, weakly sclerotized; ductus bursae encircled by large sclerotized plate anterior half, divided anteriorly to form two triangular projections extending into corpus bursae; ductus seminalis indistinct; corpus bursae with two signa, blade-like, rounded at apex, left signum more pointed at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002, (1♀, genitalia slide NP116).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Eucoenogenes sp. I

Fig. 89.3

Description. Wing pattern poorly defined.

Female genitalia (Fig. 89.3): Sternum VI with dense microtrichia; sternum VII with large sclerotized plate, densely scaled and sparse setae, except anteromedial area scaleless, with dense microtrichia restricted anterolaterally; tergum VII without scales or setae, with sparse setae on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; ostium bursae behind sternum VII, antrum forming a wide, sclerotized cup, colliculum small, sclerotized; ductus bursae encircled by large sclerotized plate anterior half, rotated anteriorly, with very short, sparse denticle, divided anteriorly to form two triangular projections extending into corpus bursae; ductus seminalis indistinct; corpus bursae with two signa, blade-like, acuted at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♀, genitalia slide NP115).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Eucoenogenes sp. J

Fig. 89.4

Description. Wing pattern poorly defined.

Female genitalia (Fig. 89.4): Sternum VI densely microtrichiate posterior half; sternum VII with large, sclerotized plate, densely microtrichiate throughout, except posterolaterally, sparsely setose, lateral area and posterolateral corners densely scaled, anteromedial area with group of dense scales and sparsely setose, posterior margin deeply concaved medially, sclerotized; tergum VIII without scales or setae, triangular

lateral extensions densely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis developed, forming large, subtriangular patch, sclerotized, laterally connected with posterior margin of sternum VII; densely scaled and microtrichiate, except anterior area; ostium bursae with margin, membranous, colliculum large, sclerotized; ductus bursae encircled by large sclerotized, irregular plate medially, divided posteriorly to form two subtriangular projecting into corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two, moderately large, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 11 Jan 2002 (1♀, genitalia slide NP114).

Remarks. Specimen was collected during the winter season at 1,020 m in montane evergreen forest.

Eucosma Hübner, 1823

Eucosma Hübner, 1823, Zutr. Samml. Exot. Schmett. 2: 28. Type species: *Eucosma circulana* Hübner, 1823.

Catoptria Guenée, 1845, Annls Soc. Ent. Fr. (2)3: 187. Type species: *Phalaena pupillana* Clerck, 1759. [preoccupied].

Pygolopha Lederer, 1859, Wein. Ent. Monatschr. 3: 123. Type species: *Pygolopha trinacriana* Lederer, 1859.

Calosetia Stainton, 1859, Man. Br. Butterflies Moths 2: 271. Type species: *Tortrix nigromaculana* Haworth, [1811].

Affa Walker, 1863, List Specimens Lepid. Insects Colln. Br. Mus. 27: 202. Type species: *Affa bipuctella* Walker, 1863.

Exentera Grote, 1877, Can. Ent. 9: 227. Type species: *Exentera aprilana* Grote, 1877.

Exenterella Grote, 1883, Can. Ent. 15: 23. [unnecessary replacement name for *Exentera*].

Palpocrinia Kennel, 1919, Mitt. Münch. Ent. Ges. 8: 66. Type species: *Palpocrinia ottoniana* Kennel, 1919.

Ascelodes Fletcher, 1929, Mem. Dept. Agric. India (Ent.) 11: 25. Type species: [nomen nodum].

Eucosma has been defined by the following characters; forewing smooth, termen straight or slightly concave, male with costal fold. Male genitalia characterized by simple harpes; cucullus variously shaped, sharply defined, usually with strong anal spine or spines; neck incurvation usually pronounced, neck not heavily spined or haired; sacculus without heavy spine or hair clusters; costal hook present, no rudimentary clasper. Socii developed, finger-like, short and moderate. Gnathos free to near base, weakly chitinized but not reduced. Uncus rudimentary, never more than a rounded or pointed projection at end of tegumen, basally broader than long. Aedeagus straight, short and moderate, normally stout, not needle-like; cornuti a cluster or three or more elongate spines (Heinrich, 1923). Larvae found in root collar, lower part of stems, and inflorescences of Asteraceae (Kuznetsov, 1987). The genus includes 283 species worldwide. *Eucosma* includes 6 species have been described from Southeast Asia (Brown, 2005).

"*Eucosma calligrapha*"Meyrick, 1912

Fig. 59.2

Eucosma calligrapha Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 865. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 59.2): Tegumen high, with arms moderately broad, densely scaled lateromedially, densely setose apically; uncus bifided, long, slightly curved, sparsely setose basally, apex densely setose; socii rudimentary; gnathos indistinct; anellus surrounding basal of aedeagus; aedeagus moderately long, apical half slightly narrowed, cornuti moderately dense; vesica denticulated; juxta triangular; valva moderately long, widened apically; sacculus with dense, long spiniform setae from ventromedially towards cucullus; neck indistinct; cucullus with dorsal area rotated, densely setose apically, apically with subtriangular lobe, long, slightly curved extending pointed ventrally over ventroapical area, densely setose, dorsobasally forming long, narrowed ridge, extending obliquely to sacculus basoposteriorly.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♂, genitalia slide NP113), 14°39'02"N 98°31'40"E, 22 Aug 2002 (1♂), 14°41'16"N 98°23'57"E, 22 Dec 2002 (1♂, genitalia slide NP1).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during the rainy season and the winter season at 195-1,040 m in mixed deciduous forest and hill evergreen forest. Brown (2005) placed this species in unplaced Eucosmini.

"*Eucosma mollita*" (Meyrick), 1931

Fig. 59.3

Episimus mollita Meyrick, 1931, Exotic Microlepid. 4: 147. Type locality: Java (Seneng). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 59.3): Tegumen subtriangular, with arms, narrowed, moderately dense scales laterally; uncus moderately large, subtriangular, projecting dorsally, densely setose; socii absent; gnathos arising from apical 1/3 of aedeagus, band-like, widened; caulis moderately long; anellus closely surrounding basal of aedeagus; aedeagus long, slender, slightly narrowed to apex; cornuti singled, short, spine-like; valva oblong, narrowed apically, apex rounded; sacculus with dense, moderately long setae basally, reaching to ventromedial margin, median with large group of dense, moderately long spiniform setae between basal opening and neck, dorsal sparsely setose; neck short; cucullus densely setose, ventrally with dense, long spines, ventral margin with short, sparse spines, basally with distinct, oblique edge, bearing 4-5 long spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂, genitalia slide NP670), 14°39'02"N 98°31'40"E, 25 Oct 2003 (1♂, genitalia slide NP740).

Distribution. Thailand (new record) and Java.

Remarks. Specimens were collected during the rainy season at 180-195 m in mixed deciduous forest. Brown (2005) placed this spices in unplaced Eucosmini.

Gypsonoma Meyrick, 1895

Gypsonoma Meyrick, 1895, Handbook Br. Lepid.: 481. Type species: *Tortrix dealbana* Frölich, 1828.

Gypsonoma has been defined by the following characters; forewing with light-colored median band. Venation stalked in costal half of wing. Discal cell divided by trunk of M. Uncus and gnathos absent, socii broad and large, curve outwardly. Valva broad and short, with clasper, and glabrous rim along outer margin of cucullus. Cucullus with group of series of heavily sclerotized spinescent setae, with clusters of androconia developed on tegumen near its articulation with vinculum (Kuznetsov,

1987). The genus includes 45 species worldwide and 5 species have been described from the Oriental region (Brown, 2005). Larvae develop in buds and wrapped leaves of birch and willow in form of clumps or rolls (Kuznetsov, 1987).

Gypsonoma anthracitis Meyrick, 1912

Figs. 20.2, 59.4, 89.5

Gypsonoma anthracitis Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 863. Type locality: Ceylon [Sri Lanka] (Maskeliya). Lectotype (♂): BMNH.

Description. *Head*: Lower frons yellowish white mixed with light brown laterally, upper frons yellowish white; labial palpus with first segment dark brown, second segment dark brown with yellowish white apices, apical segment yellowish white; vertex brown.

Thorax: Pronotal collar brown to dark brown; tegulae dark brown basal half, light brown mixed with dark brown apical half with each scale yellowish white apices; mesonotum dark brown mixed with light brown. Forewing (Fig. 20.2): Length 3.90 mm in male (n=7), 4.02 mm in female (n=2); male costal fold absent, termen straight; ground color yellowish white; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, brown mixed with dark brown, with distinct distal margin, dark brown; interfascia between strigulae 3 and 4 with brownish grey striae extending from costa to midwing; median fascia fused with postmedian fascia forming subtriangular patch extending from costa pointed to inner margin, brown mixed with dark brown; interfascia between strigulae 7 and 8 with striae, brown mixed with dark brown extending obliquely from costa to outer margin between M_2 and M_3; preterminal fascia extending obliquely from costa to outer margin between R_5 and M_1, brownish grey; wing apex dark brown; ocellus region with brownish grey patch between R_4 and tornus; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1. Underside light

brown with yellowish white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Male genitalia (Fig. 59.4): Tegumen with arms, narrowed, rounded apically, scaleless, uncus absent; socii subtriangular, moderately large, arising from tegumen apicolaterally, pointed dorsally, densely setose; gnathos arising from base of socii, band-like, sclerotized, between tegumen and vinculum with membranous patch, bearing dense, long scales; caulis moderately long; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, tubular-like, cornuti six, located basally; valva rather short, constricted ventromedially, with sclerotized ridge between basal opening and cucullus apically; neck indistinct; sacculus with group of short setae basally, median moderately dense setae, with small sclerotized knot on basal opening margin, dorsal densely setose; cucullus short, sparsely setose near dorsal margin, apically densely setose with group of moderately dense spines located at end of sclerotized ridge.

Female genitalia (Fig. 89.5): Sternum VII with large sclerotized plate, densely scaled, sparsely setose; tergum VIII moderately dense scales posteriorly, triangular lateral extensions with moderately dense scales; papillae anales densely setose, lateral setae with papillose bases; sterigma forming sclerotized tube, raised up, with ostium bursae on top, anterior margin smooth, posterior margin thickened, smooth rim, antrum forming small, sclerotized cup, colliculum small, moderately sclerotized; ductus bursae with large sclerotized plate medially, twisted; ductus seminalis arising from posterior end of sclerotized plate; corpus bursae with two blade-like signa, curved.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 27 Sep 2002, (3♂, genitalia slide NP485, NP490, 1♀, genitalia slide NP484), 19 Dec 2003 (1♀, genitalia slide NP699), 14°39'02"N 98°31'40"E, 29 Sep 2002 (1♂, genitalia slide NP687), 25 Oct 2002 (1♂), 22 Dec 2003 (1♂, genitalia slide NP698), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♂, genitalia slide NP672).

Distribution. Thailand (new record) and Sri Lanka.

Remarks. Specimens were collected during the rainy season and the winter season at 180-745 m in mixed deciduous forest and hill evergreen forest.

Gypsonoma infuscana Kuznetsov, 1988
Figs. 20.3, 89.6

Gypsonoma infuscana Kuznetsov, 1988, Ent. Obozr. 67: 625. Type locality: North Vietnam (Sonla Province, Naniu). Holotype (♀): ZMAS.

Description. *Head*: Lower frons white to yellowish white, upper frons white to yellowish white; labial palpus with first segment dark brown, second segment brown to dark brown, apical segment orange white; vertex brown to dark brown ; tegulae dark brown mixed with orange white.

Thorax: Pronotal collar dark brown; tegulae dark brown basal 1/3, apical 2/3 light brown with orange white apices; mesonotum dark brown mixed with orange white. Forewing (Fig. 20.3): Length 4.03 mm in female (n=6); termen rounded; ground color orange white intermixed with greyish brown, costal strigulae yellowish white, strigulae 1-8 paired and separated by dark brown, strigulae 9 singled; basal fascia incompleted present as irregular transverse line dark brown, subbasal fascia dislocated present as dark brown strip extending from costa to midwing, inner margin present as subtrianglar spot extending from inner margin to mid of discal cell, dark brown; median fascia distinct extending form costa to inner margin near tornus, dark brown becoming paler to brownish orange on inner margin; interfascia between strigulae 7 and 8 with irregular brown strip extending obliquely from costa to tornus; ocellus region with indistinct subcircular patch, light brown extending from inner margin to between M_1 and M_2 surrounding by ground color, dark brown; outer margin with irregular dark brown line broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Female genitalia (Fig. 89.6): Sternum VII sclerotized plate, densely scaled, posterior margin deeply and widely concaved, smooth margin, anterior margin moderately concaved, widened, slightly sinuated, forming membranous rounded lobe, with sclerotized edge; tergum VIII sparsely setose posteriorly, triangular lateral extensions with sparse setae; papillae anales narrowed, densely setose, lateral setae with papillose bases; lamella postvaginalis fused with lamella antevaginalis forming subquadrate plate, sclerotized, more enlarged anteriorly, posterior margin slightly concave medially, sparsely setose posterior half, with dense microtrichia restricted on anterolaterally oblique towards near posteromedially; ostium bursae opening near posterior margin of plate medially, smooth rim; colliculum rather short, narrowed, ductus bursae with large sclerotized plate posteriorly, long half of ductus bursae length, ductus seminalis arising from near middle of ductus bursae; corpus bursae with two signa, blade-like, apex pointed.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 13 Jan 2002, (1♀, genitalia slide NP149), 14°39'02"N 98°31'40"E, 30 Sep 2002 (1♀, genitalia slide NP480), 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP507), 14°40'03"N 98°36'07"E, 19 Sep 2003 (1♀, genitalia slide NP737), 18 Jan 2004 (2♀, genitalia slide NP639).

Distribution. Thailand (new record) and North Vietnam.

Remarks. Specimens were collected during the rainy season and the winter season at 180-1,020 m in mixed deciduous forest and hill evergreen forest.

Heleanna Clarke, 1976

Heleanna Clarke, 1976, Insects Micronesia 9: 11. Type species: *Rhopobota physalodes* Meyrick, 1910.

Heleanna has been defined by the following characters; small to medium-sized moth with subtriangular forewings, widest in basal 1/3 and with two small tuft of

raised scales on dorsum, and in the male always with a longitudinal, ovate depression above at the base of the cell filled with whitish, modified scales and covered by a dome of long scales, and sometimes with a costal fold covered by a dense fringe of curved, large scales. The forewings are of pale ochreous or greyish green ground color with ill-defined costal strigulae and a variable and complex pattern of dark brown irroration and marks. In the forewing R_3 is close to the long stalk of R_4 and R_5 or stalk with it. The head of *Heleanna* is characteristics in both sexes with scaling of sculpted appearance on the frons forming a large, flat, narrowly triangular area of tightly appressed scales anteriorly projecting over the labial palpi, with a medial, nose-shaped ridge in the male, and with long, porrect, sinuate labial palpi. In the male genitalia a robust, medially notched tegumen without any trace of an uncus, arm-like, strongly, sclerotized, drooping socii, naked in basal half and distally usually variably bristled and often with terminal thorn, and usually a long and extremely slender valva medially narrowed to a band-like neck, with a narrowly elliptical cucullus with 1-2 spines along the ventral margin and one on the apex. The female genitalia are characterized by a ring- or funnel-shaped sterigma posterior to sternum 7 or in an excavation of its hindmargin, a twisted and longitudinally grooved or folded ductus bursae, strongly sclerotized except for short portions at both ends, and an inverted pear-shaped corpus bursae with narrowed anterior end, with two nearly straight, horn-shaped cornuti (Clarke, 1976). The genus includes 4 species worldwide and 2 species have been described from the Oriental region (Brown, 2005). Fletcher (1932) reported that *H. physalodes* has been bred in Fiji from larvae in flower buds of *Barringtonia* (Lecythidaceae). Clarke (1976) cited *Barringtonia* and fruit of *Cordia* (Boraginaceae) as host for *physalodes* ssp. Nasu (1995, 1999) noted that larvae of *H. melanomochla* rolls young mango leaves (Anacadiaceae) in Taiwan and *H. fukugi* bores into buds and rolls young leaves of *Garcinia subelliptica* (Guttiferae) in the Ryukyus respectively.

Heleanna physalodes (Meyrick), 1910

Figs. 20.4, 60.1

Rhopobota physalodes Meyrick, 1910, Trans. Ent. Soc. Lond. 1910: 368. Type locality: Ceylon [Sri Lanka] (Chagos Islands, Isle du Coin). Lectotype (♂): BMNH.

Heleanna physalodes abundantia Clarke, 1976, Insects Micronesia 9: 15. Type locality: Micronesia (Kusaie, Pukusrik). Holotype (♂): USNM.

Heleanna physalodes elitha Clarke, 1976, Insects Micronesia 9: 19. Type locality: Micronesia (Ponape Is., Colonia). Holotype (♂): USNM.

Heleanna physalodes tricia Clarke, 1976, Insects Micronesia 9: 17. Type locality: Micronesia (Hare Is.). Holotype (♂): USNM.

Description. *Head*: Lower frons and upper frons orange white; labial palpus with first segment brown to dark brown, second segment light brown intermixed with dark brown, apical segment light brown intermixed with dark brown; vertex yellowish white to yellowish grey.

Thorax: Pronotal collar dark brown; tegulae light brown mixed with dark brown; mesonotum dark brown intermixed with orange white and light brown. Forewing (Fig. 20.4): Length 4.12 mm in male (n=2); male costal fold presented extending from wing base to midwing; termen concave between wing apex and M_3; ground color yellowish white to greyish yellow; costal strigulae yellowish white, strigulae 1-6 indistinct, strigulae 7-9 paired and separated by dark brown; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, brown mixed with dark brown, inner margin with patch, brown intermixed with dark brown extending from wing base to tornus and from inner margin to midwing, costal margin with large dark brown spot extending from costa medially to midwing at Cu and extending obliquely to wing apex, dark brown; ocellus region indistinct; outer

margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1. Underside light brown except on costal margin near wing base, dark brown, small patch between R and Cu near wing base, brownish orange, with yellowish white to yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally, brownish orange ventrally.

Male genitalia (Fig. 60.1): Tegumen moderately broad, narrowed ventrally, with moderately dense scales along outer margin, apical margin with deeply incised medially, narrowed; socii long, dilated and curved apically, moderately dense setae apically, with dense spines at apex, socii arising from apical margin of tegumen, pendant to near half of tegumen length; gnathos arising from midlength of tegumen, narrowed band-like, weakly sclerotized; anellus closely surrounding basal 1/6 of aedeagus, basal opening; aedeagus moderately long, large, slightly tapered to apex, with long, dense cornuti; sacculus with sparsely setose along ventrobasal margin, median with small group of short setae, dorsal with sparse setae, posterior with oblique, sclerotized line from sacculus towards neck dorsally; neck long and concave ventrally; cucullus short, subtriangular, apex rounded, dense spines, outer with three short spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (1♂, genitalia slide NP257), 14°33'12"N 98°34'33"E, 17 Mar 2002 (1♂, genitalia slide NP270).

Distribution. Thailand (new record), Sri Lanka, Solomon Is., India, Ceylon, Fiji and Seychelles.

Remarks. Specimens were collected during the summer season at 220-250 m in mixed deciduous forest.

Unplaced *Heleanna*

Heleanna sp. A

Figs. 20.5, 60.2

Description. *Head*: Lower frons orange white, upper frons with suppressed scales, yellowish white to orange white; labial palpus with first segment dark brown, second segment dark brown intermixed with light brown, apical segment light brown to brown; vertex light brown intermixed with yellowish grey.

Thorax: Pronotal collar brown to dark brown; tegulae brown mixed with dark brown; mesonotum dark brown mixed with orange white posteriorly. Forewing (Fig. 20.5): Length 4.75 mm in male (n=1); male costal fold presented, extending from wing base to strigulae 3, termen concave between wing apex and M_3; ground color yellowish white to orange white, costal strigulae yellowish white, strigulae 1-6 indistinct, strigulae 7-9 paired and separated by dark brown, small patch with dense, long scales near wing base between R and Cu; subbasal fascia distinct on costa 1/4 basally, extending from costa to costal fold; median fascia distinct extending from costa becoming narrowed to R, brown mixed with dark brown, two constricted dark brown dashes apical half; wing apex dark brown, inner margin with large patch extending from wing base to wing apex, and from inner margin suffused to dark brown dashes, obliquely to wing apex, light brown intermixed with dark brown; ocellus region with irregular strips, brownish grey extending from R_5 to tornus; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1, M_1 and M_2, M_3 and CuA_1. Underside light brown except costal margin near wing base, dark brown with yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally, with dense white scales on anal area, with dark brown scales on anal margin, ventrally light brown.

Male genitalia (Fig. 60.2): Tegumen moderately broad, slightly narrowed ventrally, with densely long setose along outer margin, with distinct long, single setae, on outer margin apically, apical margin moderately concave medially, widened; socii

arising from tegumen apicolaterally, pendant to near half of tegumen length, large, long, slightly concave medially, apex rounded, inner surface densely setose mixed with dense spines apically; gnathos arising from midlength of tegumen, band-like, weakly sclerotized; anellus closely surrounding basal of aedeagus, basal opening; aedeagus moderately long, slender, slightly tapered to apex, with long, dense cornuti; sacculus with moderately dense, lone setae basally to medially, ventromedially with dense setae, median with small group of short setae, dorsal with two long setae and moderately dense short towards cucullus, posterior with oblique, sclerotized line from sacculus towards neck dorsally; neck long and concave ventrally; cucullus short, apex rounded, dense spines, outer margin with sparse setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'10"N 98°36'29"E, 3 Oct 2002, (1♂, genitalia slide NP504).

Remarks. Specimen was collected during the summer season at 220 m in mixed deciduous forest.

Hermenias Meyrick, 1911

Hermenias Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 225. Type species: *Hermenias epidola* Meyrick, 1911.

Herminias Lower, 1896, Victorian Naturalist 12: 149. [nomen nudum].

Hermenias has been defined by the following characters; narrow-winged with inconspicuous markings formed by small dark longitudinal striae often confluent into an oblique dark streak from base to apex. The genus has long, narrow and porrect labial palpi and the males are characterized by usually conspicuously ciliate, basally notched antennae and a dark hair pencil in the anal fold of the hindwing. The long costal fold reaching to 2/3 of the wing. The uncus is always single, never bipartile or apically cleft, socii are rigid and dorsoapically covered with dense, fine, fur-like hairs. The female genitalia with the bursa wall covered with long sharp spinules are

typically. Absence of signa and a characteristic sterigma formed by a projecting, rounded median lobe from the hindmargin of sternum 7, ductus bursae with a split colliculum below the ostium and a sclerotized area with some spinules between the origin of the ductus seminalis and the bursa neck (Diakonoff, 1953). The genus includes 9 species worldwide. *Hermenias* includes 5 species have been described from Southeast Asia (Brown, 2005).

Hermenias pachnitis Meyrick, 1912

Figs. 20.6, 60.3

Hermenias pachnitis Meyrick, 1912, J. Bombay Nat. Hist. Soc. 22: 852. Type locality: Ceylon [Sri Lanak] (Maskeliya). Lectotype (♂): BMNH.

Description. *Head*: Antenna with notch between flagellum 10-11; lower frons white, upper frons yellowish white; labial palpus with first segment white mixed with dark brown dorsally, second segment white with dark brown patch apically, apical segment white; vertex dark brown intermixed with white to orange white.

Thorax: Prorotal collar dark brown; tegulae dark brown intermixed with white basal 2/3, apical 1/3 light brown; mesonotum brown to dark brown with transverse white strips. Forewing (Fig. 20.6): Length 5.72 mm in male (n=2); male costal fold absent, termen slightly concave between wing apex and M_3, ground color white with diffuse dark brown spots, costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin broken by diffuse white spots; inner margin with patch, brown to dark brown in area between inner margin and 1A + 2A; median fascia incompleted extending oblique irregularly from costa to tornus, dark brown, medially present as large spot in discal cell posterior end; postmedian fascia distinct on costa extending from costa to R_2 with dark brown narrow line extending obliquely to outer margin, interfascia between strigulae 7 and 8 with dark brown narrow line extending obliquely to wing apex, wing apex dark brown; ocellus region with large patch, dark brown extending from R_5 to CuA1; outer margin with distinct dark brown line broken

by white strigulae between R_5 and M_1. Underside light brown on costa with white spot on outer margin between R_5 and M_1. Hindwing brown dorsally, anal margin triangular lobe with long, narrow dark brown scale terminally, and forming small sclerotized groove containing white hair pencils, ventral light brown.

Male genitalia (Fig. 60.3): Tegumen subrectangular, moderately broad, narrowed ventrally, with moderately dense scales along outer margin; uncus short, bifurcated, basal wide, subrectangular, slightly concave apicomedially, dense microtrichia, apicolateral corners with pointed process, moderately long, sclerotized, dense microtrichia basal half; socii arising from base of uncus, subcircular lobe, slightly flattened, slightly concave on anterior surface, moderately dense, long setae, outer margin sparse setae; gnathos arising from midlength of tegumen, membranous; anellus cup-like, surrounding basal 1/4 of aedeagus, dorsal extending to apical 1/4; aedeagus moderately long, with group of dense denticles on inner margin apically; juxta triangular; sacculus with small group of moderately long setae basally, ventrobasally with rounded lobe, with large group of different sizes of spiniform setae, dorsal sparse setae; neck moderately long, narrowed, curved, sparsely setose on dorsal margin; cucullus rather short, rounded at apex, ventroapically with subtriangular large lobe, dense spines apical half, with distinct single short, strongly spine apically, outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP433), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP681).

Distribution. Thailand and Ceylon.

Remarks. Specimens were collected during the winter season at 255-990 m in dry evergreen forest and hill evergreen forest.

Herpystis Meyrick, 1911

Herpystis Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 244. Type species: *Herpystis avida* Meyrick, 1911.

Herpystis has been defined by the following characters; small-sized, very narrow-winged, brownish moths with variable wing pattern but always with dark costal strigulae in basal half, a dark blotch or oblique band near middle of the costa, a series of paired white strigulae in apical half, a prominent, subapical dark strigulae on the costa usually linked with a series of parallel dark, longitudinal dashes in the ocelloid patch which are preceded and followed by transverse, silver-grey marks, always with a white line along the termen and usually with a short, longitudinal, blackish streak in the middle of the wing beyond the cell. The genus has sinuate, moderately long, slender to medially strongly widened labial palpi and an unusual wing venation with all veins separate in the forewing. The female frenulum has two bristles only. The male genitalia are characterized by a robust, simple tegumen with elongate, very flimsly socii, a wide vinculum, usually slender valvae without a basal process but with a large spine on the ventral margin in apical half and with the ventral margin often with a cluster of spines near its middle and with a variably developed emargination distally and sometimes also proximally to the spine cluster. The female genitalia are unique with the ostium at the base of the medially divided sternum 7, rod-like sclerotization along the anterior margin of sternum 7 and the hind margin of sternum 6, the sterigma a spinulose band or two spinulose humps below the ostium and a long funnel, a short colliculum of thickened membrane, the bulla seminalis directly joined to the entrance of the corpus bursae with a short, wide connection, and the two horn-shaped signa (Diakonoff, 1969 b). The genus includes 12 species worldwide. *Herpystis* includes 5 species have been described from Southeast Asia (Brown, 2005).

Herpystis mica Kuznetsov, 1988

Fig. 60.4

Herpystis mica Kuznetsov, 1988, Ent. Obozr. 67: 630. Type locality: North Vietnam (Vinhphu Province, Tamdao). Holotype (♂): ZMAS.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 60.4): Tegumen with arms, broaded, moderately dense scales laterally and apicolaterally; uncus absent; socii ill-defined patch, moderately dense setae; gnathos arising from midlength of tegumen; caulis widened, moderately long; anellus closely basal of aedeagus; aedeagus long, basal 1/3 widened, apical 2/3 slightly narrowed to apex; cornuti dense, long, sinuated medially; sacculus with row of sparse setae, extending along near basal opening margin from basally to neck; neck rather short, deeply concaved ventrally, sparsely setose and short spined; cucullus long, dilated apically, with dense, long spiniform setae, outer margin with distinct one spine, moderately long, curved, ventrobasally with subtriangular lobe, dense spiniform setae and group of short spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP730).

Distribution. Thailand (new record) and North Vietnam.

Remarks. Specimen was collected during the summer season at 935 m in hill evergreen forest.

Unplaced *Herpystis*

Herpystis sp. A

Figs. 20.7, 90.1

Description. *Head*: Lower frons yellowish white, upper frons light brown to brown, labial palpus with first segment brownish orange, second segment yellowish grey mixed with dark brown medially and apically, apical segment yellowish grey; vertex brownish orange to light brown.

Thorax: Pronotal collar brown; tegulae brownish orange mixed with dark brown; mesonotum yellowish white mixed with brown and dark brown. Forewing (Fig. 20.7): Length 4.24 mm in female (n=6); termen slightly concave between wing apex and M_3; ground color yellowish white intermixed with yellowish grey; costal strigulae white, strigulae 1-9 paired and separated by dark brown except strigulae 5 and 6 singled; basal patch present as irregular transverse line extending from costa to inner margin, dark brown; median fascia incompleted present as large dark brown spot between costa and R_2 and extending as irregular spots to inner margin; postmedian fascia present as dark brown spot on costa; preterminal fascia extending obliquely from costa to R_5; pretornal subtriangular spot, grey extending from inner margin to M_1, wing apically with dark brown strip extending from wing apex to tornus, curved medially, outer margin with yellowish white strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3, M_3 and CuA_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Female genitalia (Fig. 90.1): Sternum VI with posterior margin sclerotized, concaved medially, posterolaterally with small lobe, weakly sclerotized, constricted beneath sternum VI; sternum VII forming small sclerotized plate, densely scaled and microtrichiate, posterior margin deeply concaved medially towards near anterior margin, anterior area with patch of dense denticulate; tergum VIII without scales or setae, triangular lateral extensions densely scales and sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced; lamella postvaginalis forming small patch of dense microtrichia; ostium bursae widened, rounded, opening on sternum VII, smooth rim; antrum forming sclerotized cup, widened posteriorly; ductus bursae with large sclerotized plate; ductus seminalis arising from distal end of sclerotized plate, forming large accessory corpus bursae; corpus bursae small with two signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (3♀, genitalia slide NP534, NP722, NP732), 14°40'03"N 98°36'07"E, 28 Jun 2003 (2♀, genitalia slide NP641, NP741), 14°41'43"N 98°27'34"E, 19 Jan 2004 (1♀, genitalia slide NP742).

Remarks. Specimens were collected during the summer season and the winter season at 180-745 m in mixed deciduous forest and hill evergreen forest.

Herpystis sp. B

Fig. 90.2

Description. Wing pattern poorly defined.

Female genitalia (Fig. 90.2): Sternum VII with moderately large sclerotized plate, densely scaled and microtrichiate, posterior margin concaved medially forming two large lobes; tergum VIII without scales or setae, triangular lateral extensions densely scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming moderately large patch of microtrichia; ostium bursae covered by sternum VII; ductus bursae moderately long, with rather small, sclerotized plate posteriorly, encircled; two corpus bursae, unequal, first corpus bursae smaller, with two small, spine-like signa, secondary corpus bursae larger, with inception of ductus seminalis medially.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP724).

Remarks. Specimen was collected during the summer season at 745 m in hill evergreen forest.

Herpystis sp. C

Figs. 20.8, 61.1

Description. *Head*: Lower frons white to yellowish white, upper frons yellowish grey; labial palpus with first segment light brown, second segment light brown mixed with brown, apical segment yellowish white; vertex brownish grey mixed with yellowish grey.

Thorax: Pronotal collar light brown to brown; tegulae greyish orange intermixed with orange white, with dark brown basally; mesonotum yellowish white mixed with light brown anteriorly and dark brown posteriorly. Forewing (Fig. 20.8): Length 3.81 mm in male (n=4); male costal fold absent; termen slightly concave between wing apex and M_3; ground color yellowish white; costal strigulae yellowish white, strigulae 1 and 2 indistinct, strigulae 3-4 and 7-9 paired and separated by dark brown, strigulae 5 and 6 singled; basal fascia indistinct; subbasal fascia distinct extending obliquely from costa to inner margin, dark brown, distal margin extending obliquely from costa to Cu vein, angled and extending obliquely to inner margin; median fascia, dark brown, extending oblique distinctly from costa to R vein and extending as diffuse to inner margin, broken by ground color; postmedian fascia extending obliquely from costa to R vein, dark brown mixed with brownish orange; preterminal fascia extending obliquely from costa to R_5, dark brown mixed with brownish orange; wing apex dark brown; ocellus region with irregular dark brown patch between R_5 and tornus; outer margin with small yellowish white terminal strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Male genitalia (Fig. 61.1): Tegumen subrectangular, with arms, moderately broad, moderately dense scales basally, apex with dense scales and sparsely setose; uncus reduced; socii moderately large, subtriangular lobes, arising from tegumen dorsoapically, pendant to half of tegumen length, densely setose; gnathos arising from midlength of tegumen, band-like, moderately widened; anellus closely surrounding

over basal half of aedeagus; aedeagus large, moderately long, widened, slightly narrowed to apex, with group of denticulate dorsoapically; cornuti ten, long 2/3 of aedeagus length; sacculus sparsely setose along ventral margin, median with short, dense spines on basal opening margin reaching to cucullus ventrobasally; neck indistinct; cucullus long, clavate, dilated apically, apex rounded, dense spiniform setae, ventral margin with two distinct spines, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (4♂, genitalia slide NP509, NP523, NP524, NP723).

Remarks. Specimens were collected during the summer season at 935 m in hill evergreen forest.

Megaherpystis Diakonoff, 1969

Megaherpystis Diakonoff, 1969, Tijdschr. Ent. 112: 97. Type species: *Megaherpystis eusema* Diakonoff, 1969.

Megaherpystis has been defined by the following characters; forewing without costal fold, suboval-truncate, costa curved throughout, apex pointed, termen strongly sinuate. Antenna in male slightly thickened, minutely subserrulate. Labial palpus moderately long, subascending, moderately sinuate, with roughish scales towards apex, terminal segment moderate, subobtuse, almost spindle-shaped. Hindtibia in male with smoothly appressed scales on the inner side, edge with appressed hair-scales above, with a long roughish fringe of scales below. The male genitalia are characterized by tegumen, robust and rather broad, with a sclerotized top. Uncus small, a semiporrect inverted-cordiform plate, ventral edge of tegumen concave, then extended in keel-like prominence, at base of socii. Socii large and broad, median edge concave and bristly. Gnathos indicated by a pending lobe at each side. Valva moderate, strongly constricted in middle. Sacculus moderate, with a marginal bristly, cucullus densely bristled, with a marginal of strong thorns (Diakonoff, 1969 b). The genus includes 3

species worldwide. *Megaherpystis* includes 1 spcies from the Oriental region (Brown, 2005).

Megaherpystis melanoneura (Meyrick), 1912

Figs. 21.1, 61.2

Eucosma melanoneura Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 866. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. *Head*: Lower frons yellowish white, upper frons dark brown mixed with greyish orange beneath; labial palpus with first segment brownish grey, second segment brownish grey ventral half mixed with orange dorsal half, with brown narrow strip extending from dorsomedially to ventroapically, apical segment light brown; vertex dark brown mixed with greyish orange.

Thorax: Pronotal collar greyish orange, tegulae greyish orange with dark brown spot basomedially; mesonotum dark brown mixed with greyish orange. Forewing (Fig. 21.1): Length 6.24 mm in male (n=3); male costa fold absent; termen slightly concave between wing apex and M_3; ground color greyish orange mixed with diffuse light brown to dark brown spots; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown, fascia indistinct suffused with ground color except on inner margin in subbasal patch area with patch basal 1/3 extending from inner margin to Cu vein, with pretornal patch, brown mixed with dark brown extending from costa to CuA_2; ocellus region with sinuate dark brown narrow line extending from R_5 to tornus; postmedian fascia with irregular dark brown line extending obliquely from costa to outer margin at M_2; preterminal fascia extending obliquely from costa to outer margin between R_5 and M_1; wing apex brown; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside yellowish grey mixed with dark brown on R and Cu vein area, with yellowish grey spots on costa and between veins. Hindwing subhyaline with dark brown scales covered longitudinal veins dorsally, ventral yellowish grey.

Male genitalia (Fig. 61.2): Tegumen moderately broad, densely scaled along outer margin; uncus moderately long, hooked, widened, bilobed, rounded at apex, sparsely setose basoposteriorly; socii arising from base of uncus, rather short, tapered apically, rounded at apex, moderately dense setae; posterior margin of tegumen protuded to form gnathos near half of tegumen length, sclerotized; anellus closely basal of aedeagus; aedeagus moderately long, with long dense cornuti; sacculus with group of dense, moderately long setae basally, ventrobasal margin with small subtriangular lobe, with 5 setae, very long, posterior surface with dense microtrichia ventrobasally, between basal opening and ventromedial margin with large group of dense, moderately long setae, ventromedial margin with row of dense long setae, with large group of dense short spines between basal opening and neck, dorsal with moderately dense setae; neck moderately long, sparsely setose on dorsal margin and sparsely short spiniform setae ventrally; cucullus short, enlarged medially, apically rounded, dense long spiniform setae, with short spines along apical margin, ventrobasal margin with dense moderately long spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♂, genitalia slide NP501), 14°41'43"N 97°37'34"E, 22 Oct 2003 (1♂, genitalia slide NP578), 14°40'03"N 98°36'07"E, 23 Oct 2003 (1♂).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during the rainy season and the winter season at 990-1,015 m in hill evergreen forest.

Mesocallyntera Diakonoff, 1959

Mesocallyntera Diakonoff, 1959, Zool. Verh. Leiden 43: 47. Type species: *Mesocallyntera squamosa* Diakonoff, 1959.

Mesocallyntera has been defined by the following characters; forewing covered on both sides with slightly raised scales, especially loose and dense along veins on underside, base of scales semihyaline, making the wing appear semitransparent. Antenna short-ciliate in male. Labial palpus moderate or rather long, longer in female, obliquely ascending. Mesopleura with a long pencil of hair directed caudad in both sexes, median femur in two sexes with a small subapical tuft below, median tibia strongly expanded with roughly appressed dense scales, tarsus slender. Hindtibia in both sexes dilated with bristly hairs, and with a long pencil of hairs. Hindwing vein 2A at base with a strong pencil of hairs, then with a pectin of long hairs along its length, hindwing similarly scaled as forewing but scales smaller and hardly raised. The male genitalia, tegumen a slender, dilated into oval plates at sides towards base, uncus absent, socii a moderate porrect knob. Valva slender, sinuate, narrowed posteriorly, cucullus furcated, with strong curved black bristles, caulis long. Aedeagus slender, strongly curved, sclerotized, with long cornuti. The female genitalia are characterized by anal lobe with single series of short sclerotized papillae. Ninth segment elongate, lamella antevaginalis obsolete, lamella postvaginalis a membranous, semicircular aciculate sclerite. Colliculum, an irregularly shaped spheroid, ductus bursae short and wide, corpus bursae short without signa (Diakonoff, 1959b). The genus includes 3 species worldwide. *Mesocallyntera* includes 2 species have been described from Southeast Asia (Brown, 2005).

Mesocallyntera squamosa Diakonoff, 1959

Figs. 21.2, 90.3

Mesocallyntera squamosa Diakonoff, 1959, Zool. Verh. Leiden 43: 49. Type locality: Indonesia (West Central Celebes, Palu District, Lindu Palu). Holotype (♂): BMNH.

Mesocallyntera squamosa loricata Diakonoff, 1959, Zool. Verh. Leiden 43: 50. Type locality: British New Guinea (Hydrographer Mountains). Holotype (♂): BMNH. [subspecies of *squamosa*].

Description. *Head*: Lower frons dark brown, upper frons dark brown; labial palpus with first segment brownish orange mixed with dark brown spots basally, with dark brown apically, apical segment brown mixed with dark brown; vertex dark brown with some scales orange white apices.

Thorax: Pronotal collar dark brown with yellowish white apices; tegulae brown to dark brown basal half, apical half light brown to brown; mesonotum dark brown mixed with light brown; posterior scales tuft brown. Forewing (Fig. 21.2): Length 9.45 mm in female (n=1); termen rounded; ground color greyish brown, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown; basal fascia incompleted extending from wing base to strigulae 1 and from costa to inner margin, dark brown mixed with brown; subbasal fascia extending irregulary from costa to inner margin, dark brown, median fascia with distinct subtriangular patch extending from strigulae 4 to strigulae 7 tapered to Cu vein and extending as narrow strip to inner margin; postmedian fascia distinct extending obliquely from costa to R_4, separated, one strip extending to outer margin at CuA_1, the other extending to inner margin near tornus, dark brown; preterminal fascia extending obliquely from costa to outer margin at R_5, ocellus region with brown patch extending from R_5 to tornus; outer margin with distinct brown line broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown. Midtibia with dense scales tuft, dark brown.

Female genitalia (Fig. 90.3): Sternum VII slightly sclerotized plate, densely scaled and sparsely setose, concave medially; tergum VIII dense microtrichia, with moderately dense scales and sparsely setose on posterior margin and on triangular lateral extensions; papillae aneles widened, densely setose, lateral setae with papillose bases, with row of distinct six papillose bases on each side of papillae anales surface, extending obliquely; lamella antevaginalis reduced; lamella postvaginalis forming transverse finely wrinkled plate; ostiun bursae with smooth rim; colliculum forming large, spherical pouch, slightly sclerotized; ductus seminalis arising from near middle of ductus bursae; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'31"N 98°24'27E, 13 May 2002 (1♀, genitalia slide NP428).

Distribution. Thailand, West Celebes and British New Guinea.

Remarks. Specimen was collected during the summer season at 954 m in hill evergreen forest.

Noduliferola Kuznetsov, 1973

Noduliferola Kuznetsov, 1973, Ent. Obozr. 52: 685. Type species: *Noduliferola abstrusa* Kuznetsov, 1973.

Duessa Clarke, 1976, Insects Micronesia 9: 26. Type species: *Duessa pleurogamma* Clarke, 1976.

Microclita Diakonoff, 1984, Ent. Basil. 9: 393. Type species: *Microclita niphada* Diakonoff, 1984.

Noduliferala has been defined by the following characters; large, porrect, sinuate labial palpi and narrow, subrectangular forewings with a produced apex and a narrow costal fold to the middle of the wing in the male. The wing pattern always includes a blackish spot in apex and often portion of a broad, dark, curved band from middle of costa to apex. In the forewing chorda and M-stem are absent, R_4 and R_5 are stalked and their stalk is closely approximated to R_3 at base. The highly modified male tergum 8 ending in a conspicuously enlarged, triangular, pointed lobe. The male genitalia are quite unique, with a shield-shaped apex to the tegumen and the distally membranous and complex valva. The female genitalia with a strongly sclerotized, broadly ring-shaped sterigma, fitted into a deep, semicircular emargination in the hindmargin of sternum 7 and with a spinulose hump in the lamella postvaginalis. The genus includes 9 species worldwide. *Noduliferola* includes 6 species have been described from Southeast Asia (Brown, 2005).

Noduliferola niphada (Diakonoff), 1984

Fig. 61.3

Microclita niphada Diakonoff, 1984, Ent. Basil. 9: 394. Type locality: Indonesia (Central Sumba, Lindi Watju). Holotype (♂): NHBM.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 61.3): Tegumen subtriangular, with arms, moderately broaded, scaleless; uncus absent; socii forming patch-shaped, densely setose, located near midlength of tegumen; gnathos arising from basal 1/3 of tegumen, completed band-like, sclerotized medially; membrane between tegumen and valva with group of long, dense, narrowed scales; anellus cup-like, surrounding basal 1/3 of aedeagus; aedeagus short; cornuti dense; juxta triangular; sacculus with large group of dense setae basally, median with short setae between basal opening and small subtriangular lobe on ventromedial margin, dorsal sparsely setose; neck short, concaved ventrally, with ventral margin sclerotized, sparsely setose; cucullus distinct, forming large oval-shaped, dorsal margin with row of moderately dense setae medially, posterior surface with moderately dense scale sockets; apex with posterior margin covered posterior surface, ventrobasally with group of moderately long, dense spines, and single, short spine on margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 16 Sep 2002 (1♂, genitalia slide NP679), 14°41'43"N 98°27'34"E, 19 Feb2004 (1♂, genitalia slide NP718).

Distribution. Thailand (new record) and Indonesia.

Remarks. Specimens were collected during the rainy season and the winter season at 195-745 m in mixed deciduous forest and hill evergreen forest.

Pelochrista Lederer, 1859

Pelochrista Lederer, 1859, Wien. Ent. Monatschr. 3: 331. Type species: *Paedisca mancipiana* Mann, 1855.

Callimosema Clemens, 1865, Proc. Ent. Soc. Philad. 5: 141. Type species: *Callimosema scintillana* Clemens, 1865.

Eucosmoides Obraztsov, 1946, Z. Wien, Ent. Ges. 30: 38. Type species: *Grapholita decolorana* Freyers, 1842.

Pseudeucosma Obraztsov, 1946, Z. Wien. Ent. Ges. 30: 37, Type species: *Tortrix caecimaculana* Hübner, [1796-1799].

Pelochrista has been defined by the following characters; discal cell in forewings separated by trunks of R, R_4 and R_5. Length of M_3 and CuA_1 in hindwing often greater than length of free branches. Forewing in male always with costal fold. Uncus rudimentary, socii long, directed outwardly. Valva with pulvinus, sometimes modified into clasper. Usually valva with well-defined neck; valva tapers more towards distal part of apex of sacculus. Cucullus with isolated spine on ventral lobe or with a few large spinescent setae along outer margin. Neck of valva without setose cover (Kuznetsov, 1987). The genus includes 83 species worldwide. *Pelochrista* has not been described from the Oriental region (Brown, 2005). Larva found in root collar and lower part of stem of plants of Asteraceae (Kuznetsov, 1987).

Pelochrista pollinaria Diakonoff, 1971

Fig. 61.4

Pelochrista pollinaria Diakonoff, 1971, Veröff. Zool. Staatsamml. München 15: 181. Type locality: India/ Pakistan (NW Karakorum, Gilgit, Banidas). Holotype (♂): ZSM.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 61.4): Tegumen with arms, moderately broad, moderately dense scales laterally; uncus reduced forming subtriangular lobe, apex rounded, sparsely setose; socii large, subtriangular, pendant from base of uncus to near midlength of tegumen, densely setose; gnathos arising from near midlength of tegumen, band-like, widened medially; caulis moderately long; anellus closely surrounding basal 1/5 of aedeagus; aedeagus moderately long, basal 1/3 widened, abruptly narrowed apical 2/3; cornuti dense, long 2/3 of aedeagus length; juxta triangular; sacculus subrectangular, with dense, long setae between basally and ventromedially, and ventral margin, median with small subtriangular lobe on basal opening margin, moderately dense, short setae, dorsal sparsely setose towards neck; neck moderately long, concaved medially, sparsely setose on margins; cucullus rather small, with long, dense spines, dorsoapically rounded, with dense setae on margin, ventroapically angled, with distinct single spine, moderately long, ventral margin with distinct 2-3 spines, moderately long, pointed ventrally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'07"N 98°21'56"E, 16 May 2002 (1♂, genitalia slide NP727).

Distribution. Thailand (new record) and Russia.

Remarks. Specimen was collected during the summer season at 980 m in hill evergreen forest.

Peridaedala Meyrick, 1925

Peridaedala Meyrick, 1925, Exotic Microlepid. 3: 139. Type species: *Peridaedala hierograpta* Meyrick, 1925.

Peridaedala has been defined by the following characters; head with long hairs, very dense and rough. Antenna with scape rather long, smooth, stout in male,

rather slender in female, flagellum in male distinctly thickened, gradually tapering towards apex, basal sixth strongly flattened dorsoventrally and dilated, beyond base forming a rounded lobe, and is followed by a deep notch, flagellum rather abruptly narrowed beyond this. Lapial palpus long, median segment compressed laterally, ascending, dilated with dense scales, terminal segment long, smooth, slender, cylindrical and porrect. Abdomen in some species with lateral pencils of long hairs on sixth and seventh segments. Forewing with a costal; fold to 2/3 without raised scale-tufts. Hindwing in male sometimes of modified shape, with a tornal lobe and thick scaling in tornus on the underside. The male genitalia are characterized by strong tegumen, uncus short, upper edge curved downwardly, indent in middle, sometimes forming two short median lobes. Socii rigid, subpending, narrowed, top curved medially. Gnathos very strong, being a heavily rising transverse plate, deeply incised in middle with two horn-like projections above. Valva narrow, more or less constricted beyond middle; cucullus transversely dilated, bristled, sometimes dentate along edge; sacculus with an apical blunt projection. Aedeagus short, straight; ostium cup-shaped. Ductus bursae moderate or short, represented by a complicated sclerotized structure, bursa copulatrix large, with two large nail-shaped signa (Diakonoff, 1953). The genus includes 20 species worldwide. *Peridaedala* includes 15 species have been describd from Southeast Asia (Brown, 2005).

Unplaced *Peridaedala*

Peridaedala sp. A

Figs. 21.3, 90.4

Description. *Head*: Lower frons yellowish white, upper frons brown mixed with yellowish grey; labial palpus with first segment yellowish grey, second segment light brown, apical segment brown; vertex pale yellow.

Thorax: Pronotal collar brown; tegulae brown to dark brown; mesonotum pale orange. Forewing (Fig. 21.3): Length 4.04 mm in female (n=1); termen concave between wing apex and CuA_1; ground color yellowish white to orange white; costal

strigulae yellowish white, strigulae 1-4 and 8 indistinct, strigulae 5-7 and 9 paired and separated by dark brown, costal marginal half with large patch, brown mixed with dark brown, extending from wing base to end of discal cell, inner marginal half with irregular transverse light brown line between wing base to near tornus; basal and subbasal fascia indistinct; median fascia distinct on costa extending obliquely from costa to R_1, strigulae 5 and 6 with brownish grey striae extending obliquely from costa to R_4, interfascia between strigulae 5 and 6 with greyish orange striae extending obliquely from costa to R_4; postmedian fascia present as distinct dark brown spot on costa, area between strigulae 7 and 9 on costa with dark brown patch, wing apex brownish orange; ocellus region with two dark brown spots between M_2 and CuA_1 surrounding with greyish orange scales, with transverse dark brown line beyond spots extending from M_1 to between CuA_1 and CuA_2, with irregular brown strip between R_5 and tornus. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing light brown to brown dorsally, light brown ventrally.

Female genitalia (Fig. 90.4): Sternum VII with moderately large, weakly sclerotized plate, densely scaled, margins with sclerotized ridge, widened, wrinkled, except anterior margin, posterior margin forming sclerotized rounded lobe, smooth; tergum VIII and triangular lateral extensions sparsely setose; papillae anales narrowed, moderately dense setae, without papillose bases; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae covered by sternum VII; ductus bursae with sclerotized plate, irregular, located near middle of ductus bursae, long 1/3 of ductus bursae length; ductus seminalis arising from near anterior end of sclerotized plate; corpus bursae with two blade-like signa, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♀, genitalia slide NP445).

Remarks. Specimen was collected during the summer season at 922 m in hill evergreen forest.

Rhopobota Lederer, 1859

Rhopobota Lederer, 1859, Wien. Ent. Monatschr. 3: 306. Type species: *Tortrix naevana* Hübner, [1814-1817].

Erinaea Meyrick, 1907, J. Bombay Nat. Hist. Soc. 18: 141. Type species: *Erinaea chlorantha* Meyrick, 1907.

Kundrya Heinrich, 1923, Bull. U.S. Nat. Mus. 123: 192. Type species: *Kundrya finitimana* Heinrich, 1923.

Norma Heinrich, 1923, Bull. U.S. Nat. Mus. 123: 191. Type species: *Epinotia dietziana* Kearfott, 1907.

Eumarissa Clarke, 1976, Insects Micronesia 9: 32. Type species: *Eumarissa leucognoma* Clarke, 1976.

Rhopobota has been defined by the following characters; small to medium-sized moth with rather narrow, subovate forewings, with a projecting apex containing a blackish spot, contrasting and well-developed costal strigulae. The wing pattern usually characteristic, with paler dorsal and terminal area and an oblique dark band from apex to near middle of dorsum where it is angled and runs to the base of the wing, often extended to the basal part of costa. The hindwing in the male usually has smaller, modified scales in central part and below a band of modified, blackish scales along the anterior margin of the cell is diagnostic for the genus. In the male genitalia the widely spaced, lightly sclerotized uncus process, the very long band-like socii with densely hairy apical lobes which are either medially paired or bent upwardly on long stalks and closely associated with the gnathos, a slender valva with a widened cucullus without any neck but nearly always with conspicuous finger- to band-shaped process distally from ventral margin of basal excavation, and with a modified, upwardly pointing costal process are diagnostic for the genus. In the female genitalia the sterigma is well-sclerotized and diverse, either fused with sternum 7 or fitted into a

deep emargination in its hindmargin. The ductus bursae with a folded sclerite below the ostium and a bipartile sclerite at the entrance to the corpus bursae, consisting of two longitudinal sclerotized bands on either side reaching deep into corpus bursa and in the bursa neck connected by a transverse, arch-shaped sclerite are diagnostic for the genus. Together with two curved, flattened, horn-shaped signa of usually unequal size, sometimes reduced to one signum (Kuznetsov, 1987). The genus includes 40 species worldwide. *Rhopobota* includes 10 species have been described from Southeast Asia (Brown, 2005, Razowski, 1999). *Rhopobota* larvae are leaf rollers on a wide range of plants, with several species known to be polyphagous. Brown (1983) and Nasu (1999) provided several genera of the Ericaceae and *Ilex* spp. in the Aquifoliaceae, and also Berberidaceae, Cornaceae, Fagaceae, Rasoceae, Rhamnaceae and Dipsacaceae.

Rhopobota antecellana Kuznetsov, 1988

Figs. 21.4, 62.1

Rhopobota antecellana Kuznetsov, 1988, Ent. Obozr. 67: 627. Type locality: North Vietnam (Vinhphu Province, Tamdao). Holotype (♂): ZMAS.

Description. *Head*: Lower frons yellowish white, upper frons light brown to brown; labial palpus with first segment light brown, second segment light brown with brown ventrally and dark brown dorsoapically, apical segment greyish orange; vertex light brown to brown.

Thorax: Pronotal collar greyish orange; tegulae brownish orange mixed with light brown to dark brown; mesonotum dark brown intermixed with brownish grey. Forewing (Fig. 21.4): Length 5.11 mm in male (n=2); male costal fold absent; termen slightly concave between R_5 and M_3; ground color orange white intermixed with orange grey; costal strigulae white, strigulae 1-9 paired and separated by dark brown, basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin greyish to dark brown, becoming darker on distal area; median fascia indistinct extending obliquely from costa to inner margin near tornus, distal margin

extending obliquely from costal to chorda and curved to R_4, pointed and extending to inner margin, light brown to brown intermixed with orange white, distal margin dark brown upper part, strigulae 5-9 with grey to brownish grey striae extending confluence at R_5, wing apex brown; ocellus region with patch orange white to greyish orange between R_5 and tornus with diffuse dark brown spots between R_5 and M; outer margin with white strigulae between R_5 and M_1. Underside brown to dark brown mixed with orange white between inner margin and CuA_2, with yellowish grey spots on costa and outer margin between veins. Hindwing brown to dark brown becoming paler to wing base, anal margin forming sclerotrized groove contain orange white hair pencil length basal times fourth, ventral light brown.

Male genitalia (Fig. 62.1): Tegumen high, moderately broad, scaleless, apically forming subtriangular lobe, apex rounded; uncus absent; socii arising from base of subtriangular lobe, pendant to near half of tegumen, large, rounded at apex, dense scales, with long setae on outer surface; gnathos arising from near basal 1/3 of tegumen, narrowed band-like, disconnected medially, strongly sclerotized basally; anellus surrounding over basal 1/3 of aedeagus; aedeagus long, curved medially, with long, dense cornuti medially; vesica with two short spines near apex; juxta triangular, rounded ventrally; valva deeply incised ventrally forming neck; sacculus with moderately dense setae along ventral margin, ventromedial round lobe bearing moderately long, narrowed process, tube-like, with moderately dense, short setae at apex, dorsoposteriorly with group of moderately long, flat, dense scales and very long scales; neck short; cucullus rather short, curved upwardly, tapered apically, rounded at apex, dense spines mixed with setae, dorsal margin with group of long, flattened scales, hooked apically, outer margin with sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'04"N 98°38'52"E, 22 Apr 2002 (1♂, genitalia slide NP352), 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP430).

Distribution. Thailand (new record) and North Vietnam.

Remarks. Specimens were collected during the summer season at 250-745 m in mixed deciduous forest and hill evergreen forest.

Rhopobota symbolias (Meyrick), 1912

Fig. 62.2

Acroclita symbolias Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 858. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 62.2): Tegumen moderately broad, rounded apically, slightly narrowed ventrally; moderately dense setae along outer margin apical half; uncus absent; socii arising from tegumen apicolaterally, moderately long lobe, slightly hooked, dilated apically, apex rounded, dense microtrichia, with long trichia apically; gnathos well-developed, arising from miglength of tegumen, band-like, sclerotized, disconnected medially, upper margin with long lobe laterally, tubular-like, apex rounded, densely long setose except basally with sparse setae; anellus closely surrounding basal half of aedeagus; aedeagus short, with dense cornuti; sacculus with group of moderately long setae basally, with sparse setae along basal opening margin to widened round lobe medially, with strongly edge, curved to cucullus basally, moderately dense setae along edge, dorsal with long, moderately dense setae; neck wide and short; cucullus broad, round at apex, dense spiniform setae along outer margin, with short spines close to outer margin, ventrobasally with small round lobe, prominenced, robusted, apicolaterally with small subtriangular lobe, with long 4-5 spines at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♂, genitalia slide NP88).

Distribution. Thailand, Japan and India.

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Unplaced *Rhopobota*

Rhopobota sp. A
Figs. 21.5, 62.3, 90.5

Description. *Head*: Lower frons white, upper frons white; labial palpus with first segment orange white to greyish orange, second segment brown mixed with dark brown, with white apically, apical segment white; vertex white to orange white.

Thorax: Protonal collar light brown to brown; tegulae with basal half dark brown, apical half orange white; mesonotum white to orange white mixed with dark brown laterally. Forewing (Fig. 21.5): Length 5.41 mm in male (n=2), 6.54 mm in female (n=1); male costal fold absent, termen deeply concave between wing apex and M_3; ground color white to orange white with diffuse greyish orange scales on inner margin; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal fascia incompleted extending from costa to R, dark brown; subbasal fascia present as dark brown spot between costa and Sc, inner margin with small patch basally, brown to dark brown, area between median fascia and wing apex present as subtriangular patch, extending from costa to midwing, white intermixed with diffuse greyish green, with dark brown on margins; wing apex dark brown; ocellus region with irregular sinuated line, dark brown between R_5 and CuA_2, surrounding with greyish orange scales; near outer margin with white transverse line extending from R_5 to outer margin between CuA_1 and CuA_2; outer margin with distinct greyish orange line, broken by white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 62.3): Tegumen broad, narrowed ventral half; densely scaled dorsolaterally; uncus absent; socii arising from tegumen apicolaterally,

moderately long, dilated apically, apex rounded, dense microtrichia apically; gnathos well-developed, arising from midlength of tegumen, sclerotized, with long tubular-like, slightly flattened, dilated apically, apex rounded, slightly curved medially, densely long setose over apical half and sparsely setose basally on back side; anellus forming cup-shaped surrounding basal half of aedeagus; aedeagus short with dense deciduous cornuti; sacculus with group of setae basally and along ventrobasal margin, median with moderately long, pointed triangular lobe, densely setose, with row of long, dense spiniform setae from base of triangular lobe towards cucullus basally; valva slightly concave medially forming neck; cucullus broad, with dense, long setae, except area close to outer margin with sparse setae on margin, dorsoapically with rounded lobe, with dense, long spines.

Female genitalia (Fig. 90.5): Sternum VII densely scaled, posterior margin deeply concave medially to half of sternum VII length, inner margin with sparse setae and dense microtrichia posterolaterally; tergum VIII densely scaled and sparsely setose on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis fused with lamella antevaginalis forming subquadrate sclerotized basal plate, with rised lobe, deeply concave laterally forming two lobe posterior 1/3, dense microtrichia, anterior 2/3 subtriangular pointed towards posterior margin, lateral margin folded ventrally; ostium bursae membranous, smooth rim on subtriangular lobe, colliculum small, short; ductus seminalis arising from midlength of ductus bursae; ductus bursae short; corpus bursae with inverted V-shaped, sclerotized on corpus bursae opening margin, with two blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂, genitalia slide NP396), 14°41'35"N 98°24'19"E, 29 Jul 2002 (1♂, genitalia slide NP375), 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♀, genitalia slide NP462).

Remarks. Specimens were collected throughout the year at 945-1,020 m in hill evergreen forest.

Rhopobota sp. B

Figs. 21.6, 90.6

Description. *Head*: Lower frons white, upper frons brownish orange to light brown; labial palpus with first segment light brown, second segment grey with light brown apically and dark brown spot dorsomedially, apical segment greyish orange; vertex brownish orange to light brown.

Thorax: Pronotal collar pale orange mixed with light brown; tegulae light brown intermixed with dark brown and orange white; mesonotum light brown intermixed with orange white. Forewing (Fig. 21.6): Length 5.3 mm in female (n=4); male costal fold absent; termen deeply concave between wing apex and M_3; ground color orange white with diffuse brown and dark brown scales; costal strigulae orange white, strigulae1-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled; basal and subbasal fascia indistinct; median fascia distinct extending obliquely to M_2 and curved to wing apex, dark brown; wing apex dark brown; ocellus region with irregular patch, light brown between M_1 and tornus; outer margin with distinct dark brown line broken by orange strigulae between R_5 and M_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing light brown dorsally and basally.

Female genitalia (Fig. 90.6): Sternum VII densely scaled, sparsely setose, posterior margin concaved medially, with transverse wrinkled surface medially; tergum VIII sparsely setose on posterior margin, triangular lateral extensions with sparsely setose; papillae anales rather narrowed, densely setose, lateral setae with papillose bases; lamella antevaginalis forming U-shaped band, moderately sclerotized, sparsely setose laterally; lamella postvaginalis sclerotized patch, dense microtrichia; ostium bursae with smooth rim, colliculum small, weakly sclerotized; ductus bursae short, encircled by large sclerotized plate, divided anteriorly to form unequal narrowed triangular, extending to corpus bursae; ductus seminalis arising from midlength of ductus bursae; corpus bursae with two signa, blade-like, pointed and curved medially.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♀, genitalia slide NP143), 14°34'01"N 98°27'28"E, 19 Jun 2002 (1♀, genitalia slide NP678), 14°41'41"N 98°24'12"E, 14 Jul 2003 (1♀), 17 Jul 2003 (1♀, genitalia slide NP633).

Remarks. Specimens were collected thorughout the year at 780-1,040 m in hill evergreen forest.

Rhopobota sp. C

Fig. 63.1

Description. Wing pattern poorly defined.

Male genitalia (Fig. 63.1): Tegumen moderately broad, rounded apically, narrowed ventrally; scaleless; uncus absent; socii arising from tegumen apicolatrally, broad basally, densely setose, with moderately long lobe, projecting dorsally, hooked, apical large with apical margin sinuated, dense microtrichia; gnathos well-developed, arising from near midlength of tegumen, band-like, sclerotized, narrowed medially, upper margin with large, long tube-like laterally, clavate, slightly curved medially, slightly flattened, apex rounded, densely long setose except basally with sparse setae; anellus closely surrounding basal 1/3 of aedeagus; aedeagus short, enlarged basally with moderately dense cornuti; valva broad; neck indistinct; sacculus with group of setae basally, with sparse setae along ventrobasal margin, median with lobe, moderately long, tubular, dilated apically, apex truncated, oblique, densely setose; cucullus broad, rounded with dense and long spiniform setae apical half, dense short and long spines basal half, outer margin with sparse setae, inner margin with small, pointed triangular lobe protuded, with dense, moderately long spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♂, genitalia slide NP142).

Remarks. Specimen was collected during the winter season at 1,040 m in montane evergreen forest.

Rhopobota sp. D

Figs. 21.7, 63.2

Description. *Head*: Lower frons and upper frons orange white; labial palpus with first segment dark brown, second segment dark brown mixed with brown, apical segment white; vertex pale orange to greyish orange becoming darker laterally.

Thorax: Pronotal collar dark brown mixed with brown; tegulae light brown mixed with brown to dark brown; mesonotum pale orange mixed with dark brown laterally. Forewing (Fig. 21.7): Length 5.72 mm in male (n=7), male costal fold absent, termen moderately concaved between R_5 and M_3; ground color orange white, costal strigulae white, strigulae 1-2 indistinct, strigulae 3-9 paired and separated by dark brown, pattern restricted to costal 2/3 to 1/2 of wing, with brown to dark brown band extending from base of Cu across apical end of discal cell to apex; fasciae poorly defined between longitudinal band and costa; subbasal fascia present as dark brown quadrate spot between strigulae 2 and 3 from costa to R; median fascia dark brown, narrow, extending from costa between strigulae 4 and 5 to R, with dark brown spots present between other pairs of strigulae; ocellus region with three brown dashes between M_1 and CuA_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 63.2): Tegumen moderately broad, narrowed ventrally; scaleless; uncus absent; socii arising from tegumen apicolaterally, broad basally, densely setose, with moderately long lobe, dilated apically, apex rounded, dense microtrichia; gnathos well-developed, arising from miglength of tegumen, band-like, sclerotized, narrowed medially, upper margin with long tube-like laterally, slightly flattened, dilated apically, apex rounded, slightly curved medially, densely long setose except basally with sparse setae; anellus forming cup-shaped surrounding basal half of aedeagus; aedeagus short with dense cornuti; sacculus with group of setae basally,

with sparse setae along ventrobasal margin and basal opening margin, median with lobe, short, narrowed tube, dilated at apex, densely setose; neck indistinct; cucullus broad, with dense and long spiniform setae, short spines close to outer margin, with row of short spines extending to near median lobe, sparse setae on outer margin, inner margin with moderately dense setae and round lobe protuded, with dense, long spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'01"N 98°27'28"E, 19 Jan 2002 (1♂), 14°35'08"N 98°38'20"E, 15 Jun 2002 (3♂, genitalia slide NP376), 14°39'02"N 98°31'40"E, 17Aug 2002 (1♂), 30 Sep 2002 (1♂, genitalia slide NP508), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP606).

Remarks. Specimens were collected throughout the year at 195-1,040 m in riparian forest, mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Rhopobota sp. E

Fig. 63.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 63.3): Tegumen moderately broad, narrowed ventrally; scaleless; uncus absent; socii arising from tegumen apicolatrally, moderately long lobe, slightly hooked, sclerotized apically, dense microtrichia ventrally, basally broad with sparse setae; gnathos well-developed, arising from midlength of tegumen, narrowed band-like, sclerotized, upper margin laterally with long, large, tube-like, dilated apically, apex rounded, slightly curved near apically, dorsal densely long setose except basal half with sparse setae; anellus forming cup-shaped surrounding basal half of aedeagus; aedeagus rather short, widened basally, with dense cornuti; juxta large; sacculus with group of long, moderately dense setae basally, with sparse setae along ventrobasal margin to median; basal opening with narrowed pointed lobe medially, sparsely setose, dorsal with sparse setae towards neck; neck distinct long and curved;

cucullus rather short, curved medially, apex with small round lobe, dorsobasally with lobe, dense spines except apical small lobe.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♂, genitalia slide NP726).

Remarks. Specimen was collected during the winter season at 947 m in hill evergreen forest.

Spilonota Stephens, 1834

Spilonota Stephens, 1834, Illust. Br. Ent. (Haustellata): 173. Type species: *Tortrix ocellana* [Denis & Schiffermüller], 1775.

Tmetocera Lederer, 1859, Wien. Ent. Monatschr. 3: 124. Type species: *Tortrix ocellana* [Denis & Scheffermüller], 1775.

Spilonota has been defined by the following characters; very diversely marked with a dark apical spot and with a notch at the base of the antenna and a costal fold in mostly male. The latter have their forewing divided by a somewhat sinuate oblique line from near base to apex into a darker grey costal portion and a very pale dorsal half. The genus has moderately long porrect, sinuate labial palpi and male hindwing often with a scale pencil concealed by the upturned anal margin. The male genitalia are diagnostic for the genus, with a well-developed uncus, nearly always dorso-ventrally flattened and often deeply cleft medially, with naked and sclerotized socii originating from the inner side of the tegumen, either swollen and triangular, band-like or slender and elbowed and with a long, slender valva always with at least one prominent thorn or spine ventrally or subdorsally on the cucullus. The female genitalia have a sclerotized, funnel-shaped sterigma fused with the concave hind margin of sternum 7. The ductus bursae usually is posteriorly sclerotized up to small but conspicuous colliculum of thickened membrane, followed by a short membranous portion then by an often irregularly sclerotized anterior half, with two large, thorn-

shaped signa with a sclerotized, round or triangular base (Kuznetsov, 1987). The genus includes 34 species worldwide. *Spilonota* includes 11 species have been described from Southeast Asia (Brown, 2005).

Spilonota babylonica Meyrick, 1912

Fig. 64.1

Spilonota babylonica Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 854. Type locality: India (Nilgiri Hills). Holotype (♂): BMNH.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 64.1): Tegumen high, narrowed, widened and rounded apically, with moderately dense scales along outer margin; uncus absent; socii arising from tegumen apicolaterally, curved medially, apex projecting dorsally, moderately long, rounded at apex, sparsely setose; gnathos arising from midlength of tegumen, membranous, with sparse long setae; caulis widened, short; anellus closely surrounding basal of aedeagus; aedeagus moderately long, with 6-7 cornuti, long over half of aedeagus length; juxta triangular; valva curved medially forming neck; sacculus with group of moderately dense, long setae basally, continued with moderately long, dense spiniform setae towards median area, ventral margin with sparse setae, median with short, sparse setae between basal opening and neck, dorsal with dense setae towards cucullus apically; neck slightly rotated to cucullus; cucullus short, flattened, widened, with dense moderately long spines, apex with single moderately long, stout spine.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♂, genitalia slide NP568).

Distribution. Thailand (new record) and India.

Remarks. Specimen was collected during the winter season at 180 m in mixed deciduous forest.

Spilonota melanocopa (Meyrick), 1912
Figs. 21.8, 64.2, 91.1

Enarmonia melanocopa Meyrick, 1912, J. Bombay Nat. Hist. Soc. 21: 853. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. *Head*: Lower frons white mixed with brown, upper frons light brown; labial palpus with first segment yellowish white, second segment orange white to greyish orange with brown to dark brown spots basally, ventroapically and dorsomedially, apical segment orange white; vertex brown to dark brown with orange apices; antenna with notch between flagellomere 5 and 6.

Thorax: Pronotal collar brown to dark brown with orange white apices; tegulae brown to dark brown basal half, apical half light brown; mesonotum brown mixed with dark brown. Forewing (Fig. 21.8): Length 6.22 mm in male (n=4), 7.04 mm in female (n=2); male costal fold present extending from wing base to near strigulae 7 and from costa to R_1; costal margin convex on costal fold area; termen straight; ground color white to orange white mixed with diffuse transverse lines; costal strigulae white, strigulae 1-6 indistinct, strigulae 7-9 paired and separated by dark brown, basal patch indistinct present as irregular brown to dark brown on wing base, costal margin with large dark brown spot cover costal fold posterior end, distal margin close to strigulae 7, extending from costa to R vein; inner margin with dark brown strip extending from basal 1/3 curve upwardly to R vein and curve downwardly to inner margin near tornus, ocellus region with irregular strip dark brown, extending from R_5 to tornus; outer margin with distinct dark brown strip extending from wing apex to tornus, except between R_1 and M_1, M_1 and M_2 with white strigulae. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, anal margin forming narrow groove with long hair pencil, dark brown extending from wing base to outer margin, light brown ventrally.

Male genitalia (Fig. 64.2): Tegumen moderately broad, narrowed ventrally, with moderately dense setae along outer margin, apically forming subtriangular, rounded at apex, without scales; socii arising from tegumen 1/4 apicolaterally, moderately long, sclerotized, sparsely setose; gnathos arising from midlength of tegumen, moderately sclerotized, deeply curved upward medially; caulis widened; anellus closely surrounding basal 1/4 of aedeagus; aedeagus rather short, with 15 deciduous cornuti; sacculus with group of moderately dense, long setae basally, median with dense, short spiniform setae between basal opening towards cucullus basally, dorsal sparsely setose towards cucullus; valva deeply concave ventromedially forming moderately long; cucullus short, large and widened, dilated apically, dense scales and spiniform setae, apical margin with four, distinct short spines and sparse setae.

Female genitalia (Fig. 91.1): Sternum VII with large sclerotized plate, densely scaled and sparse setae, with dense microtrichia restricted on posterolateral area; tergum VIII without scales or setae, with moderately dense scales and sparse setae on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis forming transverse, widened plate, slightly sclerotized, dense microtrichia; lamella antevaginalis reduced forming large round lobe, narrowed edge, slightly sinuated, dense microtrichia; antrum small, cup-like; colliculum small, slender, weakly sclerotized; ductus bursae with large sclerotized plate near medially, twisted, long near half of ductus bursae length; ductus seminalis arising from near midlength of ductus bursae; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (1♂, genitalia slide NP370), 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP427), 22 Oct 2003 (2♂, genitalia slide NP580, NP682), 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♀, genitalia slide NP481), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂).

Distribution. Thailand and India.

Remarks. Specimens were collected throughout the year at 180-950 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Unplaced *Spilonota*

Spilonota sp. A

Figs. 22.1, 91.2

Description. *Head*: Lower frons white to yellowish white mixed with light brown; labial palpus with first segment white, second segment white with brown to dark brown spots basally, dorsomedially and ventroapically, apical segment white; vertex white to orange white mixed with brown.

Thorax: Pronotal collar greyish brown, tugulae orange white intermixed with dark brown, mesonotum white to orange white intermixed with dark brown. Forewing (Fig. 22.1): Length 5.96 mm in female (n=6), male costal fold absent, white with diffuse dark brown strip; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch incompleted present as irregular patch with diffuse spots extending from wing base to strigulae 3 and from costa to inner margin, dark brown; median fascia incompleted, dark brown broken by ground color, present as spot extending from costa to R_2, large spot on midwing between R vein and between CuA_1 and CuA_2, with subtriangular pretornal spot on inner margin; postmedian fascia extending from costa to R_4, dark brown, apical wing with dark brown strip extending obliquely from wing apex to M_3; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside light brown with yellowish white to yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 91.2): Sternum VII with large sclerotized plate, densely sclaed and sparsely setose on lateral area, posterior margin concave, lateromedially with small lobe prominenced, anteromedial area sparsely setose, with two distinct sclerotized ridge on inner surface, moderately long, each ridge extending obliquely

from anterolateral margin to median area, posteromedial area with dense microtrichia, sparse setae and scales; tergum VIII without scales or setae; paillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis reduced; lamella antevaginalis fused with posterior margin of sternum VII, forming moderately large round lobe, raised, densely scaled, ductus bursae with large sclerotized plate posteriorly, encircled, long 1/3 of ductus bursae; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae without signa, with small, sclerotized patch near ductus bursae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°42'26"N 98°24'37"E, 10 Mar 2002 (1♀, genitalia slide NP284), 14°41'31"N 98°24'27"E, 13 May 2002 (1♀, genitalia slide NP552), 14°41'27"N 98°27'29"E, 14 May 2002 (1♀, genitalia slide NP547), 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♀, genitalia slide NP453), 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♀, genitalia slide NP438), 19 Dec 2003 (1♀, genitalia slide NP680).

Remarks. Specimens were collected throughout the year at 180-955 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Strepsicrates Meyrick, 1888

Sterpsicrates Meyrick, 1888, Trans. Proc. New Zealand Inst. 20: 73 [replacement name for *Strepsiceros*].

Strepsiceros Meyrick, 1881, Proc. Linn. Soc. N. S. W. 6: 678. Type species: *Sciaphila ejectana* Walker, 1863. [preoccupied].

Monilia Walker, 1866, List Specimens Lepid. Insects Colln. Br. Mus. 35: 1741. Type species: *Monilla semicanella* Walker, 1866 [=*Strepsicrates smithiana* Walsingham, 1892].

Phthinolophus Dyar, 1903, Proc. Ent. Soc. Wash. 5: 307. Type species: *Phthinolophus indentanus* Dyar, 1903.

Phthenolophus Busck, 1910, Proc. Ent. Soc. Wash. 12: 132. [misspelling of *Phthinolophus*].

Strepsicrates has been defined by the following characters; rather narrow-winged greyish or brownish with a dorsal notch at the base of antenna and with a costal fold as well as hindwing anal fold containing a scale pencil in the male. The genus has moderately long, porrect, sinuate labial palpi. The genus recognized at species level by wing pattern, the remaining *Strepsicrates* species can superficially be separated only tentatively on the basis of the forewing structure. The male genitalia are diagnostic for the genus with a triangular to digit-shaped ventral process on the cucullus closely associated with a single spine, a bipartile uncus often developed into strongly modified and widely separate arm, reduced, small, membranous socii, and a large, barrel-shaped anellus. The female are characterized by a signum fused with deeply concave hindmargin of sternum 7, a short ductus bursae narrowed below the ostium by a split colliculum of thickened membrane, sclerotized and twisted to origin of ductus seminalis. The corpus bursa is partially lined with sharp spinulose and lacks signa. The genus includes 26 species worldwide. *Sterpsicrates* includes 4 species have been described from Southeast Asia (Brown, 2005). Heinrich (1923) reported that *Myrica cerifera* (Myricaceae) as one of the hosts for North American *S. indentata*. Clarke (1971) reported that *Strepsicrates holotephras* feed on some species of Myrtaceae.

Strepsicrates discobola Diakonoff, 1968

Figs. 22.2, 64.3, 91.3

Strepsicrates discobola Diakonoff, 1968, Bull. U.S. Nat. Mus. 257 (1967): 85. Type locality: Philippine Is. (Davao Province, Mindanao, E slope Mt. McKinley). Holotype (♂): USNM.

Description. *Head*: Lower frons yellowish white, upper frons orange grey with white apices; labial palpus with first segment yellowish white mixed with dark brown, second segment yellowish white to yellowish grey mixed with dark brown spot basally, with transverse dark brown strip medially, ventroapically with dark brown spot, apical segment orange white mixed with dark brown; vertex brown to dark brown with orange white apices mixed with orange white scales.

Thorax: Pronotal collar dark brown; tegulae light brown mixed with brown and dark brown; mesonotum brown to dark brown with yellowish white medially. Forewing (Fig. 22.2): Length 6.9 mm in male (n=8), 7.72 mm in female (n=7), male costal fold present extending from wing base to midwing, termen rather round, ground color white to yellowish white, costal strigulae brown, strigulae 1-4 indistinct, strigulae 5 and 6 singled, strigulae 7-9 paired and separated by dark brown; fascia indistinct suffused with patch, brown to dark brown extending from wing base to outer margin and from costa to inner margin 2/3; inner margin with white to yellowish white to patch ventral 1/3; outer margin with dark brown line broken by yellowish white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa and outer margin between viens. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 64.3): Tegumen moderately broad, widened apically, with moderately dense scales along outer margin; uncus widened, bifurcated, with slender lobe apicolaterally, curved, pointed at apex, densely setose on outer margin; socii short, small round lobe, moderately dense, long setae; gnathos arising from near midlength of tegumen, band-like, slightly sclerotized; anellus cup-like, surrounding basal of aedeagus; aedeagus rather short, curved medially, with 10 cornuti medially, long 1/3 of aedeagus; neck short; sacculus with moderately dense, long setae basally, median with dense, long and short spiniform setae between basal opening towards cucullus basally, dorsal with sparse setae towards cucullus; cucullus short, round apically, dense long spines dorsoapical half, ventral margin with large subtriangular lobe, sparsely short setose, with single short strong spine on margin near triangular point.

Female genitalia (Fig. 91.3): Sternum VII sclerotized plate, posterior margin slightly concaved, densely scaled, except anterior margin and posterior margin, including posteromedially, posterior marginal area with dense microtrichia, except small area medially; tergum VIII without scales or setae, with dense scales and sparse setae on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis reduced, lamella antevaginalis forming narrowed, smooth rim, sclerotized; ostium bursae moderately widened, cup-like antrum, sclerotized; colliculum rather short, slightly sclerotized; ductus bursae short, with moderately large sclerotized plate medially, long 1/3 of ductus bursae length, anterior with one edge thickened; ductus seminalis arising from anterior 1/4 of ductus bursae; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 13 Jan 2002 (6♂, genitalia slide NP156, NP163, NP167, NP171, NP174, NP176, 2♀, genitalia slide NP157, NP175), 14°41'41"N 98°24'12"E, 6 Feb 2002 (4♀, genitalia slide NP187, NP188, NP189, NP191), 14°42'63"N 98°23'56"E, 11 Mar 2002 (1♂, genitalia slide NP287), 14°41'31"N 98°24'27"E, 13 May 2002 (1♀, genitalia slide NP535), 14°41'32"N 98°24'17"E, 13 Jun 2002 (1♂, genitalia slide NP537).

Distribution. Thailand (new record) and Philippine Is.

Remarks. Specimens were collected during the winter season and the summer season at 850-1,020 m in mixed deciduous forest and hill evergreen forest.

Tritopterna Meyrick, 1921

Tritopterna Meyrick, 1921, Zool. Meded. 6: 151. Type species: *Tritopterna chinostoma* Meyrick, 1921.

Tritopterna has been defined by the following characters; narrow-winged with variably patterned or mottled greyish to dark brownish forewings with several tufts of

raised scales on dorsal half, with 4-6 conspicuous, paired, whitish costal strigulae, with blackish streaks along parts of M_1 and M_2 and often with a dark erect triangle on the dorsum before tornus, wings sometimes variably suffused with whitish from dorsum. The male has a projecting tuft of recurved scales from the base of forewing dorsum. The genus has a large, sinuate, porrect labial palpi with the second segment strongly widened near the middle and triangular, the terminal segment long and slender with white inner surface. Males of *Tritopterna* have a band of modified scales forming a pencil along the base of the anterior margin of the hindwing. The male genitalia are characterized by subtriangular tegumen with two curved, strong bristles on each side of the flattened apex, by sclerotized naked and hook-like socii, by long, slender and medially narrowed valvae with a series of large tuft of flattened bristles from outer surface near ventral margin in basal half, with a large, triangular, keel-shaped process from inner surface below end of basal excavation and usually with the base of the cucullus with a patch of short spines on the ventral margin, often as a projecting angle, by a short caulis and a smallish aedeagus without cornuti. The female genitalia are characterized by a ventrally more or less raised, sclerotized ring around the entrance to the ostium, surrounded by spinulose membrane and fused into the V-or U-shaped excavation in the hindmargin of sternum 7 and by a short, sclerotized ductus bursae which is longitudinally folded and twisted, barrel-shaped segment 8 with an anteromedially infolded tergum 8, and lack signa. The gunus includes 5 species worldwide. *Tritopterna* includes 2 species have been described from Southeast Asia (Brown, 2005). *Acoclita anachastopa* (Meyrick) has been reared from fruits of *Glochidion* and flowers of *Mallotus* (Euphorbiaceae) in Java (Clarke, 1958).

Tritopterna anachastopa (Meyrick), 1934

Figs. 22.3, 64.4

Acroclita anachastopa, Meyrick, 1934, Exotic Microlepid. 4: 483. Type locality: Indonesia (Java, Telawa). Lectotype (♂): BMNH.

Description. *Head*: Lower frons orange white, upper frons brown to brown appressed; labial palpus with first segment white mixed with dark brown, second segment dark brown mixed with transverse patch medially, greyish yellow mixed with light brown strip dorsally, apical segment brown with yellowish white apices; vertex brown to dark brown.

Thorax: Tegulae dark brown; mesonotum dark brown. Forewing (Fig. 22.3): Length 4.54 mm in male (n=2); male costal fold absent; termen concaved between wing apex and M_3; ground color yellowish grey intermixed with diffuse transverse brown to dark brown line strigulae white, strigulae 1-2 indistinct, stigulae 3-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled; basal patch extending from wing base to strigulae 3 and from costa to inner margin, dark brown; median fascia diffuse on costa brownish orange mixed with dark brown extending from costa to R_1 and extending irregular obliquely to inner marginm, dark brown, strigulae 5-9 with brownish orange striae extending obliquely to R veins; ocellus region with irregular dark brown strip extending from R_5 to tornus; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally, ventral light brown.

Male genitalia (Fig. 64.4): Tegumen broad, anterior margin with small pointed process apicomedially, with dense short microtrichia and moderately dense scales along outer margin, dorsal margin with six distinct long setae, curved, pointed ventrally, with sparse setae; uncus short, widened basally, densely setose, apex with sclerotized process, narrowed and pointed, without setae; socii arising from base of uncus basally, small, forming sclerotized pointed, narrowed lobe, projecting laterally, without setae; gnathos arising from tegumen over basal 1/3, narrowed band-like, slightly sclerotized; anellus cup-like, surrounding basal 1/3 of aedeagus; aedeagus rather short; cornuti absent; sacculus with group of moderately long setae basally, with two long scale-like setae, ventroposterior surface with dense microtrichia, median with moderately large subtriangular lobe, apex rounded, without setae, and moderately dense short setae and short spiniform setae, apex bifided, between basal

opening and neck, ventromedial margin with sparse setae and two long scale-like setae, flattened; neck moderately long, wide; cucullus short, rather widened, apex rounded, dense long spiniform setae, with dense short spines close to outer margin between cucullus medially towards ventrobasal round lobe; outer margin with sparse short spines and sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'33"N 98°24'08"E, 11 Jan 2002 (1♂, genitalia slide NP87), 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP516).

Distribution. Thailand (new record) and Java.

Remarks. Specimens were collected during the winter season at 990-1,020 m in hill evergreen forest.

Unplaced Eucosmini

Genus A sp. A

Figs. 22.4, 65.1

Description. *Head*: Lower frons orange white, upper frons brown; labial palpus with first segment light brown, second segment light brown to brown, apical segment dark brown; vertex brown.

Thorax: Pronotal collar light brown to brown; tegulae and mesonotum poorly defined. Forewing (Fig. 22.4): Length 4.17 mm in male (n=1); male costal fold absent, termen slightly concave near wing apex; ground color white, costal strigulae white, strigulae 1-2 indistinct, strigulae 2-8 paired and separated by dark brown, strigulae 9 singled; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, brown to dark brown, with dense scales tuft, dark brown, near wing base extending from costa to midwing; median fascia with indistinct patch on costal margin extending from strigulae 4 to strigulae 7 and from costa to R_3, brown, inner margin

with indistinct patch from midwing to tornus, brown; ocellus region with patch extended from R_4 to M_3, light brown mixed with dark brown; preterminal fascia distinct on costa extending from costa to R_4, brown mixed with dark brown; wing apex brown mixed with dark brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins, with dense scales tuft near wing base dorsal half. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 65.1): Tegumen broad, densely long setose on outer margin; uncus bifurcated, moderately long, dilated apically, apex rounded; socii arising from apicolateral 1/4 of tegumen, small round lobe, densely setose dorsal half; gnathos arising from miglength of tegumen, band-like, sclerotized basally, narrowed medially; anellus closely surrounding near basal half of aedeagus; aedeagus moderately long, large; vesica with long, dense microtrichia; dense cornuti, long half of aedeagus, with three short thorns apically; sacculus larger than cucullus, with group of short setae basally, connected with long, thickened, dense setae towards ventromedially, median surface with sparse setae, with sclerotized smooth ridge from ventromedially towards neck ventrobasally, ventrolateral surface with moderately long, large lobe, apex pointed, projecting laterally, dorsoapical half slightly concave with group of dense setae dorsally, dorsal with moderately dense setae towards neck; neck moderately long, deeply concave ventrally; cucullus short, slender, apex acuted, dense spines apical half.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (1♂, genitalia slide NP522).

Remarks. Specimen was collected during the summer season at 255 m in dry evergreen forest.

Genus B sp. A

Figs. 22.5, 91.4

Description. *Head*: Lower frons orange white, upper frons brown; labial palpus with first segment yellowish white, second segment brown to dark brown with yellowish white basally extending to ventromedially, and yellowish spot dorsally, apical segment light brown with yellowish white apices; vertex light brown mixed with greyish orange.

Thorax: Pronotal collar brown to dark brown; tegulae light brown; tegulae light brown mixed with brown; mesonotum light brown to brown with yellowish white. Forewing (Fig. 22.5): Length 3.92 mm in female (n=1); termen concave between wing apex and M_3; ground color yellowish white mixed with diffuse and regular brown strip, costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown, except strigulae 5 and 6 singled; basal fascia indistinct present as transverse irregular brown strip; subbasal fascia distinct extending obliquely to midwing and extending obliquely to inner margin, pointed at midwing, dark brown; median fascia distinct extending from costa enlarged to R vein, brown to dark brown; ocellus region with diffuse brown to dark brown spot, with transverse line near outer margin extending from M to tornus, greyish brown; outer margin with distinct yellowish white line extending from R_5 to CuA_1; wing apex dark brown with yellowish white spots between R_4 and R_5, R_5 and M_1 with yellowish white strigulae on outer margin. Underside light brown with yellowish grey spots on costa and outer margin between veins, and yellowish white line on outer margin. Hindwings brown dorsally, light brown ventrally.

Female genitalia (Fig. 91.4): Sternum VII densely scaled and sparsely setose posterior half, except on posterior margin, anterior half with dense microtrichia; tergum VIII without scales or setae; triangular lateral extensions with moderately dense scales and sparse setae; papillae anales densely setose, lateral setae with papillose bases; sterigma present on sternum VII medially; lamella antevaginalis forming sclerotized ridge, extending obliquely to small rigid lateral angle and

extending obliquely to posteromedially connected with lamella postvaginalis, forming large, slightly sclerotized plate, dense microtrichia posteriorly; ostium bursae present on sternum VII anteromedially; ductus bursae short, posterior half with long sclerotized plate, encircled, divided to form long digitate, projecting into corpus bursae; ductus seminalis arising from midlenth of ductus bursae; corpus bursae with two signa, narrowed, pointed thorn-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 10 Jun 2002 (1♀, genitalia slide NP526).

Remarks. Specimen was collected during the summer season at 255 m in dry evergreen forest.

Genus C sp. A

Fig. 91.5

Description. Wing pattern poorly defined.

Female genitalia (Fig. 91.5): Sternum VI with dense microtrichia posteriorly; sternum VII sclerotized plate, concave posteromedially, forming shallowed and widened groove posteromedial half, anteromedial half with large lobe prominenced, dense microtrichia throughout, sparsely setose, densely scaled laterally to posterior 1/3 and posteromedially towards anteromedially; tergum VII with dense microtrichia, triangular lateral extensions with moderately dense scales and sparse setae; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis with dense microtrichia and sparse setae laterally, lamella antevaginalis forming sclerotized band, smooth rim; ostium bursae rounded, colliculum small, sclerotized; ductus bursae with large sclerotized plate over anterior half, completed encircled by narrow band near middle, divided to form two long, slender unequal plate, pointed at apex, extending into corpus bursae; ductus seminalis from mid of ductus bursae; corpus bursae with two signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 23 Dec 2001 (1♀, genitalia slide NP40).

Remarks. Specimen was collected during the winter season at 956 m in montane evergreen forest.

Genus C sp. B

Fig. 91.6

Description. *Head*: Lower frons greyish white, upper frons brown to dark brown; labial palpus with first segment orange white, second segment pale orange with dark brown spots dorsomedially, dorsoapically, apical segment dark brown with yellowish white apically; vertex orange white mixed with light brown.

Thorax: Pronotal collar light brown; tegulae orange grey mixed with brown to dark brown; mesonotum brown to dark brown intermixed with orange grey.
Forewing : Length 4.54 mm in female (n=1); termen slightly concaved between wing apex and M_3; ground color greyish mixed with diffuse, irregular transverse line, dark brown; costal strigulae orange white, strigulae1-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled; basal patch indistinct present as irregular transverse lines, dark brown extending from costa to inner margin; median fascia present as distinct dark brown patch extending obliquely from costa to midwing; postmedian and preterminal fascia present as dark brown spots on costa, interfascia between strigulae 7 and 8 with grey striae extending obliquely from costa to outer margin; ocellus region with short, dark brown strip between veins from M_1 and tornus; wing apex dark brown; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 91.6): Sternum VII with large sclerotized plate, concave posteriorly and deeply concave posteromedially, sclerotized rim ventrally, densely scaled, sparsely setose, anterior margin moderately sclerotized band, scaleless,

anterolaterally with small wrinkled patch; tergum VII without scales or setae, with moderately dense scales on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis and lamella antevaginalis reduced; ostium bursae with smooth rim, colliculum small, moderately sclerotized; ductus bursae with large, long sclerotized plate, 4/5 anteriorly, divided anteriorly to form two long, slender plate, rounded at apex, extending into corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two signa, blade-like, left signum larger than right.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (1♀, genitalia slide NP426).

Remarks. Specimen was collected during the summer season at 255 m in dry evergreen forest.

Genus D sp. A

Figs. 22.6, 65.2, 65.3

Description. *Head*: Lower frons white to orange white, upper frons yellowish white mixed with light brown; labial palpus with first segment orange white, second segment dark brown with orange white basally through ventrally, with orange white spot medially, apical segment light brown with orange white apically; vertex dark brown mixed with orange white.

Thorax: Pronotal collar brown; tegulae dark brown; mesonotum dark brown with greyish orange posterior end. Forewing (Fig. 22.6): Length 4.0 mm in male (n=1); male costal fold presented extending from wing base to strigulae 5 and from costa to R vein; termen concave between wing apex and CuA_1; ground color greyish orange mixed with transverse irregular dark brown striae, costal strigulae white, strigulae 1-2 indistinct, strigulae 3 and 4 and 6 paired and separated by dark brown, strigulae 5 and 7-9 singled; basal patch incompleted extending from wing base to strigulae 3 and from costa to inner margin broken by transverse irregular greyish

orange strips, distal margin extending obliquely to midwing, pointed and extending to inner margin, dark brown; median fascia incompleted extending from costa to inner margin, dark brown broken by ground color, distal margin extending obliquely from costa to M_1, pointed, and extending to inner margin; subtriangular pretornal spot, dark brown extending from inner margin to M_3, strigulae 5 and 6 with silvery light brown striae extending obliquely from costa to inner margin; ocellus region with irregular dark brown strip between R_5 and tornus; outer margin with distinct dark brown line broken by white strigulae between R_5 and M_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 65.3): Tergum VIII with subquadrate lobe on anterior margin, slightly covered tergum VII, with dense long scales along anterior edge.

Male genitalia (Fig. 65.2): Tegumen high, moderately broad, scaleless, rounded and sparsely setose apically, anterior margin with small pointed lobe dorsomedially, ventral with group of scales tuft, very dense long scales and some very long scales; socii long, tubular-like, apex rounded, sparsely setose, with small group of long setae near apex; gnathos arising from basal 1/3 of tegumen, band-like, sclerotized, upper part connected with membranous medially, dense microtrichia, basolaterally with sclerotized plate, moderately long, rounded lobe, projecting ventrally; anellus closely basal of aedeagus; aedeagus moderately long, slender, with 5 deciduous cornuti; sacculus with group of dense setae basally, basal opening with row of moderately dense, long setae, ventromedially with group of setae, dorsal area with membranous large lobe extending over basal opening, with dense long setae; neck distinct narrowed, long, sparsely setose; cucullus moderately long, widened medially, tapered to apex, pointed, densely setose, with dense spines on ventral margin, upper margin with round lobe medially, densely setose basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂, genitalia slide NP510).

Remarks. Specimen was collected during the summer season at 937 m in hill evergreen forest.

Genus E sp. A

Figs. 22.7, 65.4

Description. *Head*: Lower frons orange white, upper frons white to yellowish white; labial palpus with first segment brown to dark brown, second segment light brown intermixed with brown, with white apically, apical segment white; vertex dark brown mixed with white to yellowish white anteriorly.

Thorax: Pronotal collar dark brown; tegulae dark brown; mesonotum dark brown. Forewing (Fig. 22.7): Length 6.31 mm in male (n=2); male costal fold absent, termen rather straight; ground color orange white; costal strigulae white strigulae 1-2 indistinct, strigulae 3-4 present as three spots, strigulae 5-9 singled; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, dark brown; median fascia distinct, present as large patch extending from costa to inner margin, dark brown, strigulae 5 with irregular brownish orange striae extending from costa to tornus; ocellus region with dense dark brown small spots between R_4 and M_2, strigulae 5-9 with brownish orange striae extending obliquely to R_4; outer margin with distinct dark brown line, with white strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3. Underside light brown mixed with dark brown patch, with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally covered by narrow scales, ventral light brown.

Male genitalia (Fig. 65.4): Tegumen moderately broad, narrowed ventrally, scaleless; uncus large, widened basally, bifurcated, long, pointed at apex, concaved apically, each lobe come closer apically, apex divergented, moderately dense short setae, except apically; socii small, rounded at apex, sparsely setose; gnathos arising from midlength of tegumen, slightly sclerotized basally; anellus surrounding basal of aedeagus; aedeagus rather short, moderately widened; cornuti absent; juxta triangular; sacculus with moderately dense setae basally towards neck, median with dense short

spines along basal opening, extended dorsomedially, with sparsely setose dorsally; valva slightly concave ventrally forming neck; cucullus widened, apex rounded, with moderately long, dense spines mixed with moderately dense setae; outer margin with one distinct, strong and short spine medially, apical margin with sparsely long setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'38"N 98°24'17"E, 4 Feb 2002 (1♂, genitalia slide NP362), 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂, genitalia slide NP555).

Remarks. Specimens were collected during the winter season and the summer season at 935-995 m in hill evergreen forest.

Genus F sp. A

Figs. 22.8, 65.5

Description. *Head*: Lower frons and upper frons yellowish white; labial palpus with first segment and second segment light brown, apical segment brownish orange; vertex orange white to orange grey.

Thorax: Pronotal collar brownish orange; tegulae and mesonotum orange white intermixed with light brown. Forewing (Fig. 22.8): Length 3.72 mm in male (n=2); male costal fold absent, termen oblique, with straight margin; ground color and costal strigulae orange white, strigulae 1-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled; basal patch present irregularly extending from wing base to strigulae 3 and from costa to inner margin, dark brown, distal margin extending obliquely from costa to midwing, angled and extending inwardly to inner margin; median fascia extending oblique irregularly from costa to inner margin near tornus, separated by ground color; postmedian fascia present as narrow dark brown line extending obliquely from costa to outer margin at M_1; preterminal fascia present as brown spot on costa; ocellus region with small, irregular patch, dark brown. Underside light brown. Hindwing light brown dorsally and basally.

Male genitalia (Fig. 65.5): Tegumen narrowed, with sparsely setose along outer margin, dorsal rounded with moderately dense scales and sparse setae; uncus absent; socii large plate, membranous, sparsely setose; gnathos arising from midlength of tegumen, slightly sclerotized basally; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long, widened basally, tapered to apex, with 4 long cornuti apical half, outer surface with moderately dense denticles apically; valva deeply concaved ventrally forming neck, moderately long; sacculus with sparsely setose along ventral margin, with large lobe ventromedially, with very dense, short spines at apex, dorsal with moderately dense setae; neck with moderately dense setae and short spiniform setae; cucullus short, widened, slightly flattened, concaved medially, sparsely setose, upper margin rounded, densely setose, apex with single, moderately long, sclerotized spine.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'32"N 98°24'17"E, 13 Jun 2002 (1♂, genitalia slide NP511), 14°41'35"N 98°24'19"E, 2 Oct 2002 (1♂, genitalia slide NP551).

Remarks. Specimens were collected during the summer season and the rainy season at 955-965 m in hill evergreen forest.

Genus G sp. A

Fig. 66.1, 66.2

Description: Wing pattern poorly defined.

Abdomen (Fig. 66.2): Tergum VIII with subquadrate lobe on anterior margin, slightly covered tergum VII, with dense long scales along anterior edge.

Male genitalia (Fig. 66.1): Tegumen moderately broad, narrowed ventrally, with moderately dense scales along outer margin; uncus large, moderately long, hooked, moderately dense setae basally, apex with large bilobed, apex rounded, without setae; socii absent; gnathos well-developed, arising from basal 1/3 of tegumen,

upper margin forming large sclerotized plate, extending long dorsally, basal widened, concaved medially, dilated and round apically, dense microtrichia apically except on apex, with group of dense denticles apicolaterally, with two sclerotized lines extending from base curved to apicolateral margin; anellus surrounding basal of aedeagus; aedeagus rather short, slender; cornuti absent; sacculus with group of short setae basally, ventromedially with row of long setae, median with dense short spines between basal opening and neck, some spines with bifided apices; posterior surface with 2-4 long spine-like scales, dorsal with sparsely setose; neck long, narrowed, slightly curved, sparsely setose; cucullus short, large, sparsely setose, rounded apically with dense long spines, outer margin with short spines, except on ventral round lobe.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP525).

Remarks. Specimen was collected during the summer season at 742 m in hill evergreen forest.

Genus H sp. A

Figs. 23.1, 92.1

Description. *Head*: Lower frons yellowish white mixed with light brown, upper frons light brown; labial palpus with first segment yellowish white mixed with light brown, second segment light brown mixed with brown, with dark brown spot dorsomedially, apical segment brown; vertex light brown.

Thorax: Pronotal collar brown; tegulae brown; mesonotum light brown intermixed with brown. Forewing (Fig. 23.1): Length 5.22 mm in female (n=1); termen concave between wing apex and CuA_1; ground color yellowish grey; costal strigulae yellowish white, strigulae 1-7 paired and separated by dark brown, strigulae 8 indistinct or absent, strigulae 9 singled; basal fascia indistinct; subbasal fascia distinct on costa present as dark brown spot, extending irregularly to inner margin,

light brown; median fascia distinct on costa extending irregular obliquely from costa to inner margin brown mixed with dark brown; interfascia between strigulae 5 and 6 with irregular dark brown striae extending obliquely from costa to R_4 and curved to between CuA_1 and CuA_2; wing apex dark brown; ocellus region with line, cresent-shaped from between R_5 and M_1 to between CuA_1 and CuA_2, outer margin with distinct dark brown striae broken by yellowish white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 92.1): Sternum VII with large sclerotized plate, posterior margin concaved medially, densely scaled, with sclerotized ridge anteromedially, horizontal, moderately long; tergum VIII sparsely scaled posteriorly, except posteromedially, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; sterigma developed forming semicircular plate, with ostium bursae medially, lamella antevaginalis forming a widened ring, scaleless, fused with lamella postvaginalis laterally which forming moderately large plate, with dense scales posterolaterally; ostium bursae with anterior margin sclerotized, concaved medially, antrum forming a small, sclerotized cup; ductus bursae with sclerotized plate, long, medially; ductus seminalis arising from basal 1/3 of ductus bursae; corpus bursae with two large signa, slightly curved, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (1♀, genitalia slide NP341).

Remarks. Specimen was collected during the summer season at 195 m in mixed deciduous forest.

Genus I sp. A

Figs. 23.2, 92.2

Description. *Head*: Lower frons poorly defined, upper frons brown to dark brown; labial palpus with first segment pale orange, second segment greyish orange mixed with dark brown, apical segment brown to dark brown; vertex pale orange mixed with brown.

Thorax: Pronotal collar orange grey; tegulae light brown mixed with dark brown basally, some scales with orange white apices; mesonotum orange grey intermixed with light brown and dark brown. Forewing (Fig. 23.2): Length 5.31 mm in female (n=1); termen slightly concaved between wing apex and M_3; ground color and costal strigulae orange white, strigulae 1-2 indistinct, strigulae 3-7 paired and separated by dark brown, strigulae 8-9 singled; basal patch present irregularly, dark brown extending from wing base to strigulae 3 and from costa to inner margin, separated by ground color, distal margin extending oblique outwardly from costa to midwing, angled and extending inwardly to inner margin; median fascia indistinct extending irregularly from costa to inner margin near tornus, with distinct longitudinal dark brown strip in discal cell area; preterminal fascia present as irregular dark brown strip from costa to outer margin at CuA_1; wing apex dark brown; outer margin with dark brown line, broken by yellowish white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 92.2): Sternum VII with large, sclerotized plate, densely scaled; tergum VIII and triangular lateral extensions sparsely setose posteriorly; papillae anales small, narrowed, moderately dense setae; posterior apophyses long, anterior and posterior apophyses with posterior end dilated; lamella antevaginalis reduced, lamella postvaginalis forming large plate, extending posteriorly, dense microtrichia and sparsely setose; ostium bursae with anterior margin membranous, smooth, antrum forming a wide, cup-shaped; ductus bursae with small, sclerotized

plate at posterior end; ductus seminalis indistinct; corpus bursae large, with two slightly curved signa, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 17 Apr 2002 (1♀, genitalia slide NP315).

Remarks. Specimen was collected during the summer season at 180 m in mixed deciduous forest.

Genus J sp. A

Fig. 66.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 66.3): Tegumen subtriangular, with arms, narrowed, widened apically, densely scaled apical half, with two distinct, long spiniform setae on each apicolateral margin; uncus small, subtriangular lobe, scaleless; socii indistinct; gnathos arising from apical 1/3 of tegumen length, band-like, widened; anellus closely surrounding basal 1/4 of aedeagus, opening basally; aedeagus short, moderately widened, slightly narrowed to apex; juxta triangular; valva long; sacculus with small group of short setae basally, median with dense spines along ventromedial margin towards neck, dorsal densely setose reaching to neck; neck concaved ventrally, curved and rotated, densely setose; cucullus small, subovate, sparsely spined and setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Aug 2002 (1♂, genitalia slide NP545).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Genus K sp. A

Figs. 23.3, 66.4

Description. *Head*: Lower frons orange white ventrally, mixed with dark brown dorsally, upper frons light brown to brown mixed with dark brown laterally; labial palpus with first segment orange white mixed with dark brown, second segment dark brown mixed with orange white dorsobasally, with light brown strip apically, apical segment dark brown; vertex pale orange mixed with dark brown.

Thorax: Pronotal collar dark brown with white apices; tegulae dark brown intermixed with brown, with orange white apices; mesonotum dark brown with white apices, posterior scales tuft dark brown with white apices. Forewing (Fig. 23.3): Length 5.06 mm in male (n=4); male costal fold present on costa extending from wing base to strigulae 5, termen round; ground color white to orange white intermixed with diffuse dark brown spots; basal fascia distinct on costa between wing base and strigulae 1 extending irregularly to inner margin, dark brown; subbasal fascia distinct on costa between strigulae 2 and 3 extending irregularly to middle of wing, dark brown; median fascia extending from costa between strigulae 4 and 5 to inner margin medially, dark brown mixed with brownish orange 1/3 ventrally, distal margin extending obliquely from costa to R_4, angled and extending irregularly to inner margin, margins mixed with dark brown scales with brownish orange apices, with triangular patch on ventral margin between median and postmedian fascia, brown with white apices mixed with dark brown with brownish orange apices, surrounding with white to orange white scales; postmedian fascia extending obliquely from costa between strigulae 6 and 7 to R_5 near outer margin; ocellus region with irregular dark brown and grey striae, area between ocellus region and outer margin with dark brown strip between M_1 and CuA_2; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with white spots on costa and outer margin between veins. Hindwing brown dorsally, basal half with sparsely dark brown scales, ventrally light brown.

Male genitalia (Fig. 66.4): Tegumen subtriangular, with arms, broaded, moderately dense scales laterally, densely scaled at apex; uncus and socii indistinct; gnathos arising from apical 1/3 of tegumen length, narrowed band-like, slightly sclerotized, fused medially forming plate, weakly sclerotized, connected with anellus posteriorly; anellus surrounding basal of aedeagus, opening dorsally, aedeagus short, widened, between base of tegumen and valva with moderately large lobe, membranous, bearing long, dense scales; sacculus with group of short, dense setae basally, ventral margin with group of long setae connected with patch of dense, moderately long setae along ventral margin towards cucullus basally, median with group of moderately dense, short setae, and group of stout spines and small lobe between basal opening and cucullus basally; cucullus slightly curved, constricted dorsoapically; valva with posteromedial surface concaved, forming elongate groove, with dense scale sockets.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 28 Jul 2002 (1♂, genitalia slide NP542), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂, genitalia slide NP630), 21 Nov 2003 (1♂, genitalia slide NP629), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP579).

Remarks. Specimens were collected throughout the year at 180-1,010 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Genus L sp. A

Figs. 23.4, 92.3

Description. *Head*: Lower frons white to yellowish white, upper frons yellowish white mixed with dark brown with yellowish white apices; labial palpus with first segment white mixed with brownish grey, second segment white intermixed with scattered brownish grey, apical segment white intermixed with brownish grey; vertex brownish grey with white apices.

Thorax: Pronotal collar pale grey with yellowish white apices; tegulae pale grey mixed with grey with yellowish white apices; mesonotum pale grey. Forewing (Fig. 23.4): Length 8.27 mm in female (n=4); termen concave between wing apex and CuA_1; ground color pale yellow to pale orange; costal strigulae yellowish white, strigulae 1-3 indistinct, strigulae 4-9 paired and separated by dark brown; basal wing half with large patch extending from near wing base to strigulae 4 and from costa to inner margin, greyish green, metallic when viewed at angle to light, proximal margin extending obliquely from costa to inner margin, distal margin extending obliquely from costa to R_2, angled and extending to inner margin; strigulae 4 with narrow brown striae extending from costa to inner margin close to distal margin of patch, with white narrow line extending beyond striae between R_2 and inner margin, with metallic light brown patch beyond white line between R_2 and inner margin; postmedian and preterminal fascia present as greyish green spots on costa; apical wing half with dark brown spots near costa at strigulae 7 and near midwing between R and Cu vein; tornus with large, light brown patch between tornus and M_3, wing apex with dark brown spot on fringe scale; outer margin with dark brown line broken by yellowish white strigulae between R_5 and M_1. Underside light brown to brown with yellowish white spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, light brown ventrally.

Female genitalia (Fig. 92.3): Sternum VII with large, sclerotized lobe, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin, anterior area with dense denticulate, especially anterolaterally; tergum VIII moderately dense setae, triangular lateral extensions with sparse setae; papillae anales with posterior surface rather narrowed, moderately widened laterally, densely setose; posterior apophyses distinct, posterior half swollen, forming large, oval-shaped; lamella antevaginalis reduced, lamella postvaginalis forming large patch, densely microtrichiate, extending posteriorly; ostium bursae with anterior margin sclerotized, anteromedial margin with rounded lobe raised up, moderately dense microtrichia laterally, antrum forming large, subovate; ductus bursae flattened, sclerotized, posterior 1/4 with three dentates, with large diverticulum

near posterior end; ductus seminalis arising from posterior end of ductus bursae, corpus bursae with single signum, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°42'63"N 98°23'56"E, 11 Mar 2002 (1♀, genitalia slide NP292), 14°40'03"N 98°36'07"E, 19 Dec 2003 (2♀, genitalia slide NP557, NP558), 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♀, genitalia slide NP559).

Remarks. Specimens were collected during the winter season and the summer season at 180-745 m in mixed deciduous forest and hill evergreen forest.

Genus L sp. B

Figs. 23.5, 92.4

Description. *Head*: Lower frons white, upper frons white mixed with scales laterally, brown with white apices; labial palpus with first segment white, second segment white intermixed with grey to orange grey, apical segment yellowish white intermixed with light brown; vertex brown with yellowish white apices mixed with yellowish white.

Thorax: Pronotal collar orange grey; tegulae yellowish grey to orange grey; mesonotum orange grey with light brown posteriorly. Forewing (Fig. 23.5): Length 8.77 mm in female (n=1); termen concave between wing apex and CuA_1; ground color pale orange; costal strigulae yellowish white, strigulae 1-3 indistinct, strigulae 4-9 paired and separated by dark brown; fasciae indistinct; basal wing half with distinct large patch, light brown to brown, extending from near wing base to strigulae 4 and from costa to inner margin, proximal margin indistinct from costa to inner margin, with sparsely dark brown spots close to proximal margin; distal margin distinct extending obliquely from costa to R_2 and extending to inner margin, deeply inwardly concave near midwing, with some dark brown scales along distal margin, strigulae 4 with narrow yellowish line extending from costa to inner margin beyond distal margin of patch, strigulae 4 with irregular striae, light brown and metallic when viewed at

angle to light, extending from costa enlarged to inner margin beyond patch; tornus with light brown patch, metallic when viewed at angle to light between tornus and M_2; apical wing half with diffuse dark brown spots; outer margin with distinct dark brown line except between M_2 and CuA_1; wing apex with dark brown fringe scales. Underside light brown with yellowish grey spots on costa between veins. Hindwing light brown to brown dorsally, light brown ventrally.

Female genitalia (Fig. 92.4): Sternum VII with large, sclerotized lobe, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin, anterior area indistinct, dense microtrichia; tergum VIII moderately dense setae, triangular lateral extensions with sparse setae; papillae anales densely setose, lateral setae with papillose bases; posterior apophyses distinct, posterior half moderately widened medially; lamella antevaginalis reduced, lamella postvaginalis forming large patch, densely microtrichiate, extending posteriorly; ostium bursae with anterior margin sclerotized, anteromedial margin with rounded lobe raised up, moderately dense microtrichia, antrum forming large, subovate; ductus bursae flattened, widened, sclerotized, with large diverticulum near posterior end; ductus seminalis arising from anterior end of corpus bursae, corpus bursae with single signum, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♀, genitalia slide NP560).

Remarks. Specimen was collected during the winter season at 180 m in mixed deciduous forest.

Genus L sp. C

Figs. 23.6, 67.1

Description. *Head*: Lower frons white to yellowish white, upper frons yellowish white mixed with dark brown with yellowish white apices; labial palpus with first segment white mixed with brownish grey, second segment white intermixed

with scattered brownish grey, apical segment white intermixed with brownish grey; vertex brownish grey with white apices.

Thorax: Pronotal collar pale grey with yellowish white apices; tegulae pale grey mixed with grey with yellowish white apices; mesonotum pale grey. Forewing (Fig. 23.6): Length 7.45 mm in male (n=2); termen concave between wing apex and CuA_1; ground color pale yellow to pale orange; costal strigulae yellowish white, strigulae 1-3 indistinct, strigulae 4-9 paired and separated by dark brown; basal wing half with large patch extending from near wing base to strigulae 4 and from costa to inner margin, greyish green, metallic when viewed at angle to light, proximal margin extending obliquely from costa to inner margin, distal margin extending obliquely from costa to R_2, angled and extending to inner margin; strigulae 4 with narrow brown striae extending from costa to inner margin close to distal margin of patch, with white narrow line extending beyond striae between R_2 and inner margin, with metallic light brown patch beyond white line between R_2 and inner margin; postmedian and preterminal fascia present as greyish green spots on costa; apical wing half with dark brown spots near costa at strigulae 7 and near midwing between R vein and Cu vein; tornus with large, light brown patch between tornus and M_3, wing apex with dark brown spot on fringe scales; outer margin with dark brown line broken by yellowish white strigulae between R_5 and M_1. Underside light brown to brown with yellowish white spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, light brown ventrally.

Male genitalia (Fig. 67.1): Tegumen with arms, narrowed, densely scaled laterally, apex rounded, slightly constricted medially, densely setose; uncus arising from tegumen apically, bifurcated, horn-like, long and slender, slightly curved medially, with short, densely setose, except at apex, basal with long, sparsely setose; socii arising from tegumen lateroapically, horn-like, long, densely setose; gnathos arising from near midlength of tegumen, band-like, narrowed, sclerotized basally; anellus surrounding basal of aedeagus; aedeagus moderately long, with seven cornuti, rather short, apically with two distinct spine-like, moderately long; sacculus with group of dense, short setae basally, median with large group of dense, long setae

between basal opening and ventromedial margin, and group of moderately dense setae between basal opening and dorsal margin, dorsal densely setose; neck rather short, concaved medially, densely setose on dorsal margin; cucullus with ventral surface deeply concaved, anterior part forming large, rounded lobe, extending longitudinally over posterior part, from apex towards neck, densely setose, with dense spines apically, except apical 1/4, posterior part with dense spines, apex with distinct one short, strongly spine, dorsoapical margin constricted, dorsal margin densely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°42'26"N 98°24'37"E, 10 Mar 2002 (1♂, genitalia slide NP282), 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP515).

Remarks. Specimens were collected during the summer season at 250-745 m in mixed deciduous forest and hill evergreen forest.

Genus L sp. D

Figs. 23.7, 67.2

Description. *Head*: Lower frons with pale yellow scales, upper frons with yellowish white mixed with yellowish white basally, light brown apically, with yellowish white at apices; labial palpus with first segment yellowish white, second segment yellowish white mixed with yellowish grey, individual scale with white apices; apical segment yellowish grey mixed with yellowish white; vertex with individual scale yellowish white basally half and brown near apically with yellowish white apices.

Thorax: Pronotal collar with greyish yellow with yellowish white apically; tegulae with greyish yellow scales with yellowish white apically; mesonotum with greyish yellow, posterior tufts absent. Forewing (Fig. 134): length 7.50 mm in male (n=2), male costal fold absent; strigulae yellowish white, ground color brown; costal strigulae 1-4 indistinct, strigulae 5-9 paired and separated by dark brown; basal patched with greyish mixed with brownish orange to light brown intermixed with dark

brown near outer margin, median fascia present as large patch more than 2/3 of wing lengh extending from outer margin of basal patch to strigulae5, costal margin to inner margin, greyish green to yellowish green, metallic yellowish green when viewed at angle to light with narrow long white striae along the outer margin as patched, greyish green spot on costa between strigulae 5 and 6 , 6 and 7 , 7 and 8 and between strigulae 8 and 9; median fascia extending diagonally near costa to inner margin, brownish orange with diffuse black spots, apical half with yellowish white to pale yellow with sparsely spots; ocellus region with brownish orange and diffuse black spots between M_3 and tornus, termen slightly concaved near apex between R_5 and M_3, outer marginal scales dark brown between M_1 to M_3, terminal strigulae present between R_4 and R_5. Underside brown with yellowish white striae on costal margin. Hindwing brown dorsally, inner margin slightly incised with yellowish white long hair, ventrally brown with metallic when viewed at angle to light.

Male genitalia (Fig. 332): Tegumen with arms, moderately broaded, densely scaled laterally; uncus bifurcated, rather short, widened, densely setose, apex rounded, with group of short, densely setose; socii large, arising from base of uncus, moderately large, slightly narrowed to apex, apically rounded, projecting dorsally, densely setose; gnathos arising from apical 1/3 of tegumen, band-like, incompleted, sclerotized basally; anellus surrounding basal of aedeagus; aedaegus moderately long, slightly curved medially; cornuti dense; sacculus with group of dense, short setae basally, median with large group of long, dense setae between basal opening and ventromedial margin, dorsal with long, moderately dense setae; neck slightly concaved, with margins sparsely setose; cucullus large, subovate, dense spines, with sparse setae on margin, ventrobasal area with dense, long and short spines, extending as row, semicircular.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♂, genitalia slide NP73), 14°34'01"N 98°27'28"E, 19 Jun 2002 (1♂, genitalia slide NP361).

Remarks. Specimens were collected during the winter season and the summer season at 780 m in hill evergreen forest.

Genus M sp. A

Figs. 23.8, 92.5

Description. *Head*: Lower frons white to yellowish white, upper frons yellowish white mixed with dark brown with yellowish white apices; labial palpus with first segment white mixed with brownish grey, second segment white intermixed with scattered brownish grey, apical segment white intermixed with brownish grey; vertex brownish grey with white apices.

Thorax: pronotal collar pale grey with yellowish white apices; tegulae pale grey mixed with grey with yellowish white apices; mesonotum pale grey. Forewing (Fig. 23.8): Length 7.45 mm in female (n=1); termen concave between wing apex and CuA_1; ground color pale yellow to pale orange; costal strigulae yellowish white, strigulae 1-3 indistinct, strigulae 4-9 paired and separated by dark brown; basal wing half with large patch extending from near wing base to strigulae 4 and from costa to inner margin, greyish green, metallic when viewed at angle to light, proximal margin extending obliquely from costa to inner margin, distal margin extending obliquely from costa to R_2, angled and extending to inner margin; strigulae 4 with narrow brown striae extending from costa to inner margin close to distal margin of patch, with white narrow line extending beyond striae between R_2 and inner margin, with metallic light brown patch beyond white line between R_2 and inner margin; postmedian and preterminal fascia present as greyish green spots on costa; apical wing half with dark brown spots near costa at strigulae 7 and near midwing between R and Cu vein; tornus with large, light brown patch between tornus and M_3, wing apex with dark brown spot on fringe scale; outer margin with dark brown line broken by yellowish white strigulae between R_5 and M_1. Underside light brown to brown with yellowish white spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, light brown ventrally.

Female genitalia (Fig. 92.5): Sternum VII with large, sclerotized plate, roughly surface by short, dense denticulate throughout, densely scaled, becoming more dense towards posterior margin, posterior margin deeply concaved medially, anterior margin widened, forming distinct folded lobe; tergum VIII and triangular lateral extensions sparsely setose; papillae anales rather narrowed, densely setose, without papillose bases; anterior apophyses long, narrowed; lamella antevaginalis reduced, lamella postvaginalis forming sclerotized plate, fused with sternum VII laterally, without setae; ostium bursae with anterior margin sclerotized, sinuated, slightly incised medially, antrum forming large, oval-shaped; ductus seminalis arising from anterior end of corpus bursae; corpus bursae with two unequal signa, short, spine-like, basal dilated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♀, genitalia slide NP562).

Remarks. Specimen was collected during the winter season at 742 m in hill evergreen forest.

Genus N sp. A

Fig. 67.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 67.3): Tegumen subrectangular, with arms, moderately broad, apically widened, basolateral half densely scaled, apical half with group of moderately dense setae sockets apicolaterally, and group of dense, long setae, located on inner surface of tegumen apicolaterally; uncus and socii absent; gnathos arising from near midlength of tegumen, narrowed, completed band-like; anellus closely surrounding basal 1/3 of aedeagus; aedeagus rather short, basally widened, narrowed to apex; cornuti dense; sacculus with short and long, moderately dense setae along ventral area; median with group of short, moderately setose near basal opening, dorsal with short, sparsely setose; neck moderately long, deeply incised ventrally, curved;

cucullus rather small, subovate, rotated, with dense, long and short spines, outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 28 Sep 2002 (1♂, genitalia slide NP459).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Genus O sp. A

Figs. 24.1, 92.6

Description. *Head*: Lower frons and upper frons yellowish white; labial palpus with first segment light brown, second segment brown basal half, apical half light orange with metallic greyish green apically, apical segment pale orange; vertex light brown mixed with orange white.

Thorax: Pronotal collar brownish orange; tegulae brownish orange, paler basally; mesonotum brownish orange mixed with light brown. Forewing (Fig. 24.1): Length 6.72 mm in female (n=1); costal margin slightly curved medially, termen concaved between R_5 and M_3; ground color orange grey; costal strigulae orange white, strigulae 1-4 and 8-9 singled, strigulae 5-7 paired and separated by dark brown; fasciae reduced, inner margin basally with diffuse transverse dark brown line, costal margin with distinct, small subtriangular patch, dark brown surrounding strigulae 5; postmedian fascia present as dark brown spot on costa; wing apex brown; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Female genitalia (Fig. 92.6): Sternum VII with moderately large, sclerotized plate, densely scaled, posterior margin concaved medially; tergum VIII densely microtrichiate posteriorly, triangular lateral extensions densely scaled and

microtrichiate; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis laterally, forming large, sclerotized plate, surrounding ostium bursae, dense microtrichia and scales, anterior margin connected with posterior margin of sternum VII, posterior margin sinuated, pointed medially; ostium bursae subovate, margin densely microtrichiate except ventral margin; ductus bursae with small, sclerotized plate near ostium bursae; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae with large patch, scobinated, extending obliquely.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'41"N 98°24'12"E, 6 Feb 2002 (1♀, genitalia slide NP193).

Remarks. Specimen was collected during the winter season at 1,020 m in hill evergreen forest.

Genus P sp. A

Fig. 93.1

Description. Wing pattern poorly defined.

Female genitalia (Fig. 93.1): Sternum VII with moderately large, sclerotized plate, densely scaled, sparsely setose posterolaterally, anterior margin with sclerotized, narrowed ridge, posterolateral corner with sclerotized lobe, posteromedial area wrinkled; tergum VIII densely microtrichiate, triangular lateral extensions with dense scales and microtrichia; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis with large patch of dense microtrichia; ostium bursae covered by sternum VII, antrum forming cup-shaped; ductus bursae with large, sclerotized plate, long, located middle of ductus bursae; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two, moderately long, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (1♀, genitalia slide NP253).

Remarks. Specimen was collected during the summer season at 220 m in mixed deciduous forest.

Genus Q sp. A

Figs. 24.3, 67.4, 93.2

Description. *Head*: Lower frons and upper frons yellowish white; labial palpus with first segment brown, second segment brown with yellowish white at apex, apical segment yellowish white; vertex brown mixed with yellowish white.

Thorax: Pronotal collar light brown; tegulae brown mixed with dark brown, some scales with yellowish white apices; mesonotum dark brown, some scales with yellowish white apices. Forewing (Fig. 24.3): Length 4.18 mm in male (n=3), 4.27 mm in female (n=1); male costal fold absent, termen rounded; ground color yellowish white; costal strigulae white, strigulae 1-4 and 7-9 paired and separated by dark brown, strigulae 5-6 singled; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, brown mixed with dark brown, with diffuse white scales; median fascia indistinct, extending obliquely from costa to inner margin near tornus, light brown to brown, separated by ground color medially, with small dark brown spot at apical end of discal cell; postmedian and preterminal fascia present as dark brown spot on costa; wing apex brownish orange, with small dark brown patch, cresent-shaped near outer margin between R_4 and M_1; outer margin with distinct dark brown line, broken by yellowish white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing light brown dorsally and ventrally.

Male genitalia (Fig. 67.4): Tegumen rectangular, with arms, moderately broaded, densely scaled laterally; uncus bifurcated, each arising from tegumen apicolaterally, rather narrowed, tubular-like, without setae; socii small, subtriangular,

arising from apicolateral 1/4 of tegumen, densely setose; gnathos arising from midlength of tegumen, completed band-like, sclerotized; anellus closely base of aedeagus; aedeagus rather short, basal half widened, slightly narrowed to apex; cornuti present as two sockets; valva long, narrowed medially, forming neck, sparsely setose; sacculus with group of dense, moderately long setae basally, ventral margin sparsely setose, median with large group of dense, long spiniform setae between basal opening and neck, dorsal sparsely setose; cucullus large, subovate, dense spines, outer margin sparsely setose, ventrobasally with small triangular lobe, pointed ventrally.

Female genitalia (Fig. 93.2): Sternum VII with moderately large, sclerotized plate, densely scaled, becoming more dense towards posterior margin, posterior margin concaved medially, anterior 1/3 with membranous folded, forming narrowed ridge, curved upward medially; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced; lamella postvaginalis forming sclerotized transverse ridge, moderately long, dense microtrichia, membrane between sternum VII and VIII with two distinct, long setae near lamella postvaginalis posterolaterally; ostium bursae with anterior margin smooth, posterior margin fused with lamella postvaginalis; ductus seminalis arising from midlength of ductus bursae; corpus bursae with single, small, spine-like signum.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 6 Nov 2002 (1♀, genitalia slide NP491), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂), 14°41'43"N 98°37'34"E, 22 Oct 2003 (2♂, genitalia slide NP622).

Remarks. Specimen was collected throughout the year at 180-1,010 m in mixed deciduous forest and hill evergreen forest.

Genus R sp. A

Figs. 24.4, 93.3

Description. *Head*: Lower frons light brown, upper frons dark brown mixed with brownish orange; labial palpus with first segment light brown, second segment light brown becoming darker to dark brown apically, apical segment dark brown; vertex brownish orange with dark brown scales laterally.

Thorax: Pronotal collar brown to dark brown; tegulae dark brown; mesonotum dark brown mixed with light brown. Forewing (Fig. 24.4): Length 3.50 mm in female (n=1); termen slightly concaved between wing apex and M_3; ground color orange grey; costal strigulae orange white, strigulae 1-2 indistinct, strigulae 3-4 paired and separated by dark brown, strigulae 5-9 singled, strigulae 8 absent, ventral half of wing with irregular, transverse narrowed lines, dark brown; basal and subbasal fascia indistinct; median fascia present as brown mixed with dark brown patch extending oblique irregularly from costa to midwing; postmedian fascia with distinct small dark brown spot on costa, area between strigulae 7 and 9 with moderately large subtriangular spot on costa; pretornal present as irregular dark brown spot on inner margin; ocellus region with dark brown dashes between M_1 and tornus with transverse narrowed grey line extending from M_1 to inner margin; outer margin with white strigulae between R_5 and M_1. Underside light brown with orange white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 93.3): Sternum VII with sclerotized plate, rather small, subtriangular, narrowed to posteriorly, wrinkled, except anteromedially, lateral and posterior margin extending cover membrane, anterior margin concaved medially, moderately dense scales, becoming more dense towards posterior margin; tergum VIII and triangular lateral extensions sparsely setose; papillae anales narrowed, densely setose, without papillose bases; lamella antevaginalis and postvaginalis reduced; ostium bursae covered by sternum VII; ductus bursae with anterior 1/3 sclerotized, middle with small, sclerotized plate, with inception of ductus seminalis; corpus bursae constricted medially, with two large, curved, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 25 Oct 2003 (1♀, genitalia slide NP659).

Remarks. Specimen was collected during the late of rainy season at 195 m in mixed deciduous forest.

Genus S sp. A

Figs. 24.5, 68.1

Description. *Head*: Lower frons and upper frons greyish white; labial palpus with first segment dark brown, second segment dark brown with white at apex, apical segment dark brown, white at apex; vertex light brown mixed with brown.

Thorax: Pronotal collar brown; tegulae brown mixed with dark brown, with yellowish white apices; mesonotum dark brown. Forewing (Fig. 24.5): Length 4.09 mm in male (n=1); male costal fold present between wing base and strigulae 3, termen rounded; ground color light brown; costal strigulae yellowish white, strigulae 1-2 indistinct, strigulae 3-8 paired and separated by dark brown, strigulae 9 singled; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, brown with diffuse dark brown spots and orange grey strip on distal margin; median fascia extending obliquely from costa to inner margin, with orange grey strip on margins, interfascia between strigulae 7 and 8 with dark brown narrowed striae extending obliquely from costa to tornus; preterminal fascia distinct extending obliquely from costa to outer margin between M_2 and M_3; wing apex with narrowed greyish orange line extending curved from costa to outer margin at between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 68.1): Tegumen subtriangular, with arms, moderately broaded, densely scaled laterally; uncus subovate, moderately large, with dense, very long setae laterally; socii forming long patch, arising from tegumen apicolaterally, pendant to near half of tegumen, curved apically, apex pointed, densely setose;

gnathos arising from near midlength of tegumen, completed band-like, widened, extending dorsally; anellus cup-like, surrounding middle of aedeagus; aedeagus short, widened, slightly narrowed to apex; cornuti dense, long; valva curved upward medially, with distinct, sparsely scaled, long spatulate-shaped, throughout basal half; apical half densely setose; sacculus sparsely setose dorsally; neck long, widened; cucullus large, suboval-shaped, with distinct small, narrowed, tubular lobe ventrobasally, with spine at apex, projecting dorsally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 25 Oct 2003 (1♂, genitalia slide NP663).

Remarks. Specimen was collected during the late of rainy season at 195 m in mixed deciduous forest.

TRIBE GRAPHOLITINI

Acanthoclita Diakonoff, 1982

Acanthoclita Diakonoff, 1982, Zool. Verh. Leiden 193: 27. Type species: *Eucosma balanoptycha* Meyrick, 1910.

Acanthoclita has been defined by the following characters; rather narrow-winged, with dense, fine strigulation along entire costa and a dark roundish spot in apex between two white strigulae, and with the hindwing usually translucent towards bases and in male with modified scales on anal area above and/or below. The genus has large, porrect, strongly sinuate labial palpi, with the second segment distally widened by long scales. The male genitalia are diagnostic, with a very broad, short vinculum and a weakly sclerotized tegumen with the base of gnathos arms often conspicuously fused with the tegumen, with long and very slender valvae with the cucullus crescent-shaped and often upcurved and, in addition to a band of spines along its ventral margin, nearly always with a single strong spine at its base. The juxta is subtriangular, dorsoventrally compressed, the band-shaped caulis curved and very

long, and the long, curved or bent aedeagus has a sheaf of lanceolate deciduous cornuti and a more distal series of spiniform, fixed cornuti. The female genitalia are quite characteristic in the derived species with a complex sterigma surrounding the ostium and fused with the sclerotized, funnel-shaped end of the ductus bursae, but the simple transverse sclerite behind the ostium with a patch of modified scales on each side found in less derived species. The ductus bursa is membranous or variably sclerotized, with the origin of the ductus seminalis variable, and the ovate corpus bursae has two usually curved and blade-shaped, distally pointed signa (Diakonoff, 1982; Kuznetsov, 1987). The genus includes 7 species worldwide. *Acanthoclita* includes 5 species have been described from the Oriental region (Brown, 2005). Fletcher (1932) reported that *A. conciliate* feeding on flowers, leaves and shoots of *Butea frondosa*, sometimes with the base of the flowers and the shoot partially bored. Clarke (1976) stated that *Pongamia glaba* and *Derris elliptica* as hostplants for *A. defensa.*

Acanthoclita balanoptycha (Meyrick), 1910

Figs. 24.6, 68.2, 68.3, 93.4

Eucosma balanoptycha Meyrick, 1910, Rec. Indian Mus. 5: 218. Type locality: India. Syntypes (♂, ♀): ZSIK.

Description. *Head*: Lower frons orange white, upper frons light brown to brown; labial palpus with first segment light brown to brown, second segment light brown to brown mixed with dark brown dorsobasally and dorsoapically, apical segment brown to dark brown; vertex light brown to brown.

Thorax: Pronotal collar brown; tegulae brown, each scales with pale orange apices; mesonotum brown mixed with dark brown, each scales with pale orange apices. Forewing (Fig. 24.6): Length 4.90 mm in male (n=1), 4.97 mm in female (n=2); male costal fold absent, termen concaved between R_5 and M_3; ground color light brown to brown with pale orange apices; costal strigulae white to orange white, strigulae 1 and 2 indistinct, strigulae 3-9 paired and separated by dark brown; fasciae

poorly defined, scales in area of basal patch becoming darker along proximal margin of interfascial strip, brown mixed with dark brown; median fascia indistinct slightly darker brown, with dark brown scales forming pretornal subtriangular spot, with subtriangular spot on inner margin between basal patch and median fascial area, brownish orange to light brown; postmedian fascia extending obliquely as continue small spots, dark brown from costa to R_5; ocellus region with 4 dark brown dashes between M_1 and CuA_2, surrounding with pale orange scales; wing apex brown to dark brown; outer margin with distinct dark brown line, broken by orange white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 68.3): Sternum VIII with coremata containing a group of dense, long scale tufts on posterolateral margin, each scale with apex rounded.

Male genitalia (Fig. 68.2): Tegumen with arms moderately broad basal 2/3, apical 1/3 narrowed, scaleless; uncus and socii absent; gnathos arising from near midlength of tegumen, band-like, rather narrowed, sclerotized; caulis long; anellus closely surrounding near half of aedeagus length; aedeagus long and slender, slightly narrowed to apex, strongly curved medially, cornuti dense; sacculus with group of moderately long setae basally, ventral margin with row of sparse setae towards neck, median with small group of short, sparse setae near basal opening, neck long, sparsely setose; cucullus, subovate, sparsely setose, with dense long and short spines ventral half, basal with two distinct strongly spines.

Female genitalia (Fig. 93.4): Sternum VII with large sclerotized plate, densely scaled; tergum VIII sparsely scaled, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming moderately large sclerotized plate, posterolaterally raised up as lobe with dense scales; ostium bursae with anterior margin raised up, rounded, smooth, antrum forming cup-shaped; ductus bursae with

sclerotized plate beyond antrum anterior 1/3; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two long signa, curved, rounded at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♀, genitalia slide NP739), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP618), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP638).

Distribution. Thailand (new record), Ceylon, India, Southern Mariana Is. and Caroline Is.

Remarks. Specimens were collected during the winter season at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Acanthoclita balia Diakonoff, 1982

Figs. 24.7, 93.5

Acanthoclita balia Diakonoff, 1982, Zool. Verh. Leiden 193: 30. Type locality: Sri Lanka (Ratnapura District, Uggalkaltota). Holotype (♀): USNM.

Description. *Head*: Lower frons orange white, upper frons dark brown; labial palpus with first segment brown mixed with dark brown, second segment dark brown mixed with brown, with light brown apically, apical segment brown to dark brown; vertex light brown to dark brown with orange white apices.

Thorax: Pronotal collar dark brown; tegulae dark brown with orange white apices; mesonotum dark brown with orange white apices. Forewing (Fig. 24.7): Length 6.20 mm in female (n=2); termen slightly concaved between R_5 and M_2; ground color orange white to pale orange; costal strigulae white, strigulae 1-9 paired and separated by dark brown; basal patch extending from costa between wing base and strigulae 3 to 1A+2A, dark brown, some scales with white apices; median fascia

extending obliquely from costa between strigulae 4 and 5 to R_3, angled and extending oblique inwardly to 1A+2A, dark brown and some scales with white apices, surrounding with brown scales; postmedian fascia extending obliquely irregularly from costa between strigulae 6 and 7 to outer margin, dark brown separated by pale orange, strigulae 8 with grey striae extending obliquely to outer margin at R_5; ocellus region with patch between R_5 and M_3, brown with some scales white apices, mixed with short, longitudinal narrow strip between R_5 and CuA_2; outer margin with distinct dark brown striae, broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 93.5): Sternum VII moderately large sclerotized plate, posterior margin concaved medially, densely scaled, becoming more dense towards posterolateral corners, anteromedially without scales, medially with narrowed, sclerotized ridge, oblique, V-shaped, disconnected ventrally, anteromedially with small, sclerotized plate at end of ridge; tergum VIII sparsely setose posteriorly, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming two large patch of dense scales; ostium bursae with membranous margin, opening near sternum VII margin; ductus bursae with sclerotized, irregular plate, encircled anteriorly 1/3, narrowed to anterior end, with sclerotized, rounded knob laterally; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with large sclerotized, irregular plate near anterior end, with two blade-like signa, dilated basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Jan 2004 (1♀, genitalia slide NP603), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP604).

Distribution. Thailand (new record) and Sri Lanka.

Remarks. Specimens were collected during the winter season at 195-745 m in mixed deciduous forest and hill evergreen forest.

Unplaced *Acanthoclita*

Acanthoclita sp. A

Figs. 24.8, 68.4, 68.5

Description. Head: Lower frons yellowish white, upper frons greyish orange ; labial palpus with first segment brown with yellowish white dorsally, second segment light brown mixed with brown, apical segment light brown; vertex light brown mixed with brown.

Thorax: Pronotal collar brown; tegulae light brown mixed with brown; mesonotum light brown intermixed with brown. Forewing (Fig. 24.8): Length 4.77 mm in male (n=1); male costal fold absent, termen slightly concave between wing apex and M_2, ground color yellowish white to yellowish grey; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal fascia present as irregular strip, brown mixed with dark brown extending from wing base to strigulae 1 and from costa to inner margin; subbasal fascia indistinct present as small spot, dark brown on costa; median fascia incompleted separated, broken by ground color present as small spots, dark brown on costa, two dark brown spots on midwing, one in discal cell, the other between base of M_1 and M_2, and subtriangular pretornal spot, brown extending from inner margin to M_2; postmedian fascia distinct extending obliquely from costa to M_1, dark brown, between strigulae 7 and 8 with striae extending obliquely from costa to outer margin at M_1, dark brown, R_5 and M_1 dark brown; ocellus region with irregular dark brown line extending from R_5 to tornus; outer margin with distinct dark brown strip broken by yellowish white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 68.5): Sternum VIII with coremata containing a group of dense, long scale tufts on posterolateral margin, each scale with apex pointed.

Male genitalia (Fig. 68.4): Tegumen subtriangular, with arms moderately broad, top emarginated, scaleless; uncus and socii absent; gnathos arising from near basal 1/4 of tegumen, narrowed band-like, sclerotized basally; anellus closely surrounding near half of aedeagus length; aedeagus long and slender, curved medially; cornuti dense, short, located middle of aedeagus; vesica with group of dense spiculate; sacculus with small group of short, 4-5 setae basally, ventromedially with two setae, moderately long, medial area close to dorsal with group of sparse setae; neck slightly concaved ventrally, without setae; cucullus semicircular-like, sparsely setose, dense spines near outer margin, moderately long, outer margin with row of short, stout spines and sparse setae; valva with sclerotized band dorsoposterior surface.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂, genitalia slide NP418).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Acanthoclita sp. B

Figs. 25.1, 93.6

Description. *Head*: Lower frons yellowish white, upper frons light brown; labial palpus with first segment brown mixed with dark brown, second segment brown with dark brown spot basally, dorsomedially, apical segment light brown; vertex light brown to brown.

Thorax: Pronotal collar brown; tegulae brown with greyish yellow apices; mesonotum light brown to brown with greyish yellow apices. Forewing (Fig. 25.1): Length 4.88 mm in female (n=2); termen round; ground color light brown; costal strigulae yellowish white, strigulae 1-4 two paired and separated by dark brown,

strigulae 5-7 paired and separated by dark brown, strigulae 8 and 9 singled, basal fascia indistinct; subbasal fascia extending irregularly from costa to inner margin, brown mixed with dark brown; median fascia distinct extending obliquely from costa to inner margin near tornus, brown mixed with dark brown, with dark brown spot beyond median fascia between base to M_1 and M_3; postmedian fascia extending irregularly from costa to outer margin at between R_5 and M_1, wing apex brown mixed with dark brown, strigulae 9 connected with terminal strigulae between R_5 and M_1, yellowish white; ocellus region with silvery grey striae between R_5 and CuA_2 with brown striae containing indistinct dark brown dashes between R_5 and tornus, with yellowish strigulae transverse line near outer margin extending from M_1 to outer margin between CuA_1 and CuA_2 , and from CuA_2 to tornus. Underside light brown to brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally, with area between CuA_2 and 1A+ 2A basally without scales.

Female genitalia (Fig. 93.6): Sternum VII with large sclerotized plate, densely scaled, posterior margin concaved medially, anterolateral area constricted; tergum VIII without scales or setae, triangular lateral extensions moderately dense scales posteriorly; papillae anales densely setose, lateral setae with papillose bases; sterigma developed; lamella antevaginalis fused with lamella postvaginalis laterally, forming large, sclerotized plate, subsemicircular, with dense microtrichia and scales on lamella postvaginalis; ostium bursae present on sterigma plate medially, antrum forming a moderately wide, cup-shaped; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 14 May 2002 (1♀, genitalia slide NP423), 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP748).

Remarks. Specimens were collected during the summer season at 255-745 m in dry evergreen forest and hill evergreen forest.

Acanthoclita sp. C

Figs. 25.2, 69.1, 69.2

Description. *Head*: Lower frons yellowish white, upper frons orange grey to greyish orange; labial palpus with first segment yellowish white, second segment orange grey, apical segment orange grey; vertex light brown.

Thorax: Protonal collar light brown; tegulae brown with orange white apices; mesonotum light brown mixed with brown. Forewing (Fig. 25.2): Length 4.67 mm in male (n=4); male costal fold absent, termen slightly concaved between wing apex and M_3, ground color light brown; costal strigulae yellowish white, strigulae 1 and 2 indistinct, strigulae 3-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal and subbasal fascia indistinct suffused with ground color; median fascia indistinct extending irregularly from costa to M-stem, brown to dark brown; interfascia between strigulae 5 and 6 with dark brown striae extending obliquely from costa to M_1; postmedian fascia present as row of dark brown spots extending obliquely from costa to tornus, surrounding with orange grey scales in ocellus region; outer margin with dark brown striae broken by yellowish white strigulae between R_4 and R_5. Underside light brown with yellowish grey spots on costa margin between veins. Hindwing light brown to brown dorsally, light brown ventrally.

Abdomen (Fig. 69.2): Sternum VIII with coremata containing a group of dense, long scale tufts on posterolateral margin, each scale with apex rounded.

Male genitalia (Fig. 69.1): Tegumen subtriangular, rather narrowed, apex pointed, scaleless; uncus and socii absent; gnathos arising from basal 1/3 of tegumen length, narrowed band-like, sclerotized; caulis long; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long and slender, slightly narrowed to apex, curved medially; cornuti dense; valva long, with dorsal and ventral margin paralleled over basal half; curved upwardly near apically; sacculus with group of dense, moderately long setae basally, ventral margin with sparse setae towards neck, median with group of sparse setae, dorsal sparsely setose; neck long, sparsely setose; cucullus subovate,

sparsely setose, dense short and long spines on ventral marginal area, apex with distinct single short, strongly spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'39"N 98°24'10"E, 8 Mar 2002 (1♂, genitalia slide NP276), 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP538), 14°38'02"N 98°31'40"E, 20 Nov 2003 (2♂, genitalia slide NP664).

Remarks. Specimens were collected throughout the year at 195-1,020 m in mixed deciduous forest and hill evergreen forest.

Acanthoclita sp. D

Figs. 25.3, 69.3, 69.4

Description. *Head*: Lower frons light brown mixed with brown, upper frons light brown; labial palpus with first segment greyish yellow mixed with light brown, second segment greyish orange with light brown medially and apically, apical segment light brown to brown, vertex brown orange to light brown.

Thorax: Pronotal collar brown; tegulae brown; mesonotum brown to dark brown. Forewing (Fig. 25.3): Length 4.68 mm in male (n=3); male costal fold absent, termen rather round; ground color light brown intermixed with greyish yellow; costal strigulae yellowish white, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled, basal fascia suffused with ground color, subbasal fascia present indistinct extending from costa to inner margin, curved outward medially, brown to dark brown; median fascia distinct on costa, incompleted extending obliquely from costa to R vein, dark brown; interfascia between strigulae 5 and 6 with dark brown striae extending obliguely from costo R_5; postmedian fascia distinct on costa extending obliquely from costa to R_5; ocellus region with brownish grey patch on tornus with row of dark brown spots between R_5 and CuA_2; outer margin with dark brown strip broken by yellowish white strigulae between R_5 and M_1, light brown with yellowish white to yellowish grey spots on costa and outer margin between veins.

Hindwing brown dorsally with anal margin forming sclerotized containing with yellowish white scales, light brown ventrally, area between metethorax and first abdominal segment with grey of dense hair-scales.

Abdomen (Fig. 69.4): Sternum VIII with coremata containing a group of short scale-tufts, spantulate-shaped and a group of long, narrowed scale-tufts on posterolateral margin.

Male genitalia (Fig. 69.3): Tegumen subtriangular, with arms, broaded, apex concaved forming dorsoposterior and dorsoanterior lobe, scaleless; uncus and socii absent; gnathos arising from basal 1/3 to basal 1/4 of tegumen length, band-like, sclerotized basally; caulis long; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long and slender, slightly narrowed to apex, slightly sinuated; cornuti dense; valva long, dorsal and ventral margin paralleled over basal half, apically widened; sacculus with small group of short setae basally, median with sparse setae between basal opening and neck, dorsal sparsely setose; neck long without setae; cucullus subsemicircular, sparsely setose, with moderately dense, long and short spines along ventral margin, apex with distinct one spine, strongly sclerotized.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (1♂, genitalia slide NP256), 14°41'43"N 98°27'34"E, 22 Oct 2003 (1♂, genitalia slide NP711), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP707).

Remarks. Specimens were collected throughout the year at 220-1,040 m in mixed deciduous forest and hill evergreen forest.

Acanthoclita sp. E

Fig. 94.1

Description. Wing pattern poorly defined.

Female genitalia (Fig. 94.1): Sternum VII with large sclerotized plate, densely scaled, becoming more dense towards posterior margin, posterior margin concaved medially; tergum VIII without scales or setae, triangular lateral extensions with moderately dense scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis forming sclerotized band, fused with lamella postvaginalis laterally, which forming moderately large, sclerotized plate, with dense scales and sparse setae posterolaterally; ostium bursae small, membranous margin, antrum small cup-like, ductus bursae with sclerotized small sclerotized plate anterior 1/4; ductus seminalis arising from near midlength of ductus bursae; corpus bursae with two blade-like signa, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Nov 2003 (1♀, genitalia slide NP665), 14°41'43"N 98°27'34"E, 21 Dec 2003 (1♀, genitalia slide NP577).

Remarks. Specimens were collected during the winter season at 180-745 m in mixed deciduous forest and hill evergreen forest.

Acanthoclita sp. F

Figs. 69.5, 69.6

Description. Wing pattern poorly defined.

Abdomen (Fig. 69.6): Sternum VIII with coremata containing a group of dense, long scale tufts on posterolateral margin, each scale with pointed apex.

Male genitalia (Fig. 69.5): Tegumen subtriangular, with broaded arms, apex concaved forming dorsoanterior and dorsoposterior lobe, scaleless; uncus and socii absent; gnathos arising from basal 1/3 of tegumen length, band-like, sclerotized; caulis long; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long and slender, slightly narrowed to apex, curved medially; cornuti dense; sacculus with short, single setae basally, ventromedial margin with two short setae, median with three short setae

between basal opening and neck, dorsal with single short setae; neck long, slightly concaved, dorsal and ventral margin sclerotized, without setae; cucullus subovate, elongate, curved upwardly, sparsely setose, with row of short, 4-5 strongly spines along near outer margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'35"N 98°24'19"E, 21 Nov 2003 (1 ♂, genitalia slide NP499).

Remarks. Specimen was collected during the rainy season at 956 m in hill evergreen forest.

Andrioplecta Obraztsov, 1968

Andrioplecta Obraztsov, 1968, J. New York Ent. Soc. 76: 176. Type species: *Laspeyresia pulverula* Meyrick, 1912.

Andrioplecta can be recognized by the forewing with an oblique dark fuscous submedian patch, without ocelloid patch, and with distally curved CuA_2, by the hindwing with R_1 arising from 1/2-2/3 of cell in both sexes, without Rs in male, and with the hair-pencil near the base of 3A and the dorsal fold in male, by the male with the coremata, and by the female having the corpus bursae with a large membranous sac (bulla seminalis) originating from its posteroventral wall (Komai, 1999; Obraztsov, 1968). The genus is mainly distributed in the tropical and subtropical zones in Asia. The genus includes 10 species worldwide and 7 species have been described from Southeast Asia (Brown, 2005). Dipterocarpaceae are utilized as larval hosts by three related species, *A.* subpulverula, *A. shoreae* and *A. dierli* (Komai, 1992, 1999).

Andrioplecta dierli Komai, 1992

Fig. 94.2

Andrioplecta dierli Komai, 1992, Tyô to Ga 43: 178. Type locality: Nepal (Kathmandu Valley, Godavari). Holotype (♂): ZSM.

Description. Wing pattern poorly defined.

Female genitalia (Fig. 94.2): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled; tergum VIII moderately dense scales posteriorly, except posteromedially, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming rounded lobe, semicircular, densely microtrichiate and scaled; ostium bursae covered by sternum VII, antrum forming a small cup; ductus bursae with anterior half moderately widened, with large sclerotized plate, long 1/3 of ductus bursae length, posterior half widened; ductus seminalis widened, arising from midlength of ductus bursae; corpus bursae with two, moderately long, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Dec 2003 (1♀, genitalia slide NP662).

Distribution. Thailand (new record), Nepal and Northern India.

Remarks. Specimen was collected during the winter season at 195 m in mixed deciduous forest.

Andrioplecta shoreae Komai, 1992
Figs. 25.4, 70.1, 94.3

Andrioplecta shoreae Komai, 1992, Tyô to Ga 43: 173. Type locality: Borneo (Sabah, Sandakan). Holotype (♂): OPU.

Description. *Head*: Lower frons yellowish white, upper frons greyish orange mixed with light brown; labial palpus with first segment yellowish white, second segment yellowish white, apical segment yellowish white; vertex dark brown with greyish orange apices.

Thorax: Pronotal collar dark brown with orange white apices; tegulae brown to dark brown with orange white apices; mesonotum dark brown with orange white apices mixed with brown with orange white apices anterior 1/4. Forewing (Fig. 25.4): Length 5.77 mm in male (n=1), 6.12 mm in female (n=5); male costa fold absent, termen straight; ground color light brown to brown with orange white apices; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal patch present as dark brown strip extending obliquely from inner margin basal 1/3 to R vein, dark brown; median fascia extending obliquely to R_4, angled and extending to inner margin, dark brown, proximal margin with dense orange white scales, interfascia between strigulae 5 and 6 with dark brown narrow strip, extending distinct obliquely from R_2 to outer margin between M_3 and CuA_1, brown strip beyond dark brown narrow strip extending from costa to outer margin, strigulae 8 and 9 enlarge distinct; ocellus region brown to dark brown between R_5 and inner margin intermixed with greyish orange spots forming indistinct strip extending curve from R_4 to outer margin near tornus, with yellowish white narrow strip between M_1 and CuA_1, near outer margin with small dark brown spot near outer margin between CuA_1 and CuA_2; outer margin with distinct dark brown line, terminal strigulae absent. Underside light brown with yellowish white spots on costa. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 70.1): Tegumen narrowed, without scales or satae, rounded apically; uncus and socii absent; gnathos arising from dorsal 1/3 of tegumen, weakly sclerotized, band-like; anellus surrounding basal of aedeagus; aedeagus long, slender, curved medially, with dense cornuti at apical 1/3 of aedeagus; juxta triangular; sacculus with group of dense, moderately long setae basally and along ventral margin towards neck, posterobasal area with dense microtrichia, median with group of dense, long setae between basal opening and neck, dorsal with sparse setae towards cucullus; neck short, concave ventrally, sparse setae on dorsal margin; cucullus broad, semiovate, apex rounded, dense long spines, gradually short outside, ventral margin with row of moderately dense short setae.

Female genitalia (Fig. 94.3): Sternum VII rather small, moderately sclerotized, posterior margin concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII moderately dense scales posteriorly extending to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; ostium bursae behind sternum VII; lamella postvaginalis forming small patch, kidney-shaped, moderately sclerotized, densely scaled; ductus bursae widened, anterior 1/3 narrowed, with sclerotized plate weakly twisted; ductus seminalis wide, arising from midlength of ductus bursae; corpus bursae with two horn-shaped signa on basal rounded plate.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP416), 11 Jun 2002 (2♀, genitalia slide NP478, NP747), 14°41'32"N 98°24'17"E, 13 Jun 2002 (1♂, genitalia slide NP446, 2♀).

Distribution. Thailand, Malaysia, Borneo and Philippine Is.

Remarks. Specimens were collected during the summer season at 960-745 m in hill evergreen forest.

Andrioplecta subpulverula (Obraztsov), 1968
Figs. 25.5, 70.1, 94.3

Laspeyresia subpulverula Obraztsov, 1968, J. New York Ent. Soc. 76: 177. Type locality: Indonesia (Java, Lawang). Holotype (♀): BMNH.

Description. *Head*: Lower frons yellowish white, upper frons yellowish grey; labial palpus with first segment yellowish white, second segment yellowish white, apical segment yellowish white; vertex dark brown with yellowish white apices.

Thorax: Tegulae dark brown with yellowish white apices; mesonotum dark brown with yellowish white apices. Forewing (Fig. 25.5): Length 5.68 mm in male

(n=3), 6.86 mm in female (n=1); male costal fold absent; termen slightly concave; ground color light brown intermixed with diffuse yellowish white spots; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown, basal patch present as irregular patch extending from wing base to trigulae 3 and costal to inner margin, brown to dark brown intermixed with yellowish white, becoming darker to dark brown on distal margin; median fascia extending irregularly from costa to inner margin, brown to dark brown, interfascia between strigulae 5 and 6 with dark brown narrowed strip, extending curved form costa to outer margin at CuA_1, surrounding with brown scales, strigulae 7 with grey striae extending from costa to outer margin at M_1, strigulae 8 and 9 enlarged; ocellus region with large patch brown to dark brown intermixed with yellowish white spots between R_2 and inner margin, outer margin with strip, yellowish white extending from CuA_2 to M_1; outer margin with distinct dark brown line; terminal strigulae absent. Underside light brown with yellowish white spots on costa. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 70.2): Tegumen narrowed, concaved near apex, without scales or setae; uncus and socii absent; gnathos widened, band-like, slightly sclerotized, arising from dorsal 1/3 of tegumen; anellus closely surrounding basal 1/5 of aedeagus; aedeagus long and wide, straight, apical 1/3 slightly tapered to apex; cornuti absent; valva deeply concaved ventrally forming neck; sacculus with small group of dense setae basally, along ventral margin with sparse setae, posterior surface with sparsely setose basally, median with moderately dense setae mixed with short spiniform setae between basal opening and neck, dorsal with sparsely setose towards cucullus; neck with short, sparse spiniform setae towards cucullus ventrally; cucullus subrectangular, rounded at apex, with long and dense spiniform setae.

Female genitalia (Fig. 94.4): Sternum VII rather small, moderately sclerotized, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII moderately dense scales posteriorly extending to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis forming a pair of sclerotized small plate, oval-shaped, densely scaled and sparse setae; ostium bursae behind sternum VII, antrum

short, funnel-shaped, ductus bursae narrowed, with long sclerotized plate, encircled anterior 2/3 of ductus bursae; ductus seminalis arising from lateral sac of corpus bursae posterolaterally; corpus bursae with two strong, curved, thorn-like signa, dilated at base.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (2♂, genitalia slide NP422, NP536), 14°41'32"N 98°24'17"E, 13 Jun 2002 (1♂, genitalia slide NP436, 1♀, genitalia slide NP476).

Distribution. Thailand (new record), Indonesia and Malaysia.

Remarks. Specimens were collected during the summer season at 740-965 m in hill evergreen forest.

Cimeliomorpha Diakonoff, 1966

Cimeliomorpha Diakonoff, 1966, Tijdschr. Ent. 109: 50. Type species: *Copromorpha cymbalora* Meyrick, 1907

Cimeliomorpha has been defined by the following characters; antenna in male shortly ciliated, with setae longer than cilia. Labial palpus rather short, ascending, second segment widely dilated apically, terminal segment moderate. Second abdominal sesgment in both sexes with a small, rather sclerotized pocket on each side of presegmental margin. Forewing rather broad, subtriangular, with group of raised, metallic scales, costa gently arched, termen straight, vertical, tornus broadly. Costal fold absent in male, 12 veins, all separated. In female with a weak pecten in both sexes. The male genitalia are characterized by simple tegumen, band-like, no uncus, pedunculi dilated in middle, socii weak, rather larger, gnathos with narrow half-ring shape. Valva dilated in basal half, sacculus broad, upper edge of sacculus with long hairs extended over most of surface of large basal opening of valva, a rather broad neck connecting cucullus. Cucullus obliquely elongate, tapering downwardly, and

bearing an anal thorn. Anellus rather small basal plate, caulis long and broad, aedeagus tubular, with numerous short cornuti. In female genitalia with elongate papillae anales, rather narrow. Ostium bursae located at caudal margin and separated by a narrow, belt-like lamella antevaginalis, antrum weakly sclerotized, caudally with a short, projected angle on each side of ostium bursae, dorsally with an unpaired, longitudinal colliculum, protruding beyond caudal margin of lamella antevaginalis. Ductus bursae rather long, corpus bursae membranous, elongate. Signum shaped as a round punctulate area with dots more densely accumulated in middle (Diakonoff, 1967; Obraztsov, 1968). The genus includes 3 species worldwide. *Cimeliomorpha* includes 2 species have been described from the Oriental region (Brown, 2005).

Cimeliomorpha cymbalora (Meyrick), 1907
Figs. 25.6, 70.3, 94.5

Copromorpha cymbalora Meyrick, 1907, J. Bombay Nat. Hist. Soc. 18: 152. Type locality: India (Assam, Khasi Hills). Lectotype (♂): BMNH.

Description. *Head*: Lower and upper frons white; labial palpus with first, second and apical segment white; vertex white.

Thorax: Pronotal collar, tegulae white and mesonotum white. Forewing (Fig. 25.6): Length 6.77 mm in male (n=1), 6.81 mm in female (n=1); termen rounded, ground color orange white, costa white intermixed with greyish orange, strigulae orange white, strigulae 1-3 indistinct, strigulae 4 paired and separated by dark brown, strigulae 5-9 singled, close to basal half with large patch, white extending from wing base to strigulae 4 and from costa to inner margin connected with apical patch with dark brown narrow line extending from costa to inner margin, apical patch with metallic grey extending from between strigulae 4 and white patch to middle of inner margin; median fascia extending from costa to R_2, metallic grey; postmedian fascia present as metallic grey line extending from costa to R_2, interfascia between strigulae 7 and 8 with distinct metallic grey strip extending obliquely from costa to outer

margin at M_1; wing apex metallic grey; ocellus region with spots, dark brown mixed with metallic grey extending as longitudinal row from midwing to outer margin at between CuA_1 and CuP, with two metallic grey spots near coata between R_4 and R_5 and at base of R_3, R_4 and R_5, with diffuse dark brown dashes between R_4 and tornus, between M_2 and CuA_1 with metallic grey short strip near outer margin. Underside yellowish white which patch basally connected with light brown patch apically, with yellowish grey spots on costa. Hindwing white with brown patch apical half, ventral white mixed with light brown apical half.

Male genitalia (Fig. 70.3): Tegumen with arms rather short, moderately broad, apex rounded with dense scales on apicoposterior area; uncus absent; socii large, rounded, arising from tegumen apicolaterally, pendant to basal 1/3 of tegumen, densely setose; gnathos arising from midlength of tegumen, narrowed band-like, sclerotized; anellus closely base of aedeagus; aedeagus short, widened, narrowed to apex; cornuti short, dense, spine-like; juxta triangular; valva long; sacculus large, long 2/3 of valva length, densely setose, ventromedially forming round lobe, prominenced, dorsal densely setose; neck indistinct; cucullus narrowed, long, curved, densely setose, apex with distinct one short, curved spine.

Female genitalia (Fig. 94.5): Sternum VII with large sclerotized plate, posterior margin concave medially, densely scaled, becoming more dense towards posterior margin; tergum VIII with moderately dense scales and sparse setae posteriorly, with moderately dense scales on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis with large patch, membranous, dense scales and microtrichia, lamella antevaginalis reduced, forming narrowed margin, membranous, dense microtrichia; ostium bursae behind sternum VII, antrum forming membranous cup, colliculum small, sclerotized; ductus seminalis arising from posterior 1/5 of ductus bursae; corpus with small patch, dense small granulated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Aug 2002 (1♀, genitalia slide NP442), 18 Jul 2003 (1♂, genitalia slide NP757).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected during the rainy season at 195 m in mixed deciduous forest.

Cryptophlebia Walsingham, 1900

Cryptophlebia Walsingham, 1900, Indian Mus. Notes 4 (1899): 105. Type species: *Cryptophlebia carpophaga* Walsingham, 1900 [=*Arotrophora ombrodelta* Lower, 1898].

Pogonozada Hampson, 1905, Ann. Mag. Nat. Hist. (7) 16: 586. Type species: *Pogonozada distorta* Hampson, 1905.

Phanerophlebia Diakonoff, 1957, Tijdschr. Ent. 100: 142. Type species: *Cryptophlebia perfracta* Diakonoff, 1957. [subgenus of *Cryptophlebia*].

Cryptophlebia has been defined by the following characters; medium to large moths with broad forewings, often with a darker subtriangular pretornal patch and usually with a small accesory cell with chorda from between R_2 and R_3 to between R_4 and R_5. Hindwing with short cell, especially in male, and thorax with an often conspicuous crest. Males often have secondary sexual structures such as a modified hindtibia with tufts of hair-like scales, a modified hindwing with sometimes and elongate, heavily sclerotized pocket filled with fine hair-scales beneath in distal half of CuA_2, long and mane-like scales dorsally on the abdomen. Male of all species have tergum 8 with a medial subtriangular or Y-shaped plate and with paired tufts of long filiform scales arising from shallow membranous pockets on each side, and nearly always coremata with tufts of modified, short, swollen scales. The male genitalia are

characterized by a strongly swollen, clavate valva with few sparse, very large spines on the inner surface of the cucullus, and with dense, very long, curled scales on the outer surface. In the female genitalia, the sterigma is very variable but fused with the deeply excavated hindmargin of sternum 7, the corpus bursae is usually spinulose in anterior 1/2-4/5 and sometimes has a diverticulum, and the signa are two curved horns (Diakonoff, 1969 b; Kuznetsov, 1987; Komai, 1999). The genus includes 49 species worldwide. *Cryptophlebia* includes 16 species have been described from Southeast Asia (Brown, 2005). Taxonomically diverse plant families such as Anacardiaceae, Hippocastanaceae, Fabaceae, Proteaceae, Rutaceae and Sapindaceae are recorded as hostplants, but the genus is essentially with Fabaceae (Komai, 1999). Komai and Nasu (2003) noted that *Cryptophlebia* species associated with mangrove worldwide.

Cryptophlebia amblyopa Clarke, 1976

Fig. 94.6

Cryptophlebia amblyopa Clarke, 1976, Insects Micronesia 9(1): 106. Type locality: (Palau, Koror Island, Koror). Holotype (♂): USNM.

Description. Wing pattern poorly defined.

Female genitalia (Fig. 94.6): Sternum VII slightly sclerotized, densely scaled, with two large plates posterolaterally, oval-shaped, moderately sclerotized, anterior margin sclerotized medially; posterior margin deeply incised medially; tergum VIII moderately scaled on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; ostium bursae oval-shaped, with a narrow encircled ring; lamella antevaginalis reduced; lamella postvaginalis forming group of moderately dense setae, antrum short, with two small colliculum, sclerotized; ductus seminalis arising from anterior 1/3 of ductus bursae; corpus bursae with two large, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°27'41"N 98°37'15"E, 24 Dec 2001 (1♀, genitalia slide NP84).

Distribution. Thailand and Palau Is.

Remarks. Specimen was collected during the winter season at 750 m in hill evergreen forest.

Cryptophlebia ombrodelta (Lower), 1898
Figs. 25.7, 71.1, 71.2, 95.1

Arotrophora? ombrodelta Lower, 1898, Proc. Linn. Soc. N. S. W. 23: 48. Type locality: Australia (New South Wales, Sydney). Holotype (♂): SAMA.

Cryptophlebia carpophaga Walsingham, 1900, Indian Mus. Notes 4 (1899): 106. Type locality: India (Culcutta). Holotype (♂): BMNH.

Description. *Head*: Lower frons orange white mixed with greyish orange, upper frons brown mixed with dark brown; labial palpus with first segment light brown to brown, second segment brown intermixed with light brown, apical segment brown; vertex with each scale greyish orange with dark brown apices.

Thorax: Pronotal collar greyish orange; tegulae greyish orange mixed with some scales brown to dark brown apically; mesonotum light brown mixed with brown to dark brown. Forewing (Fig. 25.7): Length 8.56 mm in male (n=9), 9.36 mm in female (n=2); male costal fold absent, termen straight; ground color light brown in female, greyish orange in male, costal strigulae greyish orange, strigulae 1-9 paired and separated by dark brown; except strigulae 3-4 with two paired; basal patch suffused with ground color; median fascia suffused with ground color in female, indistinct present as light brown on costa and indistinct strip extending obliquely to CuA_2; postmedian fascia incompleted extending oblique irregularly from costa to outer margin at between M_2 and M_3, near tornus in female; wing apex light brown to

brown, inner margin with large patch, dark brown, basal 2/3 of wing length and extending from inner margin to CuP, pretornal spot dark brown extending from inner margin to CuA_1; ocellus region orange white mixed with diffuse dark brown sinuate line; outer margin with terminal strigulae between R_1 and M_1, M_1 and M_2, M_2 and M_3. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, inner marginal area between CuA_1 and CuA_2 terminally with hair pencils, yellowish white, ventral light brown with irregular transverse line extending from costa to M_1, area between CuA_1 and CuA_2 apically with dense and suppressed scales, yellowish white mixed with greyish orange, with dense short scales, dark brown mixed with yellowish white scales fold over apically. Hindtibia with inner margin forming baskets surrounding with dense scales inner margin, orange white to pale orange basally mixed with brownish orange with dark brown apices apically, metatarsus with dense scales tuft, brown.

Abdomen (Fig. 71.2): Tergum VII with posterior margin forming sclerotized folded lobe, connected with anterior margin of tergum VIII, intersegmental area between tergum VII and VIII with a pair of dense scales laterally, tergum VIII sclerotized, with a pair of scale tufts from shallow membranous pocket on the posteromedial angle of tergum VIII, sternum VIII short subtriangular, coremata with a pair of scales tuft.

Male genitalia (Fig. 71.1): Tegumen with arms moderately broad, narrowed basally, rounded apically, without scales or setae; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, band-like, sclerotized basally; caulis long; anellus closely surrounding basal 1/5 of aedeagus; aedeagus long, slender, curved basal 1/3, swollen basal 1/4, vesica with group of dense, short cornuti; valva thickened, clavate; sacculus with sparse setae basally reaching group of dense setae medially, basal opening reaching base of cucullus, dorsal with sparse setae towards cucullus; neck indistinct; cucullus swollen, rounded at apex, moderately dense long and short setae, with distinct three sparse, strongly long spines, outer margin with sparsely long setose; posterior surface with dense scales and moderately dense long setae.

Female genitalia (Fig. 95.1): Sternum VII moderately large sclerotized plate, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterolateral corners, except on anterior margin; tergum VIII densely scaled and sparsely setose posteriorly reaching on triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; ostium bursae beneath sternum VII; lamella postvaginalis forming a pair of moderately long sclerotized plate, widened medially, scaleless; lamella antevaginalis reduced; antrum small, sclerotized, funnel-shaped, colliculum small, moderately sclerotized near mid of ductus bursae; ductus bursae poterior half narrowed; ductus seminalis arising from anterior 1/5 of ductus bursae; corpus bursae with two curved blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°31'52"N 98°37'58"E, 14 Mar 2002 (1♀, genitalia slide NP309), 14°41'39"N 98°24'10"E, 19 Apr 2002 (1♂, genitalia slide NP327), 14°41'27"N 98°27'29"E, 14 May 2002 (1♂, genitalia slide NP425), 14°40'03"N 98°36'07"E, 9 Sep 2002 (1♂), 19 Dec 2003 (2♂), 14°39'10"N 98°36'29"E, 12 Sep 2002 (1♂), 14°39'02"N 98°31'40"E, 20 Nov 2003 (1♂), 17 Jan 2004 (1♂), 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♂, 1♀, genitalia slide NP644).

Distribution. Thailand, Japan, Taiwan, Philippine Is, China, India, Sri Lanka, Sumatra, Java, Borneo, New Guinea, Caroline Is. Hawaii and Australia.

Remarks. Specimens were collected during throughout the year at 180-1,020 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Cryptophlebia repletana (Walker), 1863

Figs. 25.8, 71.3, 71.4, 95.2

Carpocapsa repletana Walker, 1863, List Specimens Lepid. Insects. Colln. Br. Mus. 28: 412. Type locality: Borneo (Sarawak). Holotype (♂): BMNH.

Argyroploce trichosoma Meyrick, 1914, Supplementa Ent. (Microlepid.) 3: 48. Type locality: Taiwan (Kosempo). Holotype (♂): BMNH.

Argyroploce tetraploca Meyrick, 1928, Exotic Microlepid. 3: 446. Type locality: Philippine Is. (Luzon, Mt. Mikiling). Holotype (♂): BMNH.

Description. *Head*: Lower frons yellowish white, upper frons dark brown; labial palpus with frist segment light brown with yellowish white spot dorsally, second segment brown to dark brown with yellowish grey spot dorsoapically, apical segment brown with yellowish grey spot apices; vertex brown mixed with dark brown.

Thorax: Pronotal collar light brown; tegulae light brown mixed with dark brown; mesonotum dark brown. Forewing (Fig. 25.8): Length 8.79 mm in male (n=7), 7.63 mm in female (n=1); male costal fold absent, termen straight, costal strigulae yellowish grey, strigulae1-8 paired and separated by dark brown, strigulae 9 singled; ground color yellowish white to yellowish grey, basal patch incompleted present as dark brown spot on costa and brown mixed with dark brown patch on inner margin, extending obliquely from inner margin to CuA_2; median fascia indistinct; wing with large patch, dark brown, broken by ground color on wing venation area, extending from wing base to apical 3/4 and from R_2 to discal cell and M_2 apically, interfascia between strigulae 5 and 6 with dark brown striae extending obliquely from costa to tornus, wing apex with large dark brown patch extending from strigulae 7 to wing apex, proximal margin extending obliquely from strigulae 7 to CuA_1, inner margin medially with irregular strip extending form inner margin to CuA_1, pretornal sub-semicircular spot dark brown extending from inner margin to CuA_2. Underside light brown with yellowish grey spots on costa and outer margin between veins R_5 and M_1, M_1 and M_2. Hindwing brown dorsally, ventrally light brown with irregular transverse line apical wing 1/3, dark brown. Hindtibia with dense scales tuft, yellowish white.

Abdomen (Fig. 71.4): Sternum VIII short, sclerotized, subtriangular, densely scales, coremata with a pair of scale tuft, moderately long, clavate-shaped.

Male genitalia (Fig. 71.3): Tegumen with arms moderately broad, without scales or setae; uncus and socii absent; gnathos arising from dorsal 1/3 of tegumen, band-like, sclerotized basally, median slightly sclerotized with dense microtrichia; anellus surrounding at base of aedeagus; aedeagus long, slender, basal 1/4 widened, basal 1/3 curved; cornuti absent; juxta triangular; valva large; neck indistinct; sacculus large with sparse setae basally, ventral margin with moderately dense setae, median with short spiniform setae mixed with long setae, with small prominenced lobe on basal opening, ventromedial area between sacculus and cucullus with large group of dense long setae, dorsal with sparse long setae; cucullus short, widened, rounded at apex, moderately dense long setae, with sparse, long spines, with single short, large spine on small ventroapical lobe.

Female genitalia (Fig. 95.2): Sternum VII distinct, wing-shaped, sclerotized, moderately dense scales, becoming more dense towards posterior margin, posterior margin deeply concaved medially; tergum VIII moderately dense scales and sparse setae towards triangular lateral extensions, papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis forming sclerotized ring, thickened, fused with lamella postvaginalis forming sclerotized long groove, dense microtrichia towards moderately dense scales patch posteriorly; colliculum short, sclerotized, ductus bursae narrowed posterior half; ductus seminalis arising from near mid of ductus bursae; corpus bursae with two blade-like signa, basal dilated.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'17"N 98°24'02"E, 9 Jan 2002 (1♂, genitalia slide NP139), 14°41'39"N 98°24'10"E, 13 Jan 2002 (1♂, genitalia slide NP150), 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂), 19 Dec 2003 (1♂), 14°39'02"N 98°31'40"E, 20 Nov 2003 (1♂), 14°41'43"N 98°27'34"E, 16 Jan 2004 (1♂), 19 Feb 2004 (1♀, genitalia slide NP645), 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♂, genitalia slide NP646).

Distribution. Thailand, Japan, Taiwan, Philippine Is. India, Sumatra, Celebes, Borneo, New Guinea and Fiji.

Remarks. Specimens were collected during the rainy season and the winter season at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Cryptophlebia rhynchias (Meyrick), 1905
Figs. 26.1, 71.5, 71.6

Platypeplus rhynchias Meyrick, 1905, J. Bombay Nat. Hist. Soc. 16: 586. Type locality: Ceylon [Sri Lanka] (Yatiyantola). Lectotype (♂): BMNH.

Description. *Head*: Lower frons difficult to defined, upper frons dark brown; labial palpus with first segment brown to dark brown, second segment brown mixed with dark brown, apical segment dark brown; vertex brown mixed with dark brown.

Thorax: Pronotal collar dark brown; tegulae brownish orange mixed with light brown to brown basally; mesonotum brownish orange mixed with light brown and dark brown. Forewing (Fig. 26.1): Length 11.06 mm in male (n=1); male costal fold absent; termen round, ground color greyish orange becoming paler to orange white apically; costal strigulae greyish orange, strigulae 1-9 paired and separated by dark brown; basal patch with median fascia forming irregular patch extending from wing base to apical 2/3, dark brown broken by ground color on longitudinal veins area, and from costa to inner margin, distal margin extending obliquely from costa to R_4, curved between R_4 and M_3 and extending obliquely to middle of inner margin; strigulae 7 with irregular dark brown striae extending from costa to tornus, wing apex with subtriangular patch, dark brown extending from costa between strigulae 7 and wing apex to CuA_1; outer margin with indistinct dark brown strip broken by white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally with outer margin between CuA_2 and CuP protrude as small lobe with grey to yellowish white scales basally, light brown ventrally.

Abdomen (Fig. 71.6): Sternum VIII short, sclerotized, subrectangular, densely scales, coremata with a pair of scales sockets, containing scales tuft.

Male genitalia (Fig. 71.5): Tegumen with arms broad, without scales or setae, apicoposterior margin raised up; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, sclerotized band-like; caulis long; anellus closely surrounding basal 1/5 of aedeagus; aedeagus large, long and slender, curved medially, widened basal 1/4, with distinct two cornuti apically, moderately long; valva thickened, with subtriangular lobe ventromedially, rounded at apex; sacculus with group of moderately dense setae basally and sparse setae reaching medial area, median with sparse short spiniform setae, dorsal with moderately dense setae towards cucullus; cucullus short, rounded at apex, ventral half slightly concaved, bearing dense, long setae and group of dense, stout, strongly spines, apical margin with row of strongly spines, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 28 Oct 2003 (1♂, genitalia slide NP592).

Distribution. Thailand, India, Sri Lanka, South Mariana Is., Samoa, Sudest Is., New Hebrides and Australia.

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Cydia Hübner, [1825] 1816

Cydia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 375. Type species: *Phalaena* (*Tortrtix*) *pomonella* Linnaeus, 1758.

Laspeyresia Hübner, [1825] 1816, Verz. Bekannter Schmett.: 381. Type species: *Tortrix corollana* Hübner, [1822-1823]. [preoccupied].

Erminea Kirby & Spence, 1826, Introd. Ent. 3: 122. Type species: *Phalaena (Tortrix) pomonella* Linnaeus, 1758.

Carpocapsa Treitschke, 1829, in Ochsenheimer, Schmett. Eur. 7: 231. Type species: *Phalaena (Tortrix) pomonella* Linnaeus, 1758.

Coccyx Treitschke, 1829, in Ochsenheimer, Schmett. Eur. 7: 230. Type species: *Tortrix strobilana* Hübner, [1799] [=*Phaleana (Tortrix) strobilella* Linnaeus, 1758].

Semasia Stephens, 1829, Nom. Br. Insects: 47. Type species: *Phalaena (Tortrix) pomonella* Linnaeus, 1758.

Carpocampa Harris, 1841, Rep. Insects Mass. Injurious Veg.: 351. [unjustified emedation of *Carpocapsa*].

Cerata Stephens, 1852, List Specimens Br. Anim. Colln. Br. Mus. 10: 77. Type species: *Penthina servillana* Duponchel, 1836.

Melissopus Riley, 1881, Trans. Acad. Sci. St. Louis 4: 322. Type species: *Carpocapsa latiferreana* Walsingham, 1879.

Melisopus Riley, 1881, Trans. Acad. Sci. St. Louis 4: 322. [misspelling of *Melissopus*].

Mellisopis Fernald, 1882, Trans. Am. Ent. Soc. 10: 54. [misspelling of *Melissopus*].

Melliopus Packard, 1890, Fifth Rep. U.S. Ent. Comm. 219. [Misspelling of Melissopus].

Adenoneura Walsingham, 1907, in Sharp, Fauna Hawaiiensis or Zool. Sandwich (Hawaiian) Isles 1 (5): 677. Type species: *Adenoneura falsifalcellum* Walsingham, 1907.

Mellissopus Fernald, 1908, Genera Tortricidae Types: 60. [misspelling of *Melissopus*].

Crobylophora Kennel, 1908, Palaear. Tortr.: 50. Type species: *Tortrix inquinatana* Hübner, [1796-1799]. [preoccupied].

Hedulia Heinrich, 1926, Bull. U.S. Nat. Mus. 132: 65. Type species: *Hedulia injectiva* Heinrich, 1926.

Lasperesia Wu, 1938, Cat. Ins. Sin. 4: 57. [misspelling of *Laspeyresia*].

Kenneliola Paclt, 1951, Rev. Fr. Lépid. 13: 127. [replacement name for *Crobylophora*].

Lespeyresia Gozmány, 1957, Acta Zool. Hung. 3: 134. [misspelling of *Laspeyresia*].

Pseudotomoides Obraztsov, 1959, Tijdschr. Ent. 102: 200. Type species: *Phalaena* (*Tortrix*) *strobilella* Linnaeus, 1758.

Crobilophora Obraztsov, 1959, Tijdschr. Ent. 102: 176. [misspelling of *Crobylophora*].

Erminia Obraztsov, 1959, Tijdschr. Ent. 102: 175. [misspelling of *Erminea*].

Phanetoprepa Obraztsov, 1968, J. New York Ent. Soc. 76: 236. Type species: *Phanetoprepa agenjoi* Obraztsov, 1968.

Danilevskia Kuznetsov, 1970, Ent. Obozr. 49: 446. Type species: *Danilevskia silvana* Kuznetsov, 1970.

Dicraniana Diakonoff, 1984., Ent. Gall. 1: 162. Type species: *Semasia seriana* Kennel, 1901. [subgenus of *Cydia*].

Cydia has been defined by the following characters; small to medium-sized moth, greyish brown, densely suffused with whitish, with whitish costal strigulae and a distinct ocelloid patch but no dorsal blotch. The genus has rather short and slender, porrect to lightly upcurved, slightly sinuate labial palpi. The genus is characterized by M_3 and CuA_1 stalked in the hindwing which is modified in the male, usually with a series of modified, grandular scales along either side of 3A and a thickened anal margin, often rolled upwardly, forming an anal fold with modified scales and holding a thin hairpencil from base of hindwing. The male abdomen lacks coremata, has sternum 2 with variably developed sternal rods and tergum 8, a large plate with a convex hind margin. The male genitalia are characterized by a sacculus which is subbasally usually concave on ventral margin and often has an angulate ridge at base, and a curved or sinuate aedeagus, often dorsoventrally flattened and/or with a lateral or dorsal process, or with a patch of thorns. The female genitalia are very diverse, corpus bursae with a diverticulum, a ring of granules around its posterior end and the ductus seminalis originating from the bursa neck. The genus includes 236 species worldwide. *Cydia* includes 10 species have been described from the Oriental region (Brown, 2005).

Cydia celiae (Clarke), 1976

Figs. 26.2, 95.3

Laspeyresia celiae Clarke, 1976, Insects Micronesia 9 (1): 120. Type locality: Micronesia (Yap Is., Colonia). Holotype (♀): USNM. [new combination].

Description. *Head*: Lower frons light brown, upper frons brown; labial palpus with first segment light brown, second segment light brown, apical segment light brown to brown, vertex brown.

Thorax: Pronotal collar brown; tegulae brown mixed with dark brown; mesonotum brown mixed with dark brown. Forewing (Fig. 26.2): Length 4.68 mm in female (n=1); termen slightly concave between wing apex and M_3; ground color brown, costal strigulae yellowish white, strigulae 1 and 2 indistinct, strigulae 3-9 paired and separated by dark brown; basal fascia indistinct; interfascia between strigulae 1 and 2 with dark brown striae extending from costa to inner margin, curved medially; subbasal fascia extending from costa to inner margin, curved medially; median fascia extending from costa to inner margin, distal margin extending obliquely from costa to R veins, angled and extending obliquely to inner margin, dark brown; strigulae 5 with indistinct grey striae extending obliquely from costa to R vein, postmedian fascia extending obliquely from costa to between R_5 and M_1 near outer margin, dark brown, strigulae 7 with silvery grey striae extending obliquely from costa to R_5 near outer magin; ocellus region with patch between R_5 and tornus; outer margin with dark brown strip broken by yellowish white strigulae between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 95.3): Sternum VII with moderately large sclerotized plate, lateral margin more sclerotized, narrowed towards posteriorly, densely scaled, except over anteromedial half medially with sclerotized ridge, V-shaped, with small sclerotized plate on anteromedial margin; tergum VIII densely scaled posteriorly, triangular lateral extensions with dense scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming two large patches of dense scales; ostium bursae covered by sternum VII; ductus bursae with sclerotized plate anterior 1/3, with small sclerotized knot on sclerotized plate medially; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two moderately long, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°35'51"N 98°37'58"E, 23 Apr 2002 (1♀, genitalia slide NP356).

Distribution. Thailand (new record) and Western Caroline Is.

Remarks. Specimen was collected during the summer season at 260 m im mixed deciduous forest.

Cydia malesana (Meyrick), 1920
Figs. 26.3, 71.7, 95.4

Laspeyresia malesana Meyrick, 1920, Exotic Microlepid. 2: 352. Type locality: India (Coimbatore). Lectotype (♂): BMNH.

Laspeyresia platydryas Meyrick, 1932, Exotic Microlepid. 4: 226. Type locality: Southern Rhodesia [Zimbabwe] (Salisbury). Holotype (♀): BMNH.

Cydia malissana Rose & Pooni, 2003, J. Ent. Res. 27: 252. [misspelling of *malesana*].

Description. *Head*: Lower frons difficult to defined, upper frons yellowish white, labial palpus with first segment orange white, second segment orange white, apical segment orange white; vertex light brown with yellowish apices.

Thorax: Pronotal collar brown, tegulae and mesonotum light brown with yellowish white apices. Forewing (Fig. 26.3): Length 5.27 mm in male (n=12), 6.31 mm in female (n=17); male costal fold absent, termen slightly concave between wing apex and M_2; ground color light brown intermixed with yellowish white; costal strigulae yellowish white, strigulae 1 and 2 indistinct, strigulae 3-9 paired and separated by dark brown, basal and subbasal fascia absent, median fascia extending obliquely from costa to R_2, dark brown mixed with greyish orange; postmedian fascia extending obliquely from costa to R_3; preterminal fascia extending obliquely from costa to outer margin at R_5, strigulae 5-9 with short strigulae, grey striae extending

obliquely from costa to R vein; ocellus region with row of dark brown dashes between R_3 and termen, with silvery striae near outer margin between M_2 to between CuA_1 and CuA_2. Underside light brown with yellowish grey indistinct spots on costa. Hindwing brown dorsally with anal margin forming sclerotized with yellowish white scales, light brown ventrally.

Male genitalia (Fig. 71.7): Tegumen with arms, moderately broad, apical half with moderately dense scales; uncus and socii absent; gnathos arising from apical 1/3 of aedeagus, band-like, sclerotized basally; anellus surrounding basal 1/5 of aedeagus, opening laterally; aedeagus widened basal 2/3, apical 1/3 abruptly narrowed; cornuti moderately dense, located at apical 1/3 of aedeagus; valva curved medially; sacculus with group of short, dense setae basally, ventromedial margin with long, sparse setae, median with moderately dense, long and short spiniform setae, dorsal with group of dense, long and moderately long spiniform setae; neck indistinct; cucullus broad, apex rounded, sparsely setose, dense long and short spines along near outer margin, outer margin moderately dense setae.

Female genitalia (Fig. 95.4): Sternum VII with moderately large, sclerotized plate, posterior margin deeply concaved medially, posterolateral corner extending pointed posterolaterally, densely scaled except anterior 1/3; tergum VIII without scales or setae, triangular lateral extensions with moderately dense scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis distinct, forming long, sclerotized groove, moderately widened, apicolateral half with moderately dense scales, posterior end with group of moderately dense scales; ductus bursae rather short, sclerotized; ductus seminalis arising from near posterior end of corpus bursae, corpus bursae with incompleted sclerotized ring near posterior end, with two blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'31"N 98°24'27"E, 13 May 2002 (1♀), 14°41'27"N 98°27'29"E, 14 May 2002 (2♂, 2♀, genitalia slide NP398), 14°41'43"N 98°27'34"E, 15 May 2002 (8♂, genitalia slide NP399, NP532, NP539, NP553, 12♀, genitalia slide NP751), 19 Feb 2004 (1♀,

genitalia slide NP744), 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂), 14°40'03"N 98°36'07"E, 28 Jun 2003 (1♂, genitalia slide NP669).

Distribution. Thailand (new record), India and Rhodesia.

Remarks. Specimens were collected during the winter season and the summer season at 180-1,040 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Cydia obumbrana Kuznetsov, 1992

Fig. 72.1

Cydia obumbrana Kuznetsov, 1992, Ent. Obozr. 71: 854. Type locality: North Vietnam (Sonla Province, Naniu). Holotype (♂): ZMAS.

Description. Wing pattern poorly defined.

Male genitalia (Fig. 72.1): Tegumen subtriangular, with arms, rather narrowed, rounded at apex, densely scaled apically; uncus and socii absent; gnathos arising from midlength of tegumen, band-like, disconnected medially, sclerotized basally; anellus closely surrounding at base of aedeagus; aedeagus long, curved basally, concaved and forming sclerotized lobe near ventromedially; cornuti two, spine-like, rather short, located apically; valva moderately long, slightly curved medially, constricted near ventromedially; sacculus with group of dense setae basally, median with lobe, rather small on basal margin, densely setose, ventral area sparsely setose towards subtriangular lobe ventromedially; cucullus subovate, moderately long, with dense spines along near ventral margin.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (1♂, genitalia slide NP258).

Distribution. Thailand (new record) and Vietnam.

Remarks. Specimen was collected during the summer season at 220 m in mixed deciduousforest.

Unplaced *Cydia*

Cydia sp. A

Figs. 26.4, 95.5

Description. *Head*: Lower frons orange white, upper frons light brown; labial palpus with first segment orange white, second segment orange white, pale orange to light orange apically, apical segment pale orange to light orange; vertex brown to dark brown apical half, basal half orange white to pale orange.

Thorax: Pronotal collar light brown mixed with brown; tegulae light brown mixed with brown; mesonotum light brown to dark brown. Forewing (Fig. 26.4): Length 5.59 mm in female (n=1); termen concaved between R_5 and M_2; ground color brown mixed with dark brown, some scales with orange white apices; costal strigulae greyish orange, strigulae 1-5 indistinct, strigulae 6-9 singled, costal margin with patch, light brown between costa to Sc and from wing base to striguale 4; median fascia indistinct present as irregularly strip extending obliquely from costa to R_4; postmedian fascia with irregular longitudinal line, extending obliquely from costa between strigulae 6 and 7 to outer margin at R_5; ocellus region with 4 dark brown dashes between M_1 and CuA_2, surrounding by light brown scales, strigulae 5 and 7 with grey striae extending obliquely from costa to outer margin, area between outer margin and ocellus region with grey strip between M_1 and CuA_2; outer margin with distinct dark brown line. Underside brown with yellowish grey spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 95.5): Sternum VI with large, sclerotized plate, densely scaled; sternum VII with small, sclerotized plate, distinct V-shaped, densely scaled, except medially; tergum VIII moderately dense scales posteriorly, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose

bases; lamella antevaginalis reduced, lamella postvaginalis forming two large, elongate patches, densely scaled, extending widened posteriorly, anterior narrowed, sclerotized, scaleless; ostium bursae covered by sternum VII, antrum forming cup-shaped, colliculum small, encircled ductus bursae anteriorly; ductus seminalis arising from anterior 1/3 of ductus bursae; corpus bursae with large diverticulum anteriorly, with two, moderately long, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♀, genitalia slide NP572).

Remarks. Specimen was collected during the winter season at 255 m in dry evergreen forest.

Dichrorampha Guenée, 1845

Dichrorampha Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 185. Type species: *Grapholitha plumbagana* Treitschke, 1830.

Dicrorampha Doubleday, 1850, Synon. List Br. Lepid.: 26. [misspelling of *Dichrorampha*].

Lipoptycha Lederer, 1859, Wien. Ent. Monatschr. 3: 370. Type species: *Coccyx bugnionana* Duponchel, 1842.

Balbis Walsingham, 1897, Proc. Zool. Soc. Lond. 1897: 128. Type species: *Carpocapsa assumptana* Walker, 1863.

Lepidoptycha Dyar, 1901, Proc. Ent. Soc. Wash. 4: 469. [misspelling of *Lipoptycha*].

Lipoptychodes Obraztsov, 1953, Mitt. Münch. Ent. Ges. 43: 60. Type species: *Coccyx bugnionana* Duponchel, 1843. [subgenus of *Dichrorampha*].

Dichroramphodes Obraztsov, 1953, Mitt. Münch. Ent. Ges. 43: 77. Type species: *Dichrorampha gueneeana* Obraztsov, 1953.

Paralipoptycha Obraztsov, 1958, Tijdschr. Ent. 101: 244. Type species: *Phalaena plumbana* Scopoli, 1763.

The genus includes 116 species worldwide and no one has been described from the Southeast Asia (Brown, 2005).

Unplaced *Dichrorampha*

Dichrorampha sp. A

Fig. 72.2

Description. Wing pattern poorly defined.

Male genitalia (Fig. 72.2): Tegumen with arms, narrowed, apically rounded, scaleless; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, band-like; caulis long; anellus closely surrounding basal of aedeagus; aedeagus long, curved basally; sacculus with group of dense, moderately long setae basally, ventromedially with group of dense, moderately long setae; neck short, concaved on margins, without setae; cucullus moderately large, subovate, apex rounded, dense spines apically, ventrobasal area forming moderately large, rounded lobe, extending below neck.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP584).

Remarks. Specimen was collected during the winter season at 255 m in dry evergreen forest.

Dierlia Diakonoff, 1976

Dierlia Diakonoff, 1976, Zool. Verh. Leiden 144: 30. Type species: *Dierlia aurata* Diakonoff, 1976.

Dierlia has been defined by the following characters; small-sized moths with a large androconial field consisting of thin grey hair-like scales on the upper surface of the hindwing. Hindwing venation sexually dimorphic: in male $Sc+R_1$ and Rs fused beyond outer edge of discal cell and to costa, in female $Sc+R_1$ and Rs free throughout. M_3 and CuA_1 coincident or long-stalked. Male abdomen tergum 6 with a thick, transeverse patch of dark scales, tegumen a broad band with rather pointed top; valva large, with an excavation on dorsal edge of basal cavity, without basal process. Aedeagus little curved downwards, gradually narrowed distally, with one or two speculate cornuti. Female genitalia with ductus bursae rather short, with a small funnel-shaped antrum, with an irregularly sclerotized ring connected with an oval sclerite with a concavity (Diakonoff, 1976; Komai, 1999). The genus includes 2 species worldwide and all have been described from Nepal (Brown, 2005).

Unplaced *Dierlia*

Dierlia sp. A

Figs. 72.3, 72.4

Description. Wing pattern poorly defined.

Abdomen (Fig. 72.4): Sternum VIII short, subtriangular, coremata with a pair of scale tufts laterally, moderately long, lanceolate-shaped.

Male genitalia (Fig. 72.3): Tegumen with arms moderately broad, dorsal margin rounded; uncus and socii absent, without scales or setae; gnathos arising from midlength of tegumen, band-like, slightly sclrotized; caulis moderately long; anellus closely surrounding basal of aedeagus; aedeagus moderately long, slender; cornuti 11,

long half of aedeagus length; valva deeply incised ventrally forming neck; sacculus with group of moderately dense and long setae basally, ventrobasal margin with sparse setae, median with moderately dense spiniform setae between basal opening and neck; neck rather short, without setae; cucullus rather short, slightly larger than sacculus, enlarged to apex, apex oblique truncated, with dense spines apically.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 27 Sep 2002 (1♂, genitalia slide NP500).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Dierlia sp. B

Figs. 26.5, 95.6

Description. *Head*: Lower frons light brown, upper frons brown; labial palpus with first segment yellowish white, second segment light brown mixed with light brown apically, apical segment light brown; vertex brown.

Thorax: Pronotal collar brown; tegulae dark brown with yellowish grey apices; mesonotum dark brown with yellowish white apices. Forewing (Fig. 26.5): Length 3.59 mm in female (n=1); termen slightly concave between wing apex and M_2; ground color brown intermixed with light brown; costal strigulae yellowish white, strigulae 1 and 2 indistinct, strigulae 3-9 paired and separated by dark brown, basal and subbasal fascia indistinct suffused with ground color; median fascia distinct extending from costa to inner margin, curved medially, dark brown; postmedian and preterminal fascia indistinct suffused with ground color; wing apex dark brown; ocellus region with irregular transverse line extending obliquely from R_2 near costa to R_5 and extending to tornus; outer margin with three dark brown spots between M_1 and CuA_1. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 95.6): Sternum VII with moderately large sclerotized plate; posterior margin deeply concaved medially, anterolaterally deeply concaved obliquely, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming large patch, subtriangular, dense microtrichia; ostium bursae covered by sternum VII, antrum forming a small, sclerotized cup; ductus bursae rather short, with small, sclerotized plate posteriorly; ductus seminalis arising from near posterior end of ductus bursae; corpus bursae with two curved, blade-like signa, moderately large.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP627).

Remarks. Specimen was collected during the winter season at 742 m in hill evergreen forest.

Dierlia sp. C

Figs. 26.6, 96.1

Description. *Head*: Lower frons light brown, upper frons brown; labial palpus with first segment light brown, second segment light brown to brown with dark brown apically, apical segment brown; vertex brown.

Thorax: Pronotal collar dark brown; tegulae dark brown with yellowish white apices; mesonotum dark brown with yellowish apices. Forewing (Fig. 26.6): Length 4.22 mm in female (n=1); termen slightly concave between wing apex and M_2; ground color brown; costal strigulae yellowish white, strigulae 1-4 two paired, strigulae 5 and 6 paired and separated by dark brown, strigulae 7 and 8 indistinct, strigulae 9 distinct, singled; basal and subbasal fascia indistinct suffused with ground color; median fascia distinct on costa, dark brown extending obliquely from costa to R vein, angled and extending irregularly to inner margin, brown to dark brown, strigulae 5 with grey striae extending obliquely from costa to R_5, interfascia between strigulae 5 and 6 with

narrow dark brown striae extending from costa to R_5, indistinct near costa, outer margin with row of dark brown spots along outer margin between veins, R_5 to tornus; wing apex with small dark brown spot; ocellus region with irregular patch, yellowish white between R_4 and tornus, strigulae 6 with grey striae extending obliquely from costa to outer margin at between R_5 and M_1; outer margin without terminal strigulae. Underside light brown with yellowish white spots on costa between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 96.1): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming a wide plate, fused with antrum laterally, dense microtrichia, antrum forming a moderately wide, sclerotized cup; ostium bursae covered by sternum VII, colliculum small, weakly sclerotized; ductus bursae short, with small, narrowed sclerotized plate, posterior half of ductus bursae; ductus seminalis arising from posterior end of ductus bursae; corpus bursae with large, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 23 Aug 2003 (1♀, genitalia slide NP613).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Fulcrifera Danilevsky & Kuznetsov, 1968

Fulcrifera Danilevsky & Kuznetsov, 1968, Fauna SSSR (N.S.) 98 (Lepid. 5(1)): 454.

Type species: *Laspeyresia luteiceps* Kuznetsov, 1962.

Fulcrifera species are small grapholitine moths with indistinct wing pattern, light greyish brown to dark brown, densely irrorated with whitish costal strigulae and

distinct ocelloid patch. The labial palpus is short and slender, porrect and sinuate to slightly upcurved. Hindwing with M_3 and CuA_1 stalked, in the male with 3A approximated to the thickened anal margin which is rolled upwardly to form an anal fold with modified cilia and encloses a thin hairpencil from the base of the anal margin. A8 without coremata. The male genitalia characterized by narrow gnathos arms arising just below the top of tegument and running laterally along the subscaphium, a sacculus which is ventrally strongly concave near its base and forms an angular ridge, and an aedeagus with an often parallel, strongly sclerotized process dorsally from anellus. The female genitalia are characterized by slender ovipositor lobes, a ring-shaped sterigma with a heart-shaped spinulose plate in the lamella postvaginalis, a long ductus bursae widened below inception of ductus seminalis, and a corpus bursae with a diverticulum and two horn-shaped signa. Fletcher (1932) reported that the larvae of *tricentra* (Meyrick) feed on stems and branches of *Tephrosia purpurea* at Pusa, India. The genus includes 14 species worldwide. *Fulcrifera* includes only one species from the Oriental region.

Fulcrifera tricentra (Meyrick), 1907

Fig. 72.5

Laspeyresia tricentra Meyrick, 1907, J. Bombay Nat. Hist. Soc. 17: 734. Type locality: Ceylon [Sri Lanka] (maskeliya). Lectotype (♂): BMNH.

Laspeyresia crocopa Meyrick, 1907, J. Bombay Nat. Hist. Soc. 18: 146. Type locality: Ceylon [Sri Lanka] (Golboda). Holotype (♂): BMNH.

Laspeyresia pseudonectis Meyrick, 1907, J. Bombay Nat. Hist. Soc. 17: 147. Type locality: India (Bombay, Surat). Holotype: BMNH

Description. Wing pattern poorly defined.

Male genitalia (Fig. 72.5): Tegumen subtriangular, with arms, narrowed, scaleless; uncus and socii absent; gnathos arising from apex of tegumen, completed

band-like, sclerotized and narrowed basally; anellus surrounding at base of aedeagus partially, dorsally developed, extending long as aedeagus length, curved apically, denticulated; aedeagus long, widened at base, slightly narrowed to apex; cornuti absent; sacculus with group of short, dense setae basally, median with sparse short, spiniform setae between basal opening and neck; neck short, slightly concaved; cucullus short, subovate, with dense, short spines and long spiniform setae apically, sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40′03″N 98°36′07″E, 28 Jun 2003 (1♂, genitalia slide NP710).

Distribution. Thailand (new record), Ceylon and India.

Remarks. Specimen was collected during the summer season at 180 m in mixed deciduous forest.

Grapholita Treitschke, 1829

Grapholita Treitschke, 1829, in Ochsenheimer, Schmett. Eur. 7: 232. Type species: *Pyralis dorsana* Fabricius sensu Treitschke, 1829 [=*Tortrix lunulana* [Denis & Schiffermüller], 1775].

Grapholitha Treitschke, 1830, in Ochsenheimer, Schmett. Eur. 8: 203. [unjustified emendation of *Grapholita*].

Euspila Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 103. Type species: *Tinea compositella* Fabricius, 1775.

Aspila Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 104. Type species: *Coccyx janthinana* Duponchel, 1835.

Ephippiphora Duponchel, 1834, Annls Soc. Ent. Fr. 3: 446. Type species: *Pyralis dorsana* Fabricius sensu Duponchel, 1834 [*Phalaena jungiella* Clarke, 1759].

Opadia Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 182. Type species: *Grapholitha funebrana* Treitschke, 1835.

Stigmonota Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 182. Type species: *Phalaena jungiella* Clarke, 1759.

Ephippiophora Agassiz, 1847, Nomencl. Zool. (Index Univers.): 404. [misspelling of *Ephippiphora*].

Coptoloma Lederer, 1859, Wien. Ent. Monatschr. 3: 370. Type species: *Coccyx janthinana* Duponchel, 1835.

Ebisma Walker, 1866, List Specimens. Lepid. Insects. Colln. Br. Mus. 35: 1803. Type species: *Ebisma seclusana* Walker, 1866.

Grapholltha Christoph, 1881, Bull. Soc. Nat. Moscou 56: 419. [misspelling of *Grapholitha*].

Grapholita has been defined by the following characters; small to medium-sized moths with wing pattern variably developed dorsal blotch consisting of one, two, or four whitish lines from middle of dorsum, rarely without. The genus is characterized by rather short, upcurved labial palpi with long, spreading scales along lower ventral margin, a hindwing without sexual dimorphism in venation. The male genitalia are characterized by a weakly sclerotized tegumen except for its anterior margin, absence of uncus and socii, the valva constricted near middle and a rounded or ovate cucullus. The female genitalia are characterized by a rather short and wide ductus bursae and the absence of a diverticulum to the corpus bursae. Coremata usuallys well-developed, with paired tufts of filiform and sometimes also lanceolate

scales, with intersegmental ventral sclerite usually with a pair of long levers, and with a small crescent-shaped sternum 8 with a pair of short projection laterally (Kuznetsov, 1987; Komai, 1999). The genus includes 134 species worldwide (Brown, 2005). *Grapholita* includes 15 species have been described from Southeast Asia. The genus mainly associated with Fabaceae in the Palaearctic region (Komai, 1999).

Grapholita comanticosta Kuznetsov, 1988
Figs. 26.7, 72.6, 72.7

Grapholita comanticosta Kuznetsov, 1988, Trudy Zool. Inst. Leningrad 176: 94.
Type locality: North Vietnam (Vinhphu Province, Tamdao). Holotype (♂): ZMAS.

Description. *Head*: Lower frons greyish yellow; upper frons brown; labial palpus with first segment greyish orange, second segment greyish orange mixed with brownish orange apices, with dark brown spot medially and apically, apical segment dark brown with orange white apices; vertex brown.

Thorax: Pronotal collar, tegulae and mesonotum brown with greyish orange apices. Forewing (Fig. 26.7): Length 6.36 mm in male (n=1); male costal fold absent; termen slightly concave between wing apex and M_2; ground color brownish orange; costal strigulae orange white, strigulae 1 and 2 indistinct, strigulae 3 and 4 two paired and separated by dark brown, strigulae 5-9 paired and separated by dark brown, basal and subbasal fascia indistinct suffused with ground color; median fascia distinct on distal margin extending obliquely from costa to inner margin, brown, strigulae 5 with silvery grey striae extending obliquely from costa to inner margin, enlarged medially, interfascia between strigulae 5 and 6 with dark brown dashes extending obliquely from R_2 to tornus, surrounding with light brown scales; postmedian fascia extending obliquely from costa to outer margin, light brown to brown with dark brown dashes between R_3 and CuA_2, strigulae 7 with silvery grey striae extending obliquely from costa to outer margin at R_5, ocellus region with narrowed transverse line, silvery grey

extending from M_1 to tornus; outer margin with terminal strigulae, yellowish white between R_5 and M_1. Underside dark brown with yellowish white spots on costa and outer margin between veins. Hindwing dark brown dorsally becoming paler medially, ventrally brown to dark brown.

Abdomen (Fig. 72.7): Coremata with a pair of scale-tufts laterally, long, lanceolate-shaped.

Male genitalia (Fig. 72.6): Tegumen with narrowed arms, scaleless; uncus and socii absent; gnathos arising from near middle of tegumen, band-like, narrowed and sclerotized basally; anellus closely basal 1/6 of aedeagus; aedeagus large, moderately long, near apical 1/3 dilated, constricted medially; cornuti dense apically; juxta triangular; valva with dorsal and ventral margin moderately sclerotized, dorsomedially deeply incised forming neck, sparsely setose ventrally; sacculus with group of short, dense setae basally and sparsely setose along ventral margin, median with moderately dense, long and short setae along basal opening; cucullus large, suboval-shaped, sparsely setose, with long and short, dense spines along near outer marginal area, especially ventrobasal area, with group of moderately long, stout spines extending to neck.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP143).

Distribution. Thailand (new record) and Vietnam.

Remarks. Specimen was collected during the summer season at 742 m in hill evergreen forest.

Grapholita dysaethria Diakonoff, 1982
Figs. 26.8, 72.8, 72.9

Grapholita dysaethria Diakonoff, 1982, Zool. Verh. Leiden 193: 16. Type locality: Sri Lanka (Kandy, Udawattekelle). Holotype (♂): USNM.

Description. *Head*: Lower frons yellowish white, upper frons light brown to brown; labial palpus with first segment light brown, second segment light brown, apical segment light brown; vertex brown to dark brown.

Thorax: Pronotal collar brown; tegulae brown to dark brown; mesonotum brown to dark brown. Forewing (Fig. 26.8): Length 4.4 mm in male (n=1); male costal fold absent; termen rather round; ground color light brown to brown; costal strigulae white, strigulae 1 and 2 indistinct, strigulae 3-6 paired and separated by dark brown, strigulae 7-9 singled; basal patch present as irregular patch extending from costa to inner margin, distal margin extending obliquelyrom costa to midwing, angled and extending obliquelyo inner margin, dark brown intermixed with brown; median fascia extending distinct obliquelyrom costa to M_1, angled and extending oblique irregularlyo inner margin, dark brown; interfascia between strigulae 5 and 6 with distinct dark brown striae extending obliquelyrom costa to outer margin at M_1, strigulae 5 with silvery grey striae extending obliquelyrom costa to R_3, strigulae 6 with silvery grey striae extending obliquelyrom costa to outer margin at R_5; ocellus region indistinct four dark brown dashes between M_1 and CuA_2, surrounding by greyish yellow scales, with silvery grey strip on margins; outer margin with terminal strigulae, yellowish white between R_5 and M_1. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, light brown ventrally.

Abdomen (Fig. 72.9): Sternum VIII short, subrectangular, coremata with a pair of scale-tufts laterally, long, filiform-shaped.

Male genitalia (Fig. 72.8): Tegumen subtriangular, with arms, widened, scaleless, uncus and socii absent; gnathos arising from near midlength of tegumen, narrowed, long, incompleted band-like; anellus closely basal of aedeagus; aedeagus moderately long, widened basally, narrowed to apex, curved medially; cornuti dense; sacculus with basal opening widened, moderately dense, long setae basally, ventromedially with dense, long setae, median with group of moderately dense and long setae, dorsal sparsely setose; neck long, deeply concaved ventrally, sparsely setose; cucullus subovate, moderately dense setae with dense long and short, spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 22 Dec 2003 (1♂, genitalia slide NP597).

Distribution. Thailand (new record) and Sri Lanka.

Remarks. Specimen was collected during the winter season at 195 m in mixed deciduous forest.

Grapholita seclusana (Walker), 1866

Figs. 27.1, 73.1, 96.2

Ebisma seclusana Walker, 1866, List Specimens. Lepid. Insects. Colln. Br. Mus. 35: 1804. Type locality: New Guinea. Holotype (♀): BMNH.

Grapholita magnana Kuznetsov, 1988, Trudy Zool. Inst. Leningrad 176: 91. Type locality: North Vietnam (Vinhphu Province, Tamdao). Holotype (♂): ZMAS.

Description. *Head*: Lower frons yellowish white, upper frons brownish orange, labial palpus with first segment yellowish white to yellowish grey mixed with brown dorsoapically, with dark brown spot dorsomedially; vertex brownish orange to light brown.

Thorax: Pronotal collar brown; tegulae light brown to brown; mesonotum brown mixed with light brown anteriorly. Forewing (Fig. 27.1): Length 11.4 mm in male (n=4), 10.4 mm in female (n=1); male costal fold absent; terman slightly concaved between wing apex and M_1; ground color greyish orange intermixed with diffuse transverse brown line between R vein and inner margin; costal strigulae orange white, strigulae 1-6 paired and separated by dark brown, strigulae 7, 8 and 9 singled; basal and subbasal fascia indistinct suffused with ground color, median fascia distinct on costa extending obliquely from costa to R_3, brown, interfascia between strigulae 5 and 6 with strip extending obliquely from costa enlarged to tornus, brownish orange mixed with dark brown dashes between R_5 and tornus; postmedian fascia extending from costa to outer margin between R_5 and M_1, brownish orange to brown with dark brown dashes between R_4 and M_3, strigulae 5 with silvery striae extending from costa to inner margin near tornus broken by ground color between R_4 and M_1, strigulae 6 with silvery striae extending obliquely from costa to R_2, strigulae 7 with silvery striae extending obliquely from costa to R_5, apical wing with silvery small strip between M_2 and CuA_1 near outer margin; outer margin with orange white strigulae between R_5 and M_1. Underside brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, becoming paler basally, light brown to brown ventrally. Hindtibia with dense scales tuft, dark brown with white to grey scales posterior half.

Male genitalia (Fig. 73.1): Tegumen with narrowed arms, scaleless, rounded at apex; uncus and socii absent; gnathos arising from midlength of tegumen, sclerotized basally; anellus closely surrounding basal of aedeagus; aedeagus long and narrowed, over basal 1/3 widened; cornuti dense apically; valva slightly curved downward basally, deeply incised ventromedially forming neck, short; sacculus with small group of moderately long setae basally, ventral margin with row of sparse setae, abruptly short towards neck, median with moderately dense, long and short setae between basal opening and neck, dorsal sparsely long setose; cucullus broaded and rounded, sparsely setose, dense long and moderately long spines near outer marginal area, outer margin with row of sinuated setae.

Female genitalia (Fig. 96.2): Sternum VII moderately large sclerotized plate, except posterolateral area, weakly sclerotized, densely scaled, becoming more dense towards posterior margin, posterior margin slightly concaved medially; tergum VIII densely scaled posteriorly, triangular lateral extensions densely scaled; lamella antevaginalis reduced; lamella postvaginalis forming large patch of densely scaled and microtrichiate extending posteriorly; ostium bursae covered by sternum VII, antrum forming a wide, sclerotized cup; ductus bursae with small sclerotized plate and ductus seminalis present near anterior end; corpus bursae with two large, unequal blade-like signa, larger signum more curved.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°31'52"N 98°37'58"E, 14 Mar 2002 (2♂, genitalia slide NP310, NP311), 14°32'21"N 98°37'17"E, 15 Mar 2002 (2♂, genitalia slide NP247, NP251, 1♀, genitalia slide NP250).

Distribution. Thailand (new record), New Guinea and Vietnam.

Remarks. Specimens were collected during the summer season at 250-270 m in mixed deciduous forest.

Unplaced *Grapholita*

Grapholita sp. A

Figs. 73.2, 73.3

Description. Wing pattern poorly defined.

Abdomen (Fig. 73.3): Coremata with a pair of row, arrange obliquely, long lanceolate-shaped scales, and a pair of long scale-tufts, filiform-shaped.

Male genitalia (Fig. 73.2): Tegumen with arms moderately broad, slightly emarginated apicoposteriorly, scaleless; uncus and socii absent; gnathos arising from

middle of tegumen length, membranous; caulis long; anellus closely surrounding basal of aedeagus; aedeagus long and slender, slightly narrowed to apex, basal half curved, apical half straight; six deciduous cornuti; vesica with group of dense, narrowed spine-like; sacculus with group of moderately dense setae basally, ventromedial margin with moderately dense, long setae, median with sparsely setose on basal opening, dorsal sparsely setose towards neck; neck deeply incised ventrally, sparsely setose, dorsal margin sclerotized extending over cucullus; cucullus moderately large, subovate, sparsely setose, dense long and short spines near outer margin; outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'36"N 98°24'21"E, 28 Jul 2002 (1♂, genitalia slide NP404).

Remarks. Specimen was collected during the rainy season at 947 m in montane evergreen forest.

Grapholita sp. B

Figs. 27.2, 73.4, 73.5, 96.3

Description. *Head*: Lower frons white to yellowish white; upper frons yellowish white; labial palpus with first, second and apical segment yellowish white; vertex yellowish grey mixed with light brown.

Thorax: Pronotal collar, tegulae and mesonotum brownish grey. Forewing (Fig. 27.2): Length 3.68 mm in male (n=1), 4.7 mm in female (n=3); male costal fold absent; termen round, ground color brown to dark brown, with brownish grey basally, costal strigulae large yellowish white, strigulae 1 and 2 absent, strigulae 3-9 singled; basal patch extending from wing base to strigulae 3 and from costa to inner margin, brownish grey with distal margin curve medially, dark brown suffused with ground color; median, postmedian and preterminal fascia indistinct suffused with ground color; inner margin medially with two large dorsum patches, yellowish white extending parallel from inner margin to midwing at discall cell, outer margin without

terminal strigulae. Underside light brown with yellowish white spots on costa. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 73.5): Coremata with a pair of scale-tufts developed laterally, filiform-shaped.

Male genitalia (Fig. 73.4): Tegumen with arms, rather narrowed, widened apically, dense long setae apicolateral half; uncus and socii absent; gnathos arising from middle of tegumen length, sclerotized basally; anellus closely surrounding basal 1/3 of aedeagus; aedeagus rather short, widened basally, slightly narrowed to apex; cornuti dense, located apically of aedeagus; sacculus with group of dense, moderately long setae basally, ventromedial margin sparsely setose, median with sparse, short and long setae between basal opening and neck, dorsal sparsely setose towards cucullus, neck deeply incised ventrally; cucullus broad, suboval-shaped, dense long and short spines mixed with sparsely setose; posterior surface of valva with large patch of dense microtrichia.

Female genitalia (Fig. 96.3): Sternum VII with large sclerotized plate, posterior margin concaved medially, moderately dense scales, becoming more dense towards posterior margin; tergum VIII sparsely scaled, triangular lateral extensions moderately dense scales at tip; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced forming narrowed sclerotized ring, smooth rim; lamella postvaginalis fused with lamella antevaginalis laterally forming large band, densely microtrichiate and moderately dense scales; ostium bursae rounded, antrum forming short cup-shaped; ductus bursae with sclerotized ring, rather narrowed posteriorly; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae small without signa, with large acessory bursae arising from posterior 1/3 of ductus bursae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP460), 14°39'02"N

98°31'40"E, 23 Aug 2003 (1♂, genitalia slide NP683), 14°40'03"N 98°36'07"E, 21 Sep 2003 (1♀), 14°41'43"N 98°37'34"E, 22 Oct 2003 (1♀, genitalia slide NP684).

Remarks. Specimens were collected during the rainy season at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Grapholita sp. C

Figs. 27.3, 73.6, 73.7, 96.4

Description. *Head*: Lower frons orange white, upper frons brown with each scales becoming paler basally; labial palpus with first segment yellowish white, second segment yellowish white to pale orange with light brown to brown apically, medial with dark spot; vertex light brown.

Thorax: Pronotal collar light brown to brown; tegulae light brown to brown: mesonotum light brown to brown intermixed with greyish orange. Forewing (Fig. 27.3): Length 5.42 mm in male (n=8), 6.11 mm in female (n=16); male costal fold absent; termen straight; ground color light brown; costal strigulae yellowish white, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal fascia indistinct, subbasal fascia present as indistinct strip, brown mixed with dark brown extending from costa to inner margin; median fascia extending irregular obliquely from costa to inner margin near tornus, brown intermixed with brownish orange; postmedian fascia present as dark brown spot on costa with brown striae extending to R_4, middle of inner margin with large rhomboidal patch greyish yellow extending from inner margin to mid wing, strigulae 5 with grey striae extending obliquely from costa to R_5, interfascia between strigulae 5 and 6 with brown striae extending obliquely from costa to R_5, strigulae 7 with silvery grey striae extending obliquely from costa to R_5; wing apex dark brown; ocellus region with light brown patch containing dark brown dashes extending from R_5 to tornus, bordered with light brown patch outer margin with distinct dark brown line broken by yellowish white strigulae between R_5 and M_1, CuA_1 and CuA_2. Underside light brown with yellowish

white spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Abdomen (Fig. 73.7): Coremata with two groups of scale-tufts laterally, one smaller group at anterior end of lever, one larger group at posterior end of lever, long, lanceolate-shaped.

Male genitalia (Fig. 73.6): Tegumen subtriangular with arms, narrowed, scaleless; uncus and socii absent; gnathos arising from midlength of tegumen, sclerotized band, disconnected medially; caulis moderately long; anellus closely surrounding basal of aedeagus; aedeagus long and slender, slightly narrowed to apex; cornuti absent; sacculus with group of moderately long, dense setae basally, ventrobasal margin sparsely setose becoming dense towards small lobe ventromedially, ventromedial lobe with single short, stout spine close to neck, median with long, dense setae, dorsal with group, densely setose; neck short with dorsal margin sclerotized, ventral deeply incised; cucullus large, suboval-shaped, dense spines along margin, extending towards neck near dorsal margin, except ventral margin with sparse short setae, with lobe, tubular-like dorsobasally, extending over neck.

Female genitalia (Fig. 96.4): Sternum VII moderately large sclerotized plate, densely scaled, posterior margin concaved medially; tergum VIII without scales or setae, triangular lateral extensions densely scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; ostium bursae covered by sternum VII; lamella antevaginalis forming swollen wall, widened, along posterior margin of sternum VII, smooth rim, lamella postvaginalis reduced forming two patches of dense scales, antrum forming a wide, sclerotized funnel-shaped; ductus bursae sinuated medially, anterior 2/3 moderately sclerotized; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae with two distinct unequal signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°35'08"N 98°38'20"E, 18 Apr 2002 (1♂, genitalia slide NP316, 1♀, genitalia slide

NP319), 14°41'39"N 98°24'10"E, 19 Apr 2002 (2♂, genitalia slide NP330, NP331), 14°33'51"N 98°37'58"E, 23 Apr 2002 (1♂, genitalia slide NP354), 14°33'12"N 98°34'33"E, 7 May 2002 (1♀, genitalia slide NP392), 14°41'27"N 98°27'29"E, 14 May 2002 (2♂, genitalia slide NP401, 9♀, genitalia slide NP432, NP465), 14°41'43"N 98°27'34"E, 15 May 2002 (2♂, genitalia slide NP543, NP517, 4♀, genitalia slide NP549, NP434, NP544), 19 Feb 2004 (1♀, genitalia slide NP706).

Remarks. Specimens were collected during the winter season and the summer season at 255-1,020 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Grapholita sp. D

Figs. 27.4, 96.5

Description. *Head*: Lower frons yellowish white, upper frons dark brown; labial palpus with first segment yellowish white mixed with greyish orange, second segment greyish orange with light brown spots medially, dorsoapically dark brown, apical segment dark brown, vertex brown.

Thorax: Pronotal collar dark brown with greyish orange apices; tegulae basal half dark brown with greyish orange, apical half dark brown with each scale paler basally; mesonotum anterior half with short scales dark brown with greyish orange apices, posterior half dark brown with each scales paler basally; mesonotum with short scales anterior half, posterior half longer, dark brown with greyish orange apices. Forewing (Fig. 27.4): Length 6.09 mm in female (n=2), termen round; ground color brown to dark brown intermixed with greyish orange; costal strigulae orange white, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal and subbasal fascia suffused with ground color; median fascia extending obliquely from costa to R_5, interfascia between strigulae 5 and 6 with brown striae extending obliquely from costa to outer margin, strigulae 6 with silvery grey striae extending obliquely from costa to outer margin at R_5; ocellus region with irregular patch, greyish orange, between R_4 to between CuA_1 and CuA_2, containing irregular dark brown strip;

outer margin with greyish orange line, terminal strigulae absent. Underside brown with yellowish white spots on costa. Hindwing brown dorsally with scales between CuA_2 and CuP basally, light brown ventrally.

Female genitalia (Fig. 96.5): Sternum VII with large sclerotized plate, posterior margin rounded, slightly concaved medially, densely scaled; tergum VIII sparsely scaled and setose posterolaterally, triangular lateral extensions moderately dense scales and sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis laterally, forming moderately large plate, dense microtrichia with ostium bursae opening medially, anterior margin with dense microtrichia, posterior margin fused with plate, antrum forming small, sclerotized cup; ductus bursae slightly enlarged posteriorly, with sclerotized plate posterior 1/4; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae with two moderately long signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP410), 14°35'08"N 98°38'20"E, 15 Jun 2002 (1♀, genitalia slide NP474).

Remarks. Specimens were collected during the summer season at 360-742 m in dry evergreen forest and hill evergreen forest.

Grapholita sp. E

Figs. 27.5, 74.1, 74.2, 96.6

Description. *Head*: Lower frons yellowish white, upper frons suppressed, light brown to brown; labial palpus with first segment light brown mixed with yellowish white, second segment yellowish white to yellowish grey, with light brown to brown apically, apical segment light brown; vertex light brown to brown.

Thorax: Pronotal collar brown with some scales greyish orange apices; tegulae dark brown with greyish orange apices; mesonotum brown to dark brown with greyish

orange apices. Forewing (Fig. 27.5): Length 6.34 mm in male (n=3), 6.50 mm in female (n=1); male costal fold absent, termen slightly concave between wing apex and M_2; ground color light brown to brown intermixed with greyish orange; costal strigulae yellowish white, strigulae 1-4 double paired and separated by dark brown, strigulae 5-7 paired and separated by dark brown, strigulae 8 and 9 single; basal and subbasal fascia indistinct suffused with ground color; median fascia distinct extending irregular obliquely from costa to inner margin near tornus, brown; interfascia between strigulae 5 and 6 with indistinct striae extending obliquely from costa to R_5 near outer margin, outer margin with dark brown striae broken by yellowish white strigulae between R_5 and M_1. Underside brown to dark brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, becoming paler basally, light brown ventrally.

Abdomen (Fig. 74.2): Coremata with group of scale-tufts laterally, moderately long, lanceolate-shaped.

Male genitalia (Fig. 74.1): Tegumen subtriangular, with arms moderately broad, without scales or setae; uncus and socii absent; gnathos arising from near midlength of tegumen, sclerotized basally; caulis long; anellus closely surrounding basal of aedeagus; aedeagus long, basal 1/4 widened, abruptly narrowed apical 3/4; cornuti absent; sacculus with group of moderately dense, long setae basally, ventromedial margin angled, median with sparse, moderately long and short setae between basal opening and neck; neck deeply incised ventrally, short, without scales or setae; cucullus suboval-shaped, sparsely setose, with dense long to short spiniform setae along near outer margin, outer margin with row of moderately dense, curved setae.

Female genitalia (Fig. 96.6): Sternum VII with moderately large, sclerotized plate, densely scaled, lateral margin and part of anterior margin strongly sclerotized, posterior margin concaved medially; tergum VIII with moderately dense scales posteriorly, triangular lateral extensions moderately dense scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis

reduced, lamella postvaginalis forming widened strip, curved medially, dense microtrichia and scales, sparsely setose; ostium bursae covered by sternum VII, antrum forming a wide, sclerotized cup; ductus bursae moderately long, with sclerotized plate at posterior end; ductus seminalis arising from near initial of sclerotized plate; corpus bursae with two signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (3♂, genitalia slide NP337, NP338, NP339, 1♀, genitalia slide NP340).

Remarks. Specimens were collected during the summer season at 195 m in mixed deciduous forest.

Grapholita sp. F

Figs. 27.6, 74.3, 74.4

Description. *Head*: Lower frons white to orange white, upper frons with long scales, light brown to brown; labial palpus with first segment orange white, second segment orange white mixed with light brown to brown apically, apical segment long, dark brown; vertex light brown to brown.

Thorax: Pronotal collar brown, greenish yellow when viewed at angle to light; tegulae brown basally; mesonotum light brown mixed with brown, greyish yellow anteriorly when viewed at angle to light. Forewing (Fig. 27.6): Length 6.09 mm in male (n=1); male costal fold absent, termen rather straight, ground color light brown to brown, costal strigulae white, strigulae 1-3 indistinct, strigulae 4-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal patch distinct between wing base and median fascia, distal margin extending obliquely from costa to near tornus, light brown basally, becoming darker to dark brown apically, apical 1/3 of wing length light brown to dark brown, dorsum margin with four lines medially, orange grey, projecting curved outwardly; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside brown, with white spots on costa

and outer margin between veins. Hindwing brown dorsally, with hyaline area between Cu and 1A+2A, ventral light brown to brown, except basally.

Abdomen (Fig. 74.4): Sternum VIII wide, subrectangular. Coremata with a pair of large pocket, sligthly sclerotized, with long scale-tufts along inner margin, filiform-shaped.

Male genitalia (Fig. 74.3): Tegumen subtriangular, with arms, moderately broaded, apex forming rounded lobe, scaleless; uncus and socii absent; gnathos arising from near midlength of tegumen, band-like, moderately widened, sclerotized; caulis moderately long; anellus surrounding base of aedeagus; aedeagus moderately long, widened, slightly narrowed to apex; cornuti dense; juxta triangular; sacculus subrectangular, with group of dense, moderately long setae basally, ventromedially with widened lobe, rounded, with sparse setae on ventromedial margin, median with sparse to moderately dense, long and short setae between basal opening and neck, dorsal sparsely setose, anterior surface densely trichiate; neck short, deeply incised ventrally; cucullus large, subovate, rotated basally, sparsely setose, with dense, long and short spines along ventral marginal area, ventral margin with row of moderately dense, curved setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♂, genitalia slide NP570).

Remarks. Specimen was collected during the winter season at 742 m in montane evergreen forest.

Karacaoglania Koçak, 1981

Karacaoglania Koçak, 1981, Priamus 1: 115. [replacement name for *Diacantha*].

Diacantha Diakonoff, 1976, Zool. Verh. Leiden 144: 42. Type species: *Laspeyresia xerophila* Meyrick, 1939. [preoccupied].

The genus includes only 1 species worldwide that has been described from the Oriental region (Brown, 2005).

Unplaced *Karacaoglania*

Karacaoglania sp. A
Figs. 27.7, 74.5, 97.1

Description. *Head*: Lower frons light brown to brown, upper frons brown to dark brown, labial palpus with first segment light brown intermixed with yellowish white, apical segment brown; vertex dark brown.

Thorax: Pronotal collar, tegulae and mesonotum dark brown. Forewing (Fig. 27.7): Length 4.27 mm in male (n=9), 4.30 mm in female (n=1); male costal fold absent, termen round; ground color brown; costal strigulae white to yellowish white, strigulae 1-4 indistinct, strigulae 5-8 paired and separated by dark brown, strigulae 9 singled; basal and subbasal fascia indistinct suffused with ground color; median fascia extending obliquely from costa to R vein, dark brown; postmedian fascia extending obliquely form costa to R_5 near outer margin, dark brown, preterminal fascia extending obliquely from costa to outer margin at R_5, ocellus region with dark brown dashes extending form between R_5 and M_1 to tornus, surrounding with silvery scales when viewed at angle to light, fringe scales on outer margin with dark brown band close to outer margin imaginated with yellowish white scales near wing apex. Underside light brown with yellowish grey spots on costa. Hindwing light brown dorsally, ventrally light brown.

Male genitalia (Fig. 74.5): Tegumen with narrowed arms, slender, subtriangular, scaleless, apicolaterally with group of long setae; uncus and socii absent; gnathos arising from near apex, narrowed band, moderately sclerotized; anellus closely surrounding basal 1/3 of aedeagus; aedeagus long and slender, curved medially, slightly tapered to apex; cornuti absent; sacculus with short, moderately dense setae between ventrobasal margin and cucullus, medial area with sparse setae

Karacaoglania sp. B

Figs. 27.8, 75.1, 75.2

Description. *Head*: Lower frons light brown intermixed with yellowish white, upper frons brown; labial palpus with first segment brown, second segment light brown, apical segment brown; vertex light brown to brown.

Thorax: Pronotal collar brown; tegulae brown to dark brown; mesonotum brown to dark brown. Forewing (Fig. 27.8): Length 4.36 mm in male (n=3); male costal fold absent; termen concaved between wing apex and CuA_1; ground color light brown to brown; costal strigulae white, strigulae 1 and 2 indistinct, strigulae 3, 4 and 7 paired and separated by dark brown , strigulae 5, 6 and 9 singled, strigulae 8 absent ; basal fascia indistinct, subbasal fascia extending obliquely from costa to midwing, angled and extending obliquely to inner margin, dark brown; median fascia extending obliquely form costa to inner margin near tornus, dark brown, between base of R_4 and M_1 with brownish orange spots, interfascia between strigulae 5 and 6 with brownish grey striae extending obliquely from costa to tornus, silvery when viewed at angle to light; ocellus region with row of dark brown dashes extending from R_4 to tornus; wing apex brownish orange; outer margin with terminal strigulae, brownish orange between R_5 and M_1. Underside light brown with yellowish white spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 75.2): Coremata with a pair of long, scale-tufts laterally, lanceolate-shaped.

Male genitalia (Fig. 75.1): Tegumen subtriangular with arms, narrowed, apicolaterally with membranous lobe, with long, dense scales beneath lobe; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, narrowed band-like, membranous; anellus closely surrounding basal 1/5 of aedeagus; aedeagus long and slender; cornuti absent; sacculus with sparsely setose on ventral margin, median with sparsely setose between basal opening and neck, dorsal with sparse setae, posterior

surface with large patch of very long, dense scales; neck slightly concaved, sparsely setose; cucullus short, rounded lobe, dense spines and sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°24'34"E, 11 Jun 2002 (1♂, genitalia slide NP531), 14°39'02"N 98°31'40"E, 30 Sep 2002 (1♂, genitalia slide NP487), 14°41'38"N 98°24'17"E, 15 Jul 2003 (1♂, genitalia slide NP598).

Remarks. Specimens were collected during the rainy season at 990-1,040 m in hill evergreen forest.

Leguminivora Obraztsov, 1960

Leguminivora Obraztsov, 1960, Tijdschr. Ent. 103: 129. Type species: *Grapholitha glycinivorella* Matsumura, 1989.

Leguminivora has been defined by the following characters; small-sized with indistinct wing pattern, brown to dark brown densely irrorated with white, with whitish costal strigulae, obvious ocelloid patch and faint dorsal blotch. The labial palpus is moderately long and moderately wide, sinuate and slightly upcurved. In the male hindwing with 3A approximated to the thickened anal margin which is rolled upwardly to form an anal fold with modified cilia, enclosing a hairpencil from the base of the anal margin. The genus is characterized by a male scent organ consisting of a pair of scale tufts from pocket in the pleuro-posterior region of an invaginated plate covered with numerous scales between abdominal segment 8 and 9. The male genitalia are characterized by a dorsolaterally widened, subrectangular, flat-topped tegumen, the socii a pair of long hairpencils with converging tips and their bases from a concavity of the dorsolateral expansion of tegumen, narrow gnathos arms arising just below the top of the tegumen and running laterally along the subscaphium as strongly concave near its base and forms an angular ridge, and a long, slender aedeagus, strongly curved in basal half and somewhat bulbous subbasally. The female genitalia are characterized by slender ovipositor lobe with a short posterior lobe, a

long ductus bursae widened below inception of ductus seminalis with distal half transversely wrinkled and ending in a strongly sclerotized funnel-or tube-shaped sterigma, and a corpus bursae with a diverticulum and two horn-shaped signa. The genus includes 4 species worldwide and is most diverse in the Oriental region. *Leguminivora* includes 2 species have been described from Southeast Asia (Brown, 2005). Obraztsov (1967) noted that *L. glycinivorella* has been bred from larva webbing flower of mango (Anacardiaceae).

Unplaced *Leguminivora*

Leguminivora sp. A

Figs. 28.1, 97.2

Description. *Head*: Lower frons difficult to defined, upper frons light brown with pale yellow apices; labial palpus with first segment yellowish white to pale yellow, second segment pale yellow with light brown patch dorsomedially, apical segment brown mixed with yellowish white; vertex brown to dark brown with yellowish white apices.

Thorax: Pronotal collor dark brown with yellowish white apices; tegulae brown to dark brown with yellowish whith apices; mesonotum difficult to defined. Forewing (Fig. 28.1): Length 5.63 mm in female (n=1); termen slightly concaved between wing apex and M_2; ground color yellowish white; costal strigulae yellowish white, strigulae 1 indistinct, strigulae 2-9 paired and separated by dark brown except strigulae 8 singled, basal fascia absent; subbasal fascia with wide strip extending obliquely from costa to midwing fused with median fascia at midwing, dark brown; median fascia extending from costa to midwing, dark brown, strigulae 3 and 4 with grey striae extending from costa to R vein, strigulae 5 with grey striae extending oblique distinctly from costa to R_5 and extending irregularly to tornus, pretornal subtriangular spot indistinct on distal margin extending from inner margin to midwing at base of CuA_1, dark brown; postmedian fascia present as dark brown spot on costa and extending obliquely as light brown strip to outer margin containing brown to dark

brown strip between R_3 and outer margin, strigulae 7 with grey striae extending obliquely from costa to outer margin at R_5; ocellar region with brownish orange patch from M to between CuA_1 and CuA_2 wih two dark brown spots, and transverse grey strip beyond patch between M_1 and CuA_2 near outer margin; outer margin with terminal strigulae, yellowish white between R_5 and M_1. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, ventral light brown.

Female genitalia (Fig. 97.2): Sternum VII membranous to weakly sclerotized, densely scaled, with small sclerotized plate anteromedially, deeply concaved medially; tergum VIII posteriorly with sparsely setose, triangular lateral extensions with sparsely setose; papillae anales narrowed, densely setose, lateral setae without papillose bases; ostium bursae rounded, present close to anteromedial margin; lamella antevaginalis reduced; lamella postvaginalis developed, forming elongate groove, sclerotized, rather narrowed, covered by sclerotized plate posterior 1/6, posterior end rounded, antrum forming a short, sclerotized cup, colliculum small, weakly sclerotized; ductus seminalis arising from anterior 1/3 of ductus bursae, with small sclerotized plate at anterior end; corpus bursae with moderately large diverticulum near anterior end, two blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'31"N 98°24'27"E, 13 May 2002 (1♀, genitalia slide NP368).

Remarks. Specimen was collected during the summer season at 954 m in hill evergreen forest.

Leguminivora sp. B

Figs. 28.2, 97.3

Description. *Head*: Lower frons orange white, upper frons light brown; labial palpus with first segment orange white, second segment pale orange mixed with

greyish orange to brownish orange apically, apical segment greyish orange; vertex light brown to brown, each scales with orange white apices.

Thorax: Pronotal collar brown; tegulae and mesonotum brown with each scale orange white apices. Forewing (Fig. 28.2): Length 4.45 mm in female (n=9); termen concaved between R_5 and M_1; ground color light brown with mostly scales orange white apices; strigulae 1-5 paired and separated by dark brown, strigulae 6-9 singled; basal fascia absent; subbasal fascia distinct extending outward obliquely from costa to middle of wing, angled and extending inwardly to inner margin, brown mixed with dark brown; median fascia distinct extending diagonally from costa to R, angled and extending enlarged to inner margin near tornus, brown to dark brown with some scales orange white apices, area between subbasal and median fascia on inner margin with two parallel lines, curved outwardly to middle of wing, orange white, strigulae 3 with grey striae extending diagonally to middle of wing, strigulae 5 with grey striae extending obliquely from costa to R_5 and straight to tornus, strigulae 7 and 9 with short grey striae; ocellus region with 4 dark brown dashes between R_5 and CuA_1; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside light brown with orange white spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 97.3): Sternum VII subtriangular, rather small, sclerotized plate, posterior margin deeply concaved medially, anterior margin with transversely ridge, curved, sclerotized; tergum VIII and triangular lateral extensions sparsely setose; papillae anales narrowed, densely setose, without papillose bases; anterior apophyses distinct, long and narrowed; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae covered by sternum VII, present near anterior margin medially, antrum forming small, cup-like; ductus bursae with anterior 1/3 sclerotized; ductus seminalis arising from near posterior 1/3 of ductus bursae; corpus bursae with small diverticulum anteriorly, with two large signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 18 Jan 2004 (1♀, genitalia slide NP614), 14°41'32"N

98°24'17"E, 19 Jan 2004 (1♀, genitalia slide NP695), 14°41'43"N 98°27'34"E, 19 Feb 2004 (2♀, genitalia slide NP694, NP696), 20 Feb 2004 (5♀, genitalia slide NP697, NP743).

Remarks. Specimens were collected during the winter season at 180-965 m in mixed deciduous forest and hill evergreen forest.

Microsarotis Diakonoff, 1982

Microsarotis Diakonoff, 1982, Zool. Verh. Leiden 193: 10. Type species: *Laspeyresia palamedes* Meyrick, 1916.

Microsarotis has been defined by the following characters; small-sized, rather broad wing dark grey moths with, irridescent scales on body and forewing, with large black and white costal strigulae, a dorsal blotch of bent, parallel, silvery lines framed by black, the ocelloid patch a broad leaden band without black dashes and the termen without notch. The genus has a rather small head with smallish, upcurved, weakly sinuate, yellowish white labial palpi with a crescentic second segment. The venation is characterized by a forewing with chorda and M-stem well-developed. The male has unique scent organs consisting of two large scales tufts deeply invagianted between a curved, very narrow tergum 8 and a modified tergum 7 with scaled pockets on outer surface and a small bipronged median sclerite on inner surface. The male genitalia are diagnostic with a narrow, distally tapering tegumen topped by a large, round or transversely ovate disc, strongly swollen, short, ovate to triangular valvae with small basal excavation, a strongly convex outer surface and the inner surface with a dense patch of strong bristles and a rounded-triangular naked apex except for deciduous, flattened bristles, the aedeagus tapering towards apex with vesica irregularly sclerotized in proximal half. The female genitalia also are diagnostic with the cup to funnel-shaped sterigma fused with sternum 7 beneath its posterior apex, the ductus bursae bipartile, narrow posteriorly and widened anteriorly, with two large, confluent patches of dorsal sclerotization below ductus seminalis, and the corpus bursae with two long, slender, curved, horn-shaped signa (Diakonoff, 1982). The genus includes 3

species worldwide. *Microsarotis* includes 2 species have been described from the Oriental region (Brown, 2005). Fletcher (1932) reported that *M. palmedes* had been rared in India from larvae on tamarind leaves (*Tamarindus* L., Caesalpiniaceae) and in flower-buds of *Bauhinia purpurea* L. (Caesalpiniaceae).

Microsarotis lucida (Meyrick), 1916
Figs. 28.3, 75.3, 75.4, 97.4

Laspeyresia lucida Meyrick, 1916, Exotic Microlepid. 2: 22. Type locality: India (Coimbatore). Lectotype (♀): BMNH.

Description. *Head*: Lower frons yellowish white, upper frons greyish yellow; labial palpus with first segment yellowish white; second segment pale yellow; apical segment pale yellow; vertex light brown to brown.

Thorax: Pronotal collar brown; tegulae light brown to brown; mesonotum brown. Forewing (Fig. 28.3): Length 4.68 mm in male (n=2), 4.75 mm in female (n=2); male costal fold absent, termen rounded, ground color light brown basally to brown apically, costal strigulae white to yellowish white, strigulae 1 and 2 indistinct, strigulae 3, 4, 5 and 7 paired and separated by dark brown, strigulae 6, 8, and 9 singled, basal patch indistinct suffused with ground color, median fascia distinct present as dark brown line extending obliquely from costa to R vein, pointed and extending obliquely to inner margin; postmedian fascia extending obliquely from costa to outer margin, dark brown, strigulae 5 with grey striae extending obliquely from costa to M_1, angled and extending to tornus, strigulae 7 with grey striae extending from costa, curved to outer margin; dorsum patch present as 4 transverse lines, yellowish grey, extending outward obliquely from costa to midwing, bordered by dark brown line, pretornal subtriangular spot, dark brown, extending from inner margin to M_3; outer margin with distinct dark brown striae, without terminal strigulae. Underside light brown with white spots on costa. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 75.4): Tergum VIII with anterior margin forming narrowed sclerotized band, posterior margin froming sclerotized band with two sharp hooks ventromedially. Coremata with a pair of scale pocket beneath tergum VIII, containing scale-tufts, long and narrow lanceolate-shaped.

Male genitalia (Fig. 75.3): Tegumen rather narrow, triangular, rounded at apex, without scales or setae; uncus and socii absent; gnathos arising from basal 1/4 of tegumen, slightly sclerotized; anellus surrounding basal half of aedeagus; aedeagus long, widened, apical 1/3 narrowed, with dense, short cornuti medially; valva large, oval-shaped, enlarged to apex, rounded at apex; sacculus with sparse setae, moderately long basally and ventrobasal margin, median with moderately dense setae on basal opening area, dorsal sparsely setose; cucullus with large group of short to long spines medially, basal and apical area with sparse setae, posterior surface with moderately scales, becoming more dense towards margins.

Female genitalia (Fig. 97.4): Sternum VII moderately large, slightly sclerotized plate, densely scaled throughout, posterior margin with round lobe medially, protuding posteriorly, scaleless; tergum VIII sparsely setose posterolaterally, triangular lateral extensions with sparse setae; papillae anales densely setose, lateral setae with papillose bases; ostium bursae behind sternum VII, antrum funnel-shaped, membranous; ductus bursae with long, moderately sclerotized plate medially; ductus seminalis arising close to corpus bursae opening; corpus bursae large, narrowed near posterior half, with large sclerotized plate posterior 1/4, with group of moderately dense denticles; corpus bursae with two signa, thorn-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Aug 2002 (1♂, genitalia slide NP395), 14°32'37"N 98°38'46"E, 23 Aug 2002 (1♀, genitalia slide NP383), 14°41'27"N 98°27'29"E, 20 Dec 2003 (1♂, genitalia slide NP610), 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP617).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collectd during the rainy season and the winter season at 195-742 m in mixed deciduous forest, dry evergreen forest and montane evergreen forest.

Microsarotis palamedes (Meyrick), 1916
Figs. 28.4, 75.5, 97.5

Laspeyresia palamedes Meyrick, 1916, Exotic Microlepid. 1: 564. Type locality: India (Coimbatora). Holotype (♀): BMNH.

Description. *Head*: Lower frons yellowish white, upper frons light brown to brown; labial palpus with first segment yellowish white, second segment yellowish white to orange white, apical segment orange white with greyish orange apices, vertex dark brown mixed with light brown, metallic greyish green when viewed at angle to light.

Thorax: Pronotal collar, tegulae and mesonotum brown. Forewing (Fig. 28.4): Length 3.97 mm in male (n=5), 4.3 mm in female (n=6); male costal fold absent, termen rounded, ground color light brown to brown, costal strigulae white to yellowish white, strigulae 1-3 indistinct, strigulae 4, 5 and 7 paired and separated by dark brown, strigulae 6, 8 and 9 singled; basal patch suffused with ground color, except distal margin present as dark brown extending longitudinal straight from discal cell to midwing, pointed and extending obliquely to inner margin; median fascia distinct extending outward obliquely from costa to R vein and extending inward obliquely to inner margin; postmedian fascia extending obliquely from costa to R_5, dorsum patch present as 4 transverse oblique lines extending from inner margin to discal cell, yellowish grey, bordered by dark brown line, pretornal subtriangular spot light brown to brown, bordered by dark brown, ocellus region with grey strip extending between tornus and M_1, outer margin with dark brown line, without strigulae. Underside light brown with white spots on costa. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 75.5): Tegumen moderately broad, constricted apical 1/3, dilated apically, rounded at apex, without scales or setae; uncus and socii absent; gnathos arising from basal 1/3 of tegumen, membranous; anellus surrounding basal half of aedeagus; aedeagus long, widened, slightly tapered to apex, with dense, short cornuti medially; valva large, subtriangular, enlarged to apex, apex truncated and slightly concaved medially; sacculus with group of short setae basally, with moderately dense setae along ventrobasal margin towards cucullus ventrally, median with moderately dense setae on basal opening area; cucullus with large group of short to long spines extending obliquely from dorsoapical area to ventromedially, ventroapical area with sparse setae, valva with dense scales on apicoposterior surface 2/3.

Female genitalia (Fig. 97.5): Sternum VII moderately large, slightly sclerotized plate, narrowed posteriorly, sparsely scaled, becoming more dense towards posterior margin, anteromedial area scaleless, posterior margin with subtriangular lobe protuding posteriorly, scaleless; tergum VIII sparsely setose posterolaterally, triangular lateral extensions with sparse setae; papillae anales densely setose, lateral setae with papillose bases; ostium bursae behind sternum VII, antrum funnel-shaped, membranous; ductus bursae with sclerotized plate posteriorly, rather short; ductus seminalis arising near corpus bursae opening; corpus bursae large, constricted posterior 1/3, with large sclerotized plate posteriorly and row of dense denticles longitudinally; corpus bursae with two signa, thorn-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (1♂, genitalia slide NP343), 25 Oct 2003 (1♀, genitalia slide NP609), 14°41'43"N 98°27'34"E, 22 Nov 2003 (1♀, genitalia slide NP611), 19 Feb 2004 (2♂, genitalia slide NP615, 1♀), 20 Feb 2004 (1♂, genitalia slide NP616), 14°40'03"N 98°36'07"E, 18 Jan 2004 (1♀, genitalia slide NP708), 14°41'17"N 98°24'02"E, 21 Feb 2004 (1♂, genitalia slide NP709, 2♀).

Distribution. Thailand (new record) and India.

Remarks. Specimens were collected throughout the year at 180-1,040 m in mixed deciduous forest and hill evergreen forest.

Pammene Hübner, [1825] 1816

Pammene Hübner, [1825] 1816, Verz. Bekannter Schmett.: 378. Type species: *Tortrix trauniana* [Denis & Schiffermüller], 1775.

Palla Billberg, 1820, Enum. Insect.: 90. Type species: *Phalaena rhediella* Clerck, 1759. [preoccupied].

Hemimene Hübner, [1825] 1816, Verz. Bekannter schmett.: 378. Type species: *Tortrix ephippana* Hübner, [1817].

Eucelis Hübner, [1825] 1816, Verz. Bekannter Schmett.: 394. Type species: *Tortrix mediana* [Denis & Schiffermüller], 1775.

Psuedotomia Stephens, 1829, Syst. Cat. Br. Insects: 46. Type species: *Phalaena (Tortrix) strobilella* Linnaeus *sensu* Stephens, 1829 [=*Tortrix argyrana* Hubner, [1796-1799]].

Heusimene Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 96. Type species: *Tortrix fimbriana* Haworth, [1811].

Encelis Stephens, 1834, Illust. Br. Ent. (Haustellata) 4: 105. [misspelling of *Eucelis*].

Pyrodes Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 187. Type species: *Phalaena rhediella* Clerck, 1759. [preoccupied].

Trycheris Guenée, 1845, Annls Soc. Ent. Fr. (2) 3: 190. Type species: *Tortrix mediana* [Denis & Schiffermüuller], 1775.

Orchemia Guenée, 1845, Ann. Soc. Ent. Fr. (2) 3: 192. Type species: *Orchemia gallicana* Guenée, 1845.

Hemerosia Stephens, 1852, List Specimens. Br. Anim. Colln. Br. Mus. 10: 60. Type species: *Phalaena rhediella* Clerck, 1759. [replacement name for *Palla* and *Pyrodes*].

Halonota Stephens, 1852, List Specimens. Br. Anim. Colln. Br. Mus. 10: 45. Type species: *Pyralis populana* Fabricius, 1787.

Phthoroblastis Lederer, 1859, Wien. Ent. Monatschr. 3: 370. Type species: *Pyralis populana* Fabricius, 1787.

Sphaeroeca Meyrick, 1895, Handbook Brit. Lepid.: 490. Type species: *Pseudotomia obscurana* Stephens, 1834. [preoccupied].

Pamene Rebel, 1910, in Staudinger & Rebel, Cat. Lepid. Pal. Faun. (2): 123. [misspelling of *Pammene*].

Metasphaeroeca Fernald, 1908, Genera Tortricidae Types: 62. Type species: *Pseudotomia obscurana* Stephens, 1834. [replacement name for *Sphaeroeca*].

Eucells Caradja, 1916, Dt. Ent. Z. Iris 30: 86. [misspelling of *Eucelis*].

Hemene Pierce & Metcalfe, 1935, Genitalia Tineid Families Lepid. Br. Is: 114. [misspelling of *Hemimene*].

Pammene has been defined by the following characters; very small to medium-sized moth. Forewing usually with well-defined white dorsal blotch or whitish median fascia, and well defined ocelloid patch. Male hindwing usually with $Sc+R_1$ and Rs fused before or beyond outer edge of discal cell. On upper surface of male hindwing, a narrow androconial field consisting of modified scales present along

$Sc+R_1$ and Rs. Tergum 6 and 7 of male with a transverse patch of modified scales. Coremata reduced. In male genitalia, valva with sacculus occasionally bearing two to nine spines in a cluster or a patch of hairs; aedeagus abruptly narrowed at apical 1/3 where sometime it is swollen; caulis usually very short. The female genitalia are characterized by a sterigma formed by a rectangular plate with a raised rim anteriorly and laterally, rather short ductus bursae with a cone-shaped sclerotized ring anteriorly, and the wide seventh sternite usually with a pair of triangular or rounded concavities laterally (Kuznetsov, 1987; Komai, 1999). The genus includes 119 species worldwide. *Pammene* includes 5 species have been described from the Oriental region (Brown, 2005). Many plant families are utilized as larval host plants: Ginkgoaceae, Cupressaceae, Pinaceae, Fagaceae, Betulaceae, Ericaceae, Rosaceae, Myricaceae, Aceraceae, Oleaceae and Umbellifera (Komai, 1999).

Unplaced *Pammene*

Pammene sp. A

Figs. 76.1, 76.2

Description. Wing pattern poorly defined.

Abdomen (Fig. 76.2). Tergum VI with anterior margin sclerotized forming narrow band, with moderately long and slender lobe laterally, bearing dense, long and narrowed scales apically.

Male genitalia (Fig. 76.1): Tegumen with arms, rather narrowed, widened apically; scaleless; uncus and socii absent; gnathos arising from near midlength of tegumen, sclerotized basally, membranous medially; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, abruptly narrowed over apical 1/3; four moderately long cornuti, 1/3 of aedeagus length, located at middle of aedeagus; sacculus with group of moderately long setae basally, median with small lobe along basal opening, bearing dense short setae transversely between dorsal and ventral margin; neck moderately long, sparsely setose on dorsal margin, ventral margin

sclerotized with distinct one spine, slightly curved, moderately long; cucullus broad, subovate, sparsely setose, with dense, long and short spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 30 Sep 2002 (1♂, genitalia slide NP521).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Pammene sp. B

Figs. 28.5, 76.3, 76.4

Description. *Head*: Lower frons yellowish grey, upper frons brown to dark brown; labial palpus with first segment yellowish white, second segment brown intermixed with yellowish white, with dark brown apically, apical segment dark brown; vertex brown to dark brown.

Thorax: Pronotal collar dark brown with yellowish white apices; tegulae dark brown with yellowish white apices; mesonotum brown to dark brown with some scales yellowish white apices. Forewing (Fig. 28.5): Length 3.81 mm in male (n=5); male costal fold absent, termen slightly concave between wing apex and M_2; ground color light brown to brown intermixed with diffuse white scales, costal strigulae white, strigulae 1-6 paired and separated by dark brown, strigulae 7-9 single; basal patch indistinct extending from wing base to strigulae 3 and from costa to inner margin, brown to dark brown intermixed with white scales; median fascia indistinct extending obliquely from costa to inner margin, brown to dark brown; interfascia between strigulae 5 and 6 with brown striae extending obliquely from costa to outer margin at between M_1 and M_2, with dark brown line inside between R_3 and outer margin; strigulae 6 with silvery grey striae extending obliquely from costa to outer margin between R_5 and M_1; postmedian fascia indistinct, wing apex with short transverse lines, dark brown extending from R_4 and R_5, near outer margin between M_2 and CuA_2 with three dark brown spots between veins; ocellus region with transverse brown strip

extending from inner margin to M_1, surrounding with silvery grey scales, outer margin without terminal strigulae. Underside light brown with large dark brown spot medially, with yellowish white spots on costa. Hindwing brown to dark brown dorsally, vertral light brown.

Abdomen (Fig. 76.4): Tergum VI with anterior margin sclerotized forming narrow band, with moderately short, rounded lobe laterally, bearing dense, lanceolate-shaped scales apically.

Male genitalia (Fig. 76.3): Tegumen with arms, moderately broad, scaleless; uncus and socii absent; gnathos arising from midlength of tegumen, band-like, sclerotized and narrowed basally; anellus closely surrounding basal 1/3 of aedeagus; aedeagus moderately long, slightly narrowed to apex; four cornuti, moderately long 1/3 of aedeagus, located at middle of aedeagus; juxta triangular, rounded ventrally; valva deeply concaved ventromedially forming neck, without scales or setae; sacculus with group of short, moderately dense setae basally, median with group of short, dense setae between basal opening and ventral margin; cucullus subtriangular, rounded at apex, sparsely setose, dense short and long spines along near outer marginal area, dorsal margin sparsely setose, ventrobasally with distinct single spine, straight, moderately long.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP527), 14°39'02"N 98°31'40"E, 23 Aug 2003 (2♂, genitalia slide NP612), 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂), 19 Sep 2003 (1♂, genitalia slide NP626).

Remarks. Specimens were collected during the summer season and the rainy season at 180-745 m in mixed deciduous forest and hill evergreen forest.

Pammene sp. C

Figs. 28.6, 97.6

Description. *Head*: Lower frons yellowish grey, upper frons brown; labial palpus with first segment brownish orange, second segment brownish orange to light brown, apical segment greyish orange; vertex brown.

Thorax: Pronotal collar brown to dark brown; tegulae yellowish white to orange white with dark brown basal 1/3; mesonotum brown to dark brown with orange white transverse strip posterior 1/3, posterior end with orange white scales. Forewing (Fig. 28.6): Length 5.24 mm in female (n=4); termen slightly concave between wing apex and between CuA_1 and CuA_2; ground color greyish orange to brownish orange with yellowish white basally; costal strigulae yellowish white, strigulae 1 and 2 indistinct difficult to defined, strigulae 3-9 paired and separated by dark brown; basal and subbasal fascia indistinct suffused with ground color, basal area present as two spots, brown to dark brown, one near costal margin and the other near inner margin, wing base with dark brown strip on inner margin, mid of inner margin with large sub-semicircular patch, brown extending from inner margin to CuA_2 bordered with orange white scales, wing medially with small brown spot above dorsum patch, beyond dorsum patch with silvery grey spot on inner margin; median fascia indistinct present as indistinct light brown strip extending obliquely from costa to R_3, strigulae 5 with silvery grey striae extending obliquely to R_2 and extending irregularly enlarged to tornus, interfascia between strigulae 5 and 6 with dark brown dash extending obliquely from R_2 to M_2, strigulae 7 with narrow grey striae extending from costa to outer margin at R_5, outer margin with irregular transverse brown line between M_1 and CuA_1. Underside brown to dark brown with yellowish white spots on costa. Hindwing dark brown dorsally, light brown ventrally.

Female genitalia (Fig. 97.6): Sternum VII with large sclerotized plate, densely scaled, becoming more dense towards posterior margin, posterior margin concaved medially; tergum VIII without scales or setae, triangular lateral extensions with moderately dense setae; papillae anales densely setose, lateral setae with papillose

bases; ostium bursae rounded, moderately widened, anteriorly covered by sternum VII; lamella antevaginalis reduced, fused with lamella postvaginalis laterally, lamella postvaginalis forming sclerotized plate, thickened, pointed posterolaterally, dense microtrichia and scales; ductus bursae very short, with sclerotized plate at junction between ductus and corpus bursae; ductus seminalis arising from near anterior end of corpus bursae; corpus bursae with two long signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°34'04"N 98°38'52"E, 22 Apr 2002 (4♀, genitalia slide NP349).

Remarks. Specimens were collected during the summer season at 300 m in mixed deciduous forest.

Pammene sp. D

Figs. 28.7, 98.1

Description. *Head*: Lower frons dark brown, upper frons with long dark brown scales; labial palpus with first segment white, second segment white, orange white dorsally, apical segment orange white; vertex with scales light brown basal half, apical half dark brown mixed with orange white scales posteriorly.

Thorax: Pronotal collar brown to dark brown mixed with orange white, metallic greenish yellow when viewed at angle to light; tegulae greyish orange mixed with orange white basally, metallic greyish green basally when viewed at angle to light; mesonotum brown to dark brown, metallic greyish green when viewed at angle to light. Forewing (Fig. 174): Length 5.50 mm in female (n=1); termen rather straight, ground color greyish brown mixed with white scales apically, costal strigulae white, strigulae 1 and 2 indistinct, strigulae 3-5 and 9 paired and separated by dark brown, strigulae 6-8 singled, subbasal fascia distinct on anal margin, widened, slightly curved extending obliquely to middle of wing, dark brown, surrounding with white scales; median and postmedian fascia extending obliquely to outer margin, dark brown;

ocellus region with brown scales, with two small spots near outer margin between M_2 and tornus; outer margin with distinct dark brown line. Underside light brown with white spots on costa. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 509): Sternum VII with moderately large, sclerotized plate, posterior margin deeply concaved medially, posterolaterally narrowed, pointed, densely scaled; tergum VIII densely scaled posteriorly, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis fused with lamella postvaginalis laterally, forming sclerotized ring, lamella antevaginalis moderately widened, thickened margin, dense microtrichia, smooth medially, lamella postvaginalis extending enlarged and narrowed to posteriorly, dense microtrichia; ductus bursae short, with sclerotized plate, encircled, posterior half of ductus bursae; ductus seminalis arising from anterior end of corpus bursae; corpus bursae with two moderately long, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 21 Dec 2003 (1♀, genitalia slide NP571).

Remarks. Specimen was collected during the winter season at 742 m in montane evergreen forest.

Parapammene Obraztsov, 1960

Parapammene Obraztsov, 1960, Tijdschr. Ent. 103: 125. Type species: *Phthoroblastis selectana* Christoph, 1882.

Diamphidia Obraztsov, 1961, Tijdschr. Ent. 104: 51. Type species: *Pammene petulantana* Kennel, 1901. [preoccupied].

Pammenodes Danilevsky & Kuznetsov, 1968, Fauna USSR (N.S.) 98 (Lepid. 5(1)): 334. Type species: *Pammene glauca* Kennel, 1901.

Mimarsinania Koçak, 1981, Priamus 1: 116. [replacement name for *Diamphidia*].

Diplosemaphora Diakonoff, 1982, Zool. Verh. Leiden 193: 35. Type species: *Diplosemaphora amphibola* Diakonoff, 1982.

Parapammene has been defined by the following characters; very small to small moths with a brownish grey to dark brownish forewing with ochreous irroration, with median fascia usually developed, with an ocelloid patch with reduced or absent outer edge, and without or ill-defined whitish striae below apex. Hindwing venation sexually dimorphic; male hindwing with variable venation. Upper surface of male hindwing usually with narrow or hair-like, modified scales along Sc+R_1 and Rs, sometimes central portion of wing with very small, modified scales. Sternum 2 without anterolateral processes, and tergum 4 and 5 in male sometimes with a transverse band of modified scales or granular spots. In the male genitalia, the tegumen is a broad band with its top laterally emarginated, and the curved or sinuate aedeagus is tapering gradually or abruptly narrowed in distal 1/3-1/2. The female genitalia are characterized by sternum 7, a convex rather than a flat plate and by a narrow, band-like longitudinal sclerite in the proximal part of ductus bursae (Komai, 1999). The genus includes 16 species worldwide. *Parapammene* includes 5 species have been described from the Oriental region (Brown, 2005). The known larvae of *Parapammene* are borers in stem and seeds. Hostplants recorded in the Palearctic region chiefly belong to the Fagaceae, and a few species use Tiliaceae and Aceracece as larval host (Komai, 1999).

Unplaced *Parapammene*

Parapammene sp. A

Figs. 28.8, 76.5, 76.6, 76.7, 98.2

Description. *Head*: Lower frons orange white, upper frons light orange; labial palpus with first segment orange white, second segment orange white to pale orange, apical segment greyish orange; vertex greyish orange.

Thorax: Pronotal collar pale orange; tegulae brownish orange with each scale orange white apices; mesonotum brownish orange with light orange apices. Forewing (Fig. 28.8): Length 5.27 mm in male (n=2), 7.22 mm in female (n=1); male costal fold absent, termen slightly concave between wing apex and M_2, ground color greyish yellow to greyish orange intermixed with indistinct and irregular transverse brownish orange narrow lines; costal strigulae yellowish white strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 singled; basal, subbasal and median fascia suffused with ground color; postmedian fascia indistinct extending obliquely from costa to outer margin at M_1, apical wing 1/4 with large patch, brown to dark brown with diffuse small dark brown spots between costa and tornus, outer margin without terminal strigulae. Underside light brown medially surrounding with pale yellow near margin, costal margin and outer margin without strigulae. Hindwing brown dorsally, greyish orange ventrally.

Abdomen (Fig. 76.6-76.7): Tergum V with anterior margin sclerotized, slightly curved, with two types of dense scales, spatulate-shaped on anterior margin and oval-shaped beyond. Coremata with a pair of scale-tufts, long and narrow.

Male genitalia (Fig. 76.5): Tegumen subtriangular with arms, moderately broad, scaleless, uncus and socii absent; gnathos arising from basal 1/3 of tegumen, membranous; anellus closely surrounding base of aedeagus; aedeagus moderately long, slightly tapered to apex, curved medially; cornuti dense, long 1/3 of aedeagus length, located at middle of aedeagus; juxta triangular, truncated ventrally; sacculus with group of short setae basally, ventrobasal to ventromedial margin with row of moderately long mixed with short setae, dorsal with row of long setae towards cucullus apically; neck deeply incised ventrally, without setae; cucullus small, subtriangular, rounded at apex, dense long and short spiniform setae mixed with long setae, outer margin with sparse setae.

Female genitalia (Fig. 98.2): Sternum VII with large sclerotized plate, densely scaled, sparse setae posteriorly, posterior margin deeply concaved medially; tergum VIII moderately dense scales and sparse setae towards triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis forming sclerotized ring, thickened, smooth rim, fused with lamella postvaginalis laterally, lamella postvaginalis sclerotized plate, extending posteriorly, dense microtrichia; ductus bursae with small cup-shaped antrum, colliculum small, slightly sclerotized, with moderately large sclerotized plate posteriorly, irregular, not encircled, with narrow band-like extending to end of corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two signa, spine-like, dilated basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (2♂, genitalia slide NP420, 1♀, genitalia slide NP486).

Remarks. Specimens were collected during the summer season at 742 m in hill evergreen forest.

Parapammene sp. B

Figs. 29.1, 77.1, 77.2, 98.3

Description. *Head*: Lower frons yellowish white, upper frons brownish grey; labial palpus with first segment light brown, second segment brownish orange mixed with light brown, apical segment dark brown; vertex light brown mixed with orange grey.

Thorax: Pronotal collor light brown; tegulae orange white mixed with brown and dark brown; mesonotum orange white mixed with brown to dark brown.
Forewing (Fig. 29.1): Length 4.88 mm in male (n=2), 5.72 mm in female (n=2); male costal fold absent, termen slightly concaved between wing apex and M_2, ground color yellowish white to orange white; costal strigulae yellowish white, strigulae 1-9 paired

and separated by dark brown; basal patch distinct, incompleted extending from inner margin to mid wing, distal margin extending obliquely from inner margin to M-sterm, pointed, angled, and extending to wing base, dark brown; median fascia present as small dark brown spot on costa; postmedian fascia present as small dark brown spot on costa; preterminal fascia distinct extending obliquely from costa to outer margin at CuA_1, dark brown, inner margin medially with subtriangular dark brown spot extending from inner margin to CuA_2, apical wing 1/4 with large patch, brown mixed with dark brown; outer margin with dark brown line broken by terminal strigulae between R_5 and M_1, $M_1$and M_2, yellowish white, strigulae 10 present as yellowish white spot between R_4 and R_5. Underside light brown with yellowish grey spots on costa and outer margin between veins. Hindwing light brown dorsally, ventral light brown with yellowish white scales on costa.

Abdomen (Fig. 77.2): Sternum IV with a pair of patch, long and moderately large along anterior margin, containing short, densely scaled.

Male genitalia (Fig. 77.1): Tegumen subtriangular with arms, broad, scaleless, uncus and socii absent; gnathos arising from near half of tegumen, membranous; anellus closely surrounding base of aedeagus; aedeagus long, basally widened, slightly tapered to apex, curved medially, with six deciduous cornuti, located at dorsoapical 1/3 of aedeagus; juxta triangular, truncated ventrally; sacculus with group of short, dense setae basally, ventrobasal margin towards neck with sparse setae, medial area with small lobe and group of short setae between basal opening and lobe; neck deeply incised ventrally, sparse setae ventrally, dorsal with row of long setae towards cucullus apically; cucullus small, subtriangular, rounded at apex, dense long and short spiniform setae mixed with long setae, outer margin sparsely setose.

Female genitalia (Fig. 98.3): Sternum VII with large sclerotized plate, densely scaled, posterior margin deeply concaved medially; tergum VIII scaleless, sparse setae towards triangular lateral extensions; papillae anales small, narrowed, verticled, densely setose, without papillose bases; lamella antevaginalis forming narrowed sclerotized ring, smooth rim, fused with lamella postvaginalis laterally, lamella

postvaginalis forming sclerotized plate, extending posterolaterally, dense microtrichia; ductus bursae with large sclerotized plate posterior half, irregular, not encircled, with narrow band-like extending to end of corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two signa, spine-like, dilated basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'34"N 98°24'06"E, 12 Jan 2002 (1♀, genitalia slide NP112), 14°41'39"N 98°24'10"E, 13 Jan 2002 (2♂, genitalia slide NP164, NP165, 1♀, genitalia slide NP166).

Remarks. Specimens were collected during the winter season at 1,018 m in hill evergreen forest.

Parapammene sp. C

Figs. 29.2, 98.4

Description. *Head*: Lower frons yellowish white mixed with light brown, upper frons greyish yellow, labial palpus with first segment yellowish grey, second segment yellowish white to yellowish grey with brown to dark brown ventrally, brown spot medially, dorsoapically brown to dark brown, apical segment dark brown; vertex dark brown with each scale becoming paler basally and yellowish white apices.

Thorax: Pronotal collar dark brown with yellowish white apices; tegulae dark brown with yellowish white apices; mesonotum dark brown with yellowish white apices. Forewing (Fig. 29.2): Length 4.68 mm in female (n=1), termen slightly concave between wing apex and M_2, ground color light brown; costal strigulae yellowish white, strigulae 2-5 double paired and separated by dark brown, strigulae 6-9 paired and separated by dark brown; basal patch distinct extending from wing base to strigulae 5 and from costa to inner margin, curved medially, brown mixed with dark brown; median fascia extending obliquely frown costa enlarged to inner margin, brown mixed with dark brown, strigulae 5 with grey striae beyond median fascia

extending obliquely from costa to M_1 and extending straightly to inner margin near tornus; apical 1/5 with dark brown small spots from R_1 to between CuA_1 and CuA_2 surrounding with brownish orange and brown scales; outer margin with terminal strigulae between R_5 and M_1, yellowish white. Underside light brown to brown with yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 98.4): Sternum VII with large sclerotized plate, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII without scales or setae, triangular lateral extensions with moderately dense scales, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming moderately large, rounded lobe, dense microtrichia throughout; ostium bursae small; ductus bursae with sclerotized plate medially with narrowed band-like, curved, reaching to near end of ductus bursae; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two signa, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP421).

Remarks. Specimen was collected during the summer season at 360 m in dry evergreen forest.

Parapammene sp. D

Fig. 98.5

Description. Wing pattern poorly defined.

Female genitalia (Fig. 98.5): Sternum VII with large sclerotized plate, densely scaled, becoming more dense medially towards posterior margin, posterior margin concaved medially; tergum VIII without scales or setae, triangular lateral extensions with dense scales; papillae anales densely setose, lateral setae with papillose bases;

sterigma forming sclerotized plate, surrounding ostium bursae; lamella antevaginalis forming narrowed sclerotized band, smooth, fused with lamella postvaginalis laterally, which forming moderately large sclerotized plate, dense microtrichia, with group of dense scales posterolaterally; ostium bursae membranous; ductus bursae rather short, with sclerotized plate, irregular, posterior with narrowed band reaching to corpus bursae; ductus seminalis arising from near middle of ductus bursae; corpus bursae with two spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 20 Apr 2002 (1♀, genitalia slide NP345).

Remarks. Specimen was collected during the summer season at 195 m in mixed deciduous forest.

Parapammene sp. E

Figs. 29.3, 77.3, 77.4

Description. *Head*: Lower frons orange white, upper frons brownish orange to light brown; labial palpus with first segment orange white, second segment orange white to pale orange mixed with dark brown dorsobasally, dorsomedially and apically, apical segment brown mixed with dark brown; vertex light brown.

Thorax: Pronotal collar light brown to brown; tegulae brown mixed with light brown, each scales with orange white apices; mesonotum brown with each scale orange white apices. Forewing (Fig. 29.3): Length 4.45 mm in male (n=1); male costal fold absent, termen round; ground color light brown; costal strigulae white to orange white, strigulae 1-2 indistinct, strigulae 3-9 paired and separated by dark brown; basal fascia indistinct; subbasal fascia extending from costa to inner margin, curved outward medially, brown to dark brown; median fascia extending obliquely from costa to inner margin near tornus, brown mixed with dark brown; postmedian fascia extending diagonally from costa to R_5; ocellus region with 5 dark brown dashes between R_5 and CuA_2, strigulae 9 with orange white striae extending from costa to

tornus; outer margin with distinct dark brown line, broken by indistinct orange white strigulae between M_1 and M_2. Underside light brown with white spots on costa between veins. Hindwing brown dorsally, with long dark brown scales on anal margin near wing base, ventrally light brown.

Abdomen (Fig. 77.4): Sternum VIII subrectangular. Coremata with a pair of scale-tufts laterally, long lanceolate-shaped.

Male genitalia (Fig. 77.3): Tegumen with arms, broaded, apex rounded, scaleless; uncus and socii absent; gnathos arising from near basal 1/3 of tegumen, band-like, weakly sclerotized; caulis moderately long; anellus closely surrounding basal 1/3 of aedeagus; aedeagus rather short, widened, apical 1/3 narrowed, cornuti eight, located at base of aedeagus; juxta triangular; sacculus with group of dense, moderately long setae basally, median with moderately dense, long setae on ventral margin towards neck, and moderately dense, long mixed with short setae between basal opening and neck, dorsal sparsely setose towards cucullus; neck moderately long, widened, sparsely setose on margins; cucullus large, oval-shaped, with dense, short and long spiniform setae apically, outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♂, genitalia slide NP619).

Remarks. Specimen was collected during the winter season at 742 m in hill evergreen forest.

Procoronis Meyrick, 1911

Procoronis Meyrick, 1911, Proc. Linnean Soc. N. S. Wales 36: 250. Type species: *Procoronis rothias* Meyrick, 1911

Procoronis includes only one species worldwide and has been described from Burma (Brown, 2005).

Procoronis swinhoeiana (Walsingham), 1890
Figs. 29.4, 98.6

Grapholitha swinhoeiana Walsingham, 1890, Trans. Ent. Soc. Lond. 1890: 294. Type locality: Burma [Myanmar] (Rangoon). Holotype (♀): BMNH.

Procoronis rhothias Meyrick, 1911, Proc. Linn. Soc. N. S. W. 36: 251. Type locality: Indonesia (Moluccas, Mangola). Lectotype (♂): BMNH.

Procoronis swinhoeana Diakonoff, 1949, Bijdr. Dierk. 28: 1381. [misspelling of *swinhoeiana*].

Description. *Head*: Lower frons white to yellowish white, upper frons greyish orange; labial palpus with first segment yellowish white, second segment yellowish white with strip, brownish orange extending from dorsally tapering to ventroapically, apical segment greyish orange with white apex, vertex yellowish white to orange white.

Thorax: Pronotal collar yellowish white mixed with light brown and brown; tegulae yellowish white mixed with light brown; mesonotum yellowish white. Forewing (Fig. 29.4): Length 15.04 mm in female (n=1); termen strongly concave between wing apex and M_2; ground color yellowish white to pale yellow; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal and subbasal fascia absent; median fascia incompleted present as brownish grey strip extending obliquely from costa to R_4; postmedian fascia present as short strip brownish grey extending from costa to R_4; costal margin with white to yellowish white patch extending from wing base to R_4 and from costa to discal cell, discal cell curved, with patch light brown to dark brown mixed with brownish grey; ocellus region with longitudinal strips between veins from R_5 to CuA_2, brownish yellow to brownish orange except between R_5 and M_1, brown to dark brown; outer margin with terminal strigulae between R_5 and M_1, M_1 and M_2, M_2 and M_3, yellowish white.

Underside brown with yellowish white to yellowish grey spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 98.6): Sternum VII lightly and evenly sclerotized; tergum VIII with scales and setae on posterior face border; papillae anales with relatively wide, ventrally moderately setose, lateral setae arising from papillose bases; sterigma reduced to short, lightly sclerotized lamella postvaginalis covered with microtrichia, setae absent, lamella antevaginalis forming narrow rim extending posteriorly to enclose lamella postvaginalis; antrum forming sclerotized ring, colliculum encircling ductus posteriorly divided into two, ribbon-like plates, one spiraling, extended anteriorly; ductus seminalis arising between bases of ribbon-like plates, area between ribbon-like plates increasing sclerotized, anterior end of ductus bursae invaginated into corpus bursae to form heavily sclerotized, spinulate pocket connected with invaginated caecum on dorsoposterior side of corpus bursae; two blade-like signa, one signum short with wide base, the other signum twice length and lacking broad base.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'15"E, 5 Feb 2002 (1♀, genitalia slide NP209).

Distribution. Thailand (new record), Myanmar and Moluccan Is.

Remarks. Specimen was collected during the winter season at 1,020 m in montane evergreen forest.

Strophedra Herrich-Schäffer, 1853

Strophedra Herrich-Schäffer, 1853, Syst. Bearbeitung. Schmett. Eur. 6: pl. 11, fig. 31. [replacement name for *Strophosoma*].

Strophosoma Herrich-Schäffer, 1953, Syst. Bearbeitung. Schmett. Eur. 5: 29. Type species: *Strophedra vigeliana* Herrich-Schäffer, 1853. [=*Pyralis nitidana* Fabricius, 1794]. [preoccupied].

Strophedromorpha Diakonoff, 1976, Zool. Verh. Leiden 144: 29. Type species: *Strophedromorpha mica* Diakonoff, 1976.

Strophedra has been defined by the following characters; very small to small moths with subovate (rarely subtriangular), forewing with ground color greyish fuscous to dark fucuous, with 4 costal strigulae beyond middle of costa, with ocelloid patch with outer edge absent or reduced, and without whitish striae below apex. Labial palpus very short, ascending, second segment slightly roughly scaled beneath. Female hindwing with frenulum of 2 bristles. Male hindwing usually without trace of Rs or rarely with Sc+R_1 and Rs fused before outer edge of discal cell, with M_3 and CuA_1 short stalked. Tergum 8 of male hood-shaped, with a pair of tufts of long hair-like scales arising from shallow membranous pockets on each side. Coremata sometimes lacking scale-tufts. In male genitalia, tegumen usually with pointed top, valva with ovate or semicircular cucullus, aedeagus usually straight, abruptly narrowed at distal 1/5-1/4. The female genitalia characterized by the seventh sternite with posterior edge produced into a median process (Kuznetsov, 1987; Komai, 1999). The genus includes10 species worldwide. *Strophedra* includes 3 species have been described from the Oriental region (Brown, 2005).

Unplaced *Strophedra*

Strophedra sp. A

Figs. 29.5, 77.5, 99.1

Description. *Head*: Lower frons yellowish white, upper frons greyish orange; labial palpus with first segment yellowish white, second segment yellowish white, apical segment yellowish white; vertex brown to dark brown with greyish orange apices.

Thorax: Pronotal collor dark brown with orange white apices; tegulae dark brown with orange white apices; mesonotum dark brown with orange white apices. Forewing (Fig. 29.5): Length 4.68 mm in male (n=1), 4.5 mm in female (n=3); male costal fold absent; termen rather straight; ground color brown, costal strigulae yellowish white, strigulae 1-4 paired and separated by dark brown, strigulae 5-7 two paired and separated by dark brown, strigulae 8 and 9 absent; basal and subbasal fascia suffused with ground color; median fascia indistinct present as grey narrow strip extending obliquely from costa to R_5, curved and extending to inner margin near tornus, with two transverse rows of dark brown spots extending from R_4 to inner margin; inner margin with large subtriangular patch close to medially, white to yellowish white extending from inner margin to R vien, mid of base with narrow dark brown line extending from inner margin to 1A+2A, outer margin without terminal strigulae. Underside light brown with dark brown between costa to discal cell. Hindwing brown dorsally, light brown vertrally.

Male genitalia (Fig. 77.5): Tegumen subtriangular with arms moderately broad, narrowed to apex, scaleless, uncus and socii absent; gnathos arising from middle of tegumen, narrowed band-like, sclerotized basally; anellus closely surrounding basal 1/4 of aedeagus; aedeagus moderately long, abruptly narrowed at apical 1/3; cornuti with two groups located apically, five short-stout cornuti and eight deciduous cornuti; juxta triangular; sacculus with group of dense, short setae basally, ventromedial area with short, sparsely setose, between basal opening and neck with sparsely long setose; valva slightly concaved medially forming neck, without setae; cucullus short, rounded at apex, sparsely setose, with long, dense spiniform setae and short stout spines near ventral margin, area close to ventral margin with row of sparse setae, posterior surface with group of dense scale sockets.

Female genitalia (Fig. 99.1): Sternum VII with moderately large sclerotized plate, densely scaled medially and near posterior margin, posterior margin concaved, with distinct small subtriangular lobe medially, pointed dorsally, anterior margin irregular; tergum VIII without scales or setae, triangular lateral extensions densely setose; papillae anales densely setose, lateral setae with papillose bases; lamella

antevaginalis reduced, lamella postvaginalis forming very narrow ridge laterally, sclerotized; ostium bursae covered by sternum VII, antrum forming a narrow, small cup; ductus bursae short, with irregular sclerotized plate medially; ductus seminalis arising from anterior end of corpus bursae, which large, consisting of two small, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♂, genitalia slide NP407, 3♀, genitalia slide NP406).

Remarks. Specimens were collected during the summer season at 742 m in hill evergreen forest

Strophedra sp. B

Figs. 29.6, 77.6

Description. *Head*: Lower frons yellowish white, upper frons orange white; labial palpus with first segment white, second segment white to yellowish white, apical segment white; vertex brown mixed with dark brown.

Thorax: Pronotal collar brown; tegulae brown to dark brown; mesonotum brown to dark brown. Forewing (Fig. 29.6): Length 3.36 mm in male (n=1); male costal fold absent; termen rather straight; ground color brown intermixed with light brown, costal strigulae yellowish white, strigulae 1-7 paired and separated by dark brown, strigulae 8 and 9 absent; basal and subbasal fascia suffused with ground color; median fascia extending obliquely from costa to R vein, dark brown; wing apex with dark brown strip extending along margin form strigulae 7 to M_3; ocellus region with transverse brown strip extending from R_4 to tornus with two rows of dark brown dashes surrounding with brownish orange scales; outer margin without terminal strigulae. Underside light brown with dark brown spots between Sc and R vein. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 77.6): Tegumen subtriangular, narrowed, without scales or setae, uncus and socii absent; gnathos arising from middle of tegumen, narrowed, band-like, sclerotized basally; anellus closely surrounding basal 1/3 of aedeagus; aedeagus long, sinuated, dilated near basally, apical 1/3 abruptly narrowed; cornuti absent; sacculus with group of short setae basally, area betweeen basal opening and neck with sparse, long setae, ventromedial margin with group of moderately dense, short setae; valva concaved medially forming neck; cucullus short, subovate, rounded at apex, dense long spiniform setae, with short, stout setae along near outer margin, posterior surface with group of dense scales sockets.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'40"N 98°24'37"E, 12 Jun 2002 (1♂, genitalia slide NP455).

Remarks. Specimen was collected during the summer season at 920 m in hill evergreen forest.

Thaumatotibia Zacher, 1915

Thaumatotibia Zacher, 1915, Tropenpflanzer 18: 529. Type species: *Thaumatotibia roerigii* Zacher, 1915. [=*Argyroploce leucotetra* Meyrick, 1913].

Metriophlebia Diakonoff, 1969, Tijdschr. Ent. 112: 89. Type species: *Eucosma chaomorpha* Meyrick, 1929.

Thaumatotibia has been defined by the following characters; medium-sized, greyish brown to blackish brown moths with broad forewings with a blackish triangular pretornal mark, hindwing with a short cell, especially in the male. The genus has long, sinuate labial palpi and a thoracic crest of often long, loose scales. Tergum 8 in the male is characteristic, a broadly sclerotized plate with a medially convex posterior margin laterally produced into curved points, with a paired patch of long mane-likes but without paired lateral scale tufts in shallow pocket. Coremata with or without deeply invaginated scale tufts, but intersegmental ventral sclerite

never with levers. The male genitalia are characterized by a large, ovate valva with very long, curled scales on the outer surface, and with the sacculus often ending in distal ridge or teeth. The female genitalia are characterized by a sterigma formed by an ovate or rectangular raised rim, posteriorly connected with a pair of ovate depression with modified scales, by a ring of spinules at the juncture of ductus and corpus bursae, and by large, horn-shaped signa (Komai, 1999). The genus includes 17 species worldwide. *Thaumatotibia* includes 3 species have been described from the Oriental region (Brown, 2005).

Thaumatotibia hemitoma (Diakonoff), 1976
Figs. 29.7, 78.1, 78.2, 99.2

Cryptophlebia hemitoma Diakonoff, 1976, Zool. Verh. Leiden 144: 45. Type locality: Nepal (Kathmandu Valley, Godavari). Holotype (♂): ZSM.

Description. *Head*: Lower frons dark brown, upper frons brownish red mixed with dark brown; labial palpus with first segment brown mixed with dark brown, second segment light brown mixed with brown to dark brown, apical segment light brown to brown; vertex brownish red intermixed with dark brown.

Thorax: Pronotal collar dark brown; tegulae dark brown mixed with brown basally, apically brown, some scales with white apices; mesonotum dark brown mixed with brownish red, posterior scales tuft brownish red mixed with orange white. Forewing (Fig. 29.7): Length 6.71 mm in male (n=3), 6.81 mm in female (n=5); male costal fold absent, termen round; ground color brown to dark brown, costal strigulae orange white, striguale 1-9 paired and separated by dark brown, strigulae 1-2 indistinct, with large patch extending from costa between wing base and strigulae 5 to near middle of ventral margin, ventral margin with patch, pale orange mixed with orange red to brownish red and dark brown, pretornal spot with triangular patch, orange white to pale orange mixed with orange red to brownish red and dark brown spot; postmedian fascia extending diagonally from costa between strigulae 6 and 7 to outer margin near tornus, area between basal patch and postmedian fascia with wide,

brown strip extending from tornus to R_5, surrounding with orange white to pale orange and orange red, area between postmedian fascia and outer margin with striae, light brown to brown; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1. Underside light brown with greyish yellow spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Abdomen (Fig. 78.2): Sternum VIII subtriangular. Coremata with a pair of scale-tufts, filiform-shaped.

Male genitalia (Fig. 78.1): Tegumen moderately broad, with group of moderately dense scales apicolaterally, apically rounded, uncus and socii absent; gnathos arising from dorsal 1/3 of tegumen, sclerotized U-shaped band, larged, widened, dense denticles ventrolaterally; anellus closely surrounding 1/3 of aedeagus; aedeagus long, narrowed, widened basal 1/4, outer margin apical 3/4 with sparse denticles; cornuti absent; juxta with a pair of lobe, apex rounded, denticulate; sacculus smaller than cucullus, with group of moderately dense setae basally, and sparse setae along ventrobasal margin, median slightly concave, with short setae along basal opening, with small lobe close to basal opening, posterior surface denticulate; neck indistinct; cucullus large, ovate, with dense spines.

Female genitalia (Fig. 99.2): Sternum VII trapezoidal-shaped, posterior margin deeply concave medially, densely scaled; tergum VIII with moderately dense scales and sparse setae posteriorly, extended to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose base; sterigma forming narrowed ring, raised up, sclerotized, connecting posteriorly with a pair of dense microtrichia plate, granulated, extending posterolaterally; ostium bursae small, membranous margin; colliculum short, sclerotized; ductus bursae moderately long; ductus seminalis arising from posterior 1/4 of ductus bursae; corpus bursae with sclerotized plate, granulated, on junction between corpus and ductus bursae, with diverticulum anterolaterally, with two large, curved, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°33'12"N 98°34'33"E, 17 Mar 2002 (1♀, genitalia slide NP271), 14°41'39"N 98°24'10"E, 19 Apr 2002 (1♂, genitalia slide NP333), 14°39'02"N 98°31'40"E, 9 May 2002 (1♀, genitalia slide NP431), 14°41'27"N 98°27'29"E, 14 May 2002 (2♂, genitalia slide NP367, NP482, 1♀), 10 Jun 2002 (1♀, genitalia slide NP473), 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP409).

Distribution. Thailand, Nepal, Vietnam and Japan.

Remarks. Specimens were collected during the summer season at 195-1,020 m in mixed deciduous forest, dry evergreen forest and hill evergreen forest.

Unplaced *Thaumatotibia*

Thaumatotibia sp. A

Figs. 29.8, 99.3

Description. *Head*: Lower frons and upper frons brownish orange mixed with light brown; labial palpus with first, second and apical segment brown to dark brown; vertex brownish orange to brownish red.

Thorax: Pronotal collar dark brown; tegulae brown mixed with dark brown; mesonotum brown mixed with greyish orange medially, posterior scales tuft greyish orange. Forewing (Fig. 29.8): Length 5.74 mm in female (n=4); termen rounded; ground color indistinct; costal strigulae orange white, strigulae 1-2 indistinct, strigulae 3-9 paired and separated by dark brown, basal half of wing length with large irregularly patch, brown mixed with dark brown extending from wing base to strigulae 5 and from costa to inner margin, except on inner margin with small patch, orange grey mixed with brownish orange; postmedian fascia extending irregular obliquely from costa and slightly narrowed to tornus, dark brown mixed with brownish orange; preterminal fascia present as brownish orange narrow line extending from costa to outer margin at R_5, strigulae 6 with irregular striae, orange white to pale orange

extending on distal margin of basal patch and proximal margin of postmedian fascia; pretornal subtriangular spot, extending between inner margin and CuA_2, brownish orange mixed with dark brown spots; ocellus region with transverse grey patch between tornus and R_5, near outer margin with grey narrow strip between R_5 and CuA_2. Underside light brown to brown with yellowish grey spots on costa between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 99.3): Sternum VII with large sclerotized plate, densely scaled; tergum VIII and triangular lateral extensions densely setose; papillae anales densely setose, lateral setae with papillose bases; sterigma developed forming suboval-shaped, sclerotized, smooth, raised up, with ostium bursae opening dorsoapically, lateral with sclerotized ridge on sternum VIII posterior margin, lamella antevaginalis reduced, lamella postvaginalis forming large patch extending posterolaterally, densely microtrichiate and setose connected with sterigma posteriorly, colliculum small, sclerotized; ductus seminalis arising from anterior 1/3 of ductus bursae; ductus bursae with small, sclerotized plate at anterior end of corpus bursae; corpus bursae large with two long signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 10 May 2002 (1♀, genitalia slide NP419), 20 Nov 2003 (1♀, genitalia slide NP567), 14°41'27"N 98°27'29"E, 10 Jun 2002 (1♀, genitalia slide NP548), 14°40'03"N 98°36'07"E, 19 Dec 2003 (1♀, genitalia slide NP.566).

Remarks. Specimens were collected during the summer season and the winter season at 180-255 m in mixed deciduous forest and dry evergreen forest.

Thaumatotibia sp. B

Figs. 30.1, 99.4

Description. *Head*: Lower frons greyish orange, upper frons brownish orange mixed with dark brown; labial palpus with first segment brown to dark brown mixed with orange white dorsally, second segment brown to dark brown with orange white

spots dorsomedially, apical segment brown to dark brown; vertex greyish to brownish orange intermixed with dark brown.

Thorax: Pronotal collar dark brown mixed with light brown, tegulae brown intermixed with light brown and dark brown; mesonotum brown to dark brown with posterior scales tuft brownish grey. Forewing (Fig. 30.1): Length 8.76 mm in female (n=2); termen straight, ground color white to orange white, costal strigulae orange white, strigulae 1-9 paired and separated by dark brown, basal fascia indistinct extending irregularly from wing base to strigulae 1 and from costa to inner margin, brown mixed with dark brown; subbasal fascia indistinct; median fascia extending from costa enlarged to inner margin, brown mixed with dark brown, subtriangular pretornal spot, brown mixed with dark brown; postmedian and preterminal fascia present as dark brown spots on costa between costa and R_4; ocellus region with irregular transverse lines and strips, brown to dark brown, extending from R_4 to tornus; outer margin with distinct dark brown line, broken by white strigulae between R_5 and M_1, M_1 and M_2. Underside light brown with yellowish grey spots on costa. Hindwing brown dorsally, ventral light brown.

Female genitalia (Fig. 99.4): Sternum VII with posterior margin deeply concave medially, densely scaled, with dense microtrichia on lateral area; tergum VIII with moderately dense scales and sparse setae posteriorly, extended to triangular lateral extensions; papillae anales densely setose, lateral setae with papillose bases; sterigma forming narrowed ring, oval-shaped, sclerotized, connecting posteriorly with slightly sclerotized band, connected with lamella postvaginalis, forming a pair of oval plate, extending posterolaterally, dense scales and microtrichia, sparsely setose; ostium bursae small, membranous margin; colliculum short, encircled, sclerotized; ductus bursae moderately long; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with narrowed ring, granulated on corpus bursae opening, with small diverticulum anterolaterally, with two large, curved, blade-like signa.

Thaumatotibia sp. D

Fig. 78.4

Description. Wing pattern poorly defined.

Male genitalia (Fig. 78.4): Tegumen with arms, moderately broad, moderately dense scales lateromedially, apicolaterally with lobe, subtriangular, with apex pointed and curved, sclerotized, scaleless; uncus and socii absent; gnathos arising from near midlength of tegumen, band-like, narrowed; caulis moderately long; anellus closely surrounding basal 1/6 of aedeagus length; aedeagus long, slender, basal 1/6 widened, abruptly narrowed apical 5/6, straight; cornuti five, short; juxta with a pair of ovate lobe, denticulate; sacculus with group of dense, moderately long setae basally, with rather small subtriangular lobe ventromedially, median with group of sparse, short spiniform setae, dorsal sparsely setose; neck indistinct; cucullus oblong, paralleled margins, rounded at apex, dense spines apically, sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♂, genitalia slide NP745).

Remarks. Specimen was collected during the winter season at 965 m in hill evergreen forest.

Unplaced Grapholitini

Genus A sp. A

Fig. 78.5

Description. Wing pattern poorly defined.

Male genitalia (Fig. 78.5): Tegumen subtriangular with arms, narrowed, apex rounded, densely scales laterally towards apex; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, band-like, membranous; anellus surrounding basal of

aedeagus; aedeagus rather short, slightly narrowed to apex; cornuti dense, long, 3/4 the length of aedeagus; sacculus with small group of moderately dense setae basally, ventromedial margin with sparse setae, area between basal opening and neck with large group of short, dense spines, dorsal sparsely setose towards cucullus; neck slightly concaved, sparse setae; cucullus rotated, suboval-shaped, densely setose, with dense spines near outer margin, dorsal margin with two distinct lone spines.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°33'51"N 98°37'58"E, 23 Apr 2002 (1♂, genitalia slide NP360).

Remarks. Specimen was collected during the summer season at 260 m in mixed deciduous forest.

Genus B sp. A

Figs. 30.2, 79.1

Description. *Head*: Lower frons yellowish white to yellowish grey, upper frons light brown, labial palpus with first segment yellowish grey, second segment yellowish grey intermixed with light brown, apical segment yellowish grey; vertex dark brown with yellowish white apices.

Thorax: Tegulae dark brown with yellowish white apices; mesonotum dark brown with yellowish white apices. Forewing (Fig. 30.2): Length 3.91 mm in male (n=9); male costal fold absent, termen slightly concaved between wing apex and M_2; ground color light brown to brown intermixed with diffuse, white small scales; costal strigulae white to yellowish white, strigulae 1 and 2 indistinct, strigulae 3-9 singled, basal fascia indistinct suffused with ground color, basal fascia distinct extending obliquely from costa to discal cell, angled and extending obliquely to inner margin dark brown, median fascia extending obliquely from costa to R_2 and extending straight to inner margin near tornus; postmedian fascia extending obliquely from costa to outer margin between R_5 and M_1, dark brown , strigulae 3 with grey striae extending, obliquely from costa to midwing at discal cell, strigulae 5 with grey striae

extending obliquely from costa to ternus, inner margin medially with indistinct patch present as indistinct four transverse lines extending from inner margin to midwing, yellowish white; outer margin with distinct brown line broken by white strigulae between R_5 and M_1. Underside light brown to brown with yellowish white spots on costa and outer margin between veins. Hindwing brown to dark brown dorsally, light brown to brown vertrally.

Male genitalia (Fig. 79.1): Tegumen with arms, rather narrowed, scaleless; uncus and socii absent; gnathos arising from apical 1/3 of tegumen, sclerotized basally; anellus closely surrounding basal 1/4 of aedeagus; aedeagus long and slender, sinuated; cornuti dense, located near middle of aedeagus; valva distinct shape, large tubular-like, rounded at apex, curved upward medially; neck indistinct; sacculus with group of dense setae basally towards ventromedially; cucullus with long, dense spines and rather short, dense spines apically; outer margin sparsely setose.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (1♂, genitalia slide NP263), 14°41'32"N 98°24'17"E, 19 Jan 2004 (1♂ genitalia slide NP704), 14°41'43"N 98°27'34"E, 19 Feb 2004 (5♂, genitalia slide NP700, NP701), 20 Feb 2004 (2♂, genitalia slide NP690).

Remarks. Specimens were collected during the winter season and the summer season at 220-965 m in mixed deciduous forest and hill evergreen forest.

Genus C sp. A

Figs. 30.3, 99.5

Description. *Head*: Lower frons yellowish white, upper frons orange grey to brownish orange, labial palpus with first segment orange grey, second segment greyish orange with brown to dark brown spots basally, ventromedially and apically, apical segment brown with yellowish white spot at apex; vertex light brown to brown, some scales with yellowish white apices.

Thorax: Pronotal collar brown; tegulae light brown to brown mixed with dark brown basally; mesonotum brown alternating with transverse yellowish white line and one dark brown strip medially, anteromedially with yellowish white spot. Forewing (Fig. 30.3): Length 7.22 mm in female (n=1); termen slightly concave between wing apex and CuA_1; ground color light brown; costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown; basal fascia indistinct; subbasal fascia present as indistinct dark brown narrow line extending from costa to inner margin; median and postmedian fascia present as dark brown spots on costa; preterminal fascia extending obliquely from costa to outer margin at R_5, strigulae 5, 6 and 7 with grey striae, fused, extending obliquely from costa to outer margin at R_5; inner margin with wide strip, brown with dark brown on margins extending obliquely from near middle of inner margin to R_1, angled and extending obliquely as indistinct strip to tornus; wing apex dark brown; outer margin with brown to dark brown broken by yellowish white strigulae between R_5 and M_1 with yellowish white spots from between CuA_1 and CuP to tornus. Underside light brown to brown with yellowish spots on costa and outer margin between veins. Hindwing brown dorsally, light brown ventrally.

Female genitalia (Fig. 99.5): Sternum VII with large sclerotized plate, densely scaled and sparsely setose; tergum VIII moderately dense scales posteriorly, except posteromedially, triangular lateral extensions densely scaled, sparsely setose; papillae anales densely setose, lateral setae with papillose bases; ostium bursae widened, rounded, present on sternum VII near anterior margin; lamella antevaginalis forming sclerotized ring, moderately widened, smooth rim, lamella postvaginalis fused with lamella antevaginalis laterally, lamella postvaginalis forming two large patch, subtriangular, fused with sternum VII, dense microtrichia, densely scaled and sparsely setose, colliculum small, weakly sclerotized; ductus bursae short, with sclerotized plate anterior half; ductus seminalis arising from end of sclerotized plate; corpus bursae with two large signa, curved, blade-like, rounded at apex.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP411).

Remarks. Specimen was collected during the summer season at 742 m in hill evergreen forest.

Genus D sp. A

Figs. 30.4, 99.6

Description. *Head*: Lower frons yellowish white, upper frons light brown; labial palpus with first segment yellowish white mixed with light brown, second segment light brown becoming darker to dark brown apically, apical segment yellowish white mixed with dark brown; vertex brown mixed with dark brown.

Thorax: Pronotal collar dark brown; tegulae brown mixed with dark brown; mesonotum brown mixed with dark brown, posterior scales tuft dark brown with each scales orange grey apices. Forewing (Fig. 30.4): Length 5.45 mm in female (n=1); termen rounded; ground color yellowish white; costal strigulae white, strigulae 1-2 indistinct, strigulae 3-8 paired and separated by dark brown, strigulae 9-10 singled; basal patch dark brown extending irregularly from wing base to strigulae 3 and from costa to inner margin; median fascia distinct extending irregular obliquely from costa to inner margin, dark brown with silvery brown curved strip on distal margin between R_5 and CuA_1; postmedian fascia brown mixed with dark brown extending from costa and enlarged to outer margin between R_5 and M_3; preterminal fascia present as dark brown spot on costa; pretornal subtriangular patch dark brown extending from inner margin pointed to M_2, between pretornal patch and outer margin with silvery brown spots between M_1 and tornus. Underside light brown with yellowish white spots on costa between veins. Hindwing brown with hyaline area on discal cell dorsally, light brown ventrally.

Female genitalia (Fig. 99.6): Sternum VII moderately large, sclerotized plate, posterior margin concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII without scales or setae, triangular lateral extensions densely scaled, sparsely setose; lamella antevaginalis and lamella postvaginalis reduced; papillae anales densely setose, lateral setae with papillose bases; ostium

bursae with dense microtrichia, anterior margin concaved medially, posterior margin fused with abdominal membrane, antrum forming sclerotized, funnel-shaped, dense microtrichia on inner surface, colliculum long and slender, ductus bursae long and narrowed, sclerotized, wrinkled; ductus seminalis arising from posterior end of colliculum; corpus bursae without signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'02"N 98°31'40"E, 17 Aug 2002 (1♀, genitalia slide NP387).

Remarks. Specimen was collected during the rainy season at 195 m in mixed deciduous forest.

Genus E sp. A

Fig. 100.1

Description. Wing pattern poorly defined.

Female genitalia (Fig. 100.1): Sternum VII with moderately large sclerotized plate, posterior margin deeply concaved medially, densely scaled, sparsely setose laterally; tergum VIII and triangular lateral extensions with sparsely setose throughout, papillae anales narrowed, densely setose, lateral setae without papillose bases; lamella antevaginalis reduced, lamella postvaginalis present as small patch of dense scales; ostium bursae covered by sternum VII, anterior margin sclerotized, smooth; ductus bursae sclerotized anterior half, constricted near ostium bursae, enlarged as pouch anteriorly; ductus seminalis arising from pouch laterally; corpus bursae with small diverticulum anteriorly, two unequal signa, blade-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 15 May 2002 (1♀, genitalia slide NP546).

Remarks. Specimen was collected during the summer season at 742 m in hill evergreen forest.

Genus F sp. A

Fig. 100.2

Description. Wing pattern poorly defined.

Female genitalia (Fig. 100.2): Sternum VII with weakly sclerotized plate, moderately large, posterior margin deeply concaved medially, densely scaled, becoming more dense towards posterior margin, sparsely setose; tergum VIII without scales or setae, triangular lateral extensions moderately dense scales; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis and lamella postvaginalis reduced; ostium bursae present near anteromedial margin, small, smooth rim, covered by sternum VII, antrum forming small cup-shaped, colliculum small, sclerotized; ductus bursae with sclerotized plate, irregular, over posterior half, posterior end extended to corpus bursae; ductus seminalis arising from posterior end of ductus bursae; corpus bursae with two small signa, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP512).

Remarks. Specimen was collected during the rainy season at 220 m in mixed deciduous forest.

Genus G sp. A

Fig. 100.3

Description. Wing pattern poorly defined.

Female genitalia (Fig. 100.3): Sternum VII with moderately large sclerotized plate, posterior margin concaved medially, densely scaled throughout; tergum VIII sparsely scaled and setose, except posteromedially, triangular lateral extensions with moderately dense scales and sparse setae; papillae anales densely setose, lateral setae with papillose bases; lamella postvaginalis reduced, lamella antevaginalis forming

small plate, sclerotized, robust; ostium bursae with anterior margin concaved medially, smooth rim, antrum forming small, sclerotized cup, colliculum small, sclerotized, ductus bursae with posterior 2/3 sclerotized, rotated posteriorly; ductus seminalis arising from posterior 1/3 of ductus bursae; corpus bursae with two large signa, blade-like, with small diverticulum anteriorly.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°35'51"N 98°37'58"E, 23 Apr 2002 (1♀, genitalia slide NP357).

Remarks. Specimen was collected during the summer season at 260 m in mixed deciduous forest.

Genus H sp.A

Figs. 30.5, 79.2, 100.4

Description. *Head*: Lower frons yellowish white to yellowish grey, upper frons brown mixed with dark brown with orange grey apices; labial palpus with first segment yellowish white, second segment greyish yellow mixed with light brown dorsomedially, apical segment light brown; vertex dark brown with yellowish white apices.

Thorax: Pronotal collar dark brown with yellowish white apices; tegulae brown mixed with dark brown with yellowish white apices; mesonotum dark brown with yellowish white apices. Forewing (Fig. 30.5): Length 4.77 mm in male (n=5), 5.22 mm in female (n=3); male costal fold absent; termen slightly concave between wing apex and M_3; ground color yellowish white to orange white, costal strigulae yellowish white, strigulae 1-9 paired and separated by dark brown except strigulae 6 and 8 singled; basal patch distinct extending from wing base to strigulae 3 and from costa to inner margin, dark brown mixed with diffuse yellowish scales, distal margin extending obliquely from costa to midwing, angled and extending obliquely to inner margin; strigulae 3 and 4 with grey striae extending obliquely from costa to R vein; median fascia distinct on costa extending obliquely from costa to R_5, dark brown,

bordered with brown scales and extending irregularly enlarged to inner margin near tornus, brown to dark brown, strigulae 5 with grey striae extending obliquely from costa to tornus; postmedian fascia distinct extending obliquely from costa to outer margin at between M_1 and M_2, strigulae 7 with grey striae extending obliquely from costa to outer margin at R_5, wing apex orange white on outer margin between wing apex and strigulae 5; ocellus region with distinct three dark brown spots between M_2 and CuA_2, with transverse line beyond spots, brownish grey between M_1 and CuA_2, middle of inner margin with irregular transverse line, dark brown extending obliquely from inner margin to midwing; outer margin with distinct dark brown line. Underside light brown with yellowish grey spots on costa between veins. Hindwing brown dorsally, light brown ventrally.

Male genitalia (Fig. 79.2): Tegumen subrectangular, with arms, moderately broad, widened apicolaterally, scaleless; uncus absent; socii ill-defined shape, present as group of dense long setae apicolateral 1/3 of tegumen; gnathos arising from near midlength of tegumen; vinculum large, V-shaped; caulis moderately long; anellus closely surrounding basal of aedeagus, extended dorsally; aedeagus long, slender, slightly narrowed to apex, curved medially, with four spine-like cornuti, apex with distinct short, single spine; valva deeply incised ventromedially forming neck, short; sacculus with group of short, dense setae basally reaching ventrobasal margin, ventromedial margin forming subtriangular lobe, with apex dense denticulate, median with small group of long and short, sparse setae near basal opening margin, and group of moderately dense, short setae between basal opening and neck; cucullus subovate, large, sparsely setose, with dense spines and spiniform setae ventral half.

Female genitalia (Fig. 100.4): Sternum VII with moderately large, sclerotized plate, posterior margin deeply incised medially, densely scaled, except anteriorly; tergum VIII and triangular lateral extensions sparsely setose; papillae anales with posterior edge narrowed, lateral widened, erected, densely setose, without papillose bases; lamella postvaginalis forming small patch of dense scales, lamella antevaginalis distinct, forming moderately large lobe, with margin sclerotized, wrinkled posterolaterally, connected with antrum laterally; ostium bursae oval-shaped, anterior

margin concaved medially, smooth, posterior margin extended posteriorly, inner surface densely microtrichiate, antrum forming sclerotized cup, moderately large, long near half of tegumen length; ductus seminalis arising from near anterior end of corpus bursae; corpus bursae with diverticulum, rather small, and two spine-like signa, moderately long, dilated basally.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°38'28"N 98°35'02"E, 16 Mar 2002 (3♂, genitalia slide NP255, NP259, NP260, 2♀, genitalia slide NP262, NP265), 14°41'43"N 98°27'34"E, 19 Feb 2004 (2♂, genitalia slide NP689, NP703, 1♀).

Remarks. Specimens were collected during the winter season and the summer season at 220-745 m in mixed deciduous forest and hill evergreen forest.

Genus I sp. A.

Fig. 100.5

Description. Wing pattern poorly defined.

Female genitalia (Fig. 100.5): Sternum VII with moderately large, sclerotized plate, densely scaled, posterior margin concaved medially, sclerotized, anterior margin sclerotized medially; tergum VIII sparsely scaled, triangular lateral extensions with moderately dense scales; papillae anales densely setose, lateral setae with short papillose bases; sterigma developed, forming distinct sclerotized plate laterally beside ostium bursae, dense microtrichia, with small subtriangular lobe laterally; ostium bursae raised up, dense microtrichia laterally, opening at top, with rounded margin, smooth, colliculum small, weakly sclerotized; ductus bursae with sclerotized plate, long near half of ductus bursae length, narrowed posteriorly; ductus seminalis arising from near midlength of ductus bursae; corpus bursae with two, moderately long, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°39'10"N 98°36'29"E, 3 Oct 2002 (1♀, genitalia slide NP493).

Remarks. Specimen was colleced during the winter season at 752 m in hill evergreen forest.

Genus J sp. A

Fig. 100.6

Description. Wing pattern poorly defined.

Female genitalia (Fig. 100.6): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming moderately sclerotized, widened plate, densely microtrichiate, fused with ostium bursae laterally; ostium bursae with anterior margin sclerotized, smooth, antrum forming a wide, sclerotized cup, colliculum weakly sclerotized; ductus bursae rather short, with sclerotized, irregular plate extending posteriorly; ductus seminalis arising from near posterior end of sclerotized plate; corpus bursae with two curved signa, spine-like.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'43"N 98°27'34"E, 19 Feb 2004 (1♀, genitalia slide NP625).

Remarks. Specimen was collected during the winter season at 742 m in hill evergreen forest.

Genus K sp. A

Fig. 101.1

Description. Wing pattern poorly defined.

Female genitalia (Fig. 101.1): Sternum VII with moderately large, sclerotized plate, posterior margin concaved medially, densely scaled, becoming more dense towards posterior margin; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; ostium bursae rounded, margin sclerotized; lamella antevaginalis reduced, lamella postvaginalis fused with ostium bursae, forming moderately large, sclerotized plate, rounded posteriorly, with sparse transverse sclerotized ridge, densely microtrichiate, colliculum indistinct; ductus bursae with long, slender, sclerotized plate, not encircled posteriorly half; ductus seminalis arising from near anterior 1/3 of ductus bursae; corpus bursae with two curved, blade-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 21 Sep 2003 (1♀, genitalia slide NP668).

Remarks. Specimens were collected during the rainy season at 180 m in mixed deciduous forest.

Genus L sp. A

Fig. 101.2

Description. Wing pattern poorly defined.

Female genitalia (Fig. 101.2): Sternum VII with large, sclerotized plate, moderately dense scales laterally, posterior margin concaved medially, anteromedially forming sub-semicircular lobe, lateral margin folded, sclerotized, densely scaled; tergum VIII without scales or setae, triangular lateral extensions densely scaled; papillae anales densely setose, lateral setae with papillose bases; lamella antevaginalis reduced, lamella postvaginalis forming moderately large, subtriangular patch, densely microtrichiate and scaled; ostium bursae covered by sternum VII, antrum forming a small funnel-shaped, sclerotized; ductus bursae moderately long; ductus seminalis arising from posterior 1/5 of ductus bursae; corpus bursae with two small, curved, spine-like signa.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°41'03"N 98°36'07"E, 27 Aug 2003 (1♀, genitalia slide NP714).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

Genus M sp. A

Fig. 79.3

Description. Wing pattern poorly defined.

Male genitalia (Fig. 79.3): Tegumen with arms, narrowed, densely scaled laterally, apically rounded, widened, densely scaled; uncus and socii absent; gnathos arising from midlength of tegumen, completed band-like, widened; anellus closely surrounding basal of aedeagus; aedeagus moderately long, widened basal half, abruptly narrowed medially, apical half tubular-like, rather narrowed; cornuti absent; sacculus with group of dense setae basally reaching to ventral margin, ventromedially with moderately large, subtriangular lobe, dense short spines, with dense, short setae near basal opening margin, dorsal sparsely setose; neck indistinct; cucullus oblong, moderately large, rounded at apex, dense spiniform setae.

Specimens examined. Thailand: Kanchanaburi Prov.: Thong Pha Phum N.P., 14°40'03"N 98°36'07"E, 24 Aug 2003 (1♂, genitalia slide NP716).

Remarks. Specimen was collected during the rainy season at 180 m in mixed deciduous forest.

DISCUSSION

Until quite recently, the Olethreutinae fauna of Thailand has not been studied since the time of the Japanese Lepidopterological Expedition during 1981-1987. Although Diakonoff (1973) treated the fauna of South Asiatic Olethreutini, he reported only eight species from Thailand. Erawan National Park was the only place in Kanchanaburi province that was selected for the Japanese expedition during 1981-1987. Therefore, the survey and inventory of olethreutine fauna in Thong Pha Phum National Park is the first report of Olethreutinae from this park. The list of identified species in this study are important information for this National Park and Thailand.

The survey resulted in the collection of 109 identified species and 140 unidentified morphotypes. These included species in six tribes as follow: Gatesclarkeanini (1 identified species), Bactrini (8 identified species, 4 unidentified morphotypes), Olethreutini (42 identified species, 25 unidentified morphotypes), Enarmoniini (7 identified species, 14 unidentified morphotypes), Eucosmini (30 identified species, 45 unidentified morphotypes), and Grapholitini (21 identified species, 49 unidentified morphotypes). Based on comparisons of descriptions and illustrations, most of the known species in this study are in tribe Olethreutini, which is related to the major work on South Asiatic Olethreutini by Diakonoff (1973) and subsequent treatments of species in this tribe by Kawabe (1987, 1989, 1995), and Bae (1995). In other tribes, the identified species were mostly compared with fragmented information from several papers on species of Olethreutinae occurring outside Thailand, such as Clarke (1958, 1976) and Kuznetsov (1988, 1989, 1992, 1997 a, 1997 b, 2003). Endotheniini and Microcorsini were not found in this study, although one species of Endotheniini, *Endothenia bacillata*, and two species of Microcorsini, *Cryptaspasma hesyca* and *C. helota*, were reported from Thailand by Kawabe (1989) and Komai (1995), respectively.

The 109 identified species represent about 43 % of the morphotypes that were collected. Of the identified species, 54 are new records and additions to the fauna of Thailand. Of all the unidentified species, 87 morphotypes can be identified only to

genus, and 53 morphotypes cannot be assigned to any known of genus or species. This shows that the Olethreutinae fauna in Thailand is still poorly known.

CONCLUSION

The taxonomy of Olethreutinae (Lepidoptera:Tortricidae) was studied in different habitat types in Thong Pha Phum National Park during 2001-2004. Six tribes including 249 morphotypes were found, including species in Gatesclarkeanini, Bactrini, Olethreutini, Enarmoniini, Eucosmini, and Grapholitini. Of these morphotypes, 109 species in 62 genera can be identified, 87 morphotypes can be assigned to 35 genera but cannot be assigned to species, and 53 morphotypes cannot be assigned to any known of genus or species. The identified species included 1 species in Gatesclarkeanini, 8 species in Bactrini, 42 species in Olethreutini, 7 species in Enarmoniini, 30 species in Eucosmini, and 21 species in Grapholitini. Most of the Olethreutinae in the park are widely distributed in different habitat type and at a wide range of elevation from 100-1,200 m. However, the number of species associated with each habitat type, elevation and season are more limited.

The 54 speices that are new records for Thailand and for Thong Pha Phum National Park include the following: *Bactra honesta, B. orbiculi, Bubonoxena spirographa, Syntozyga pedias, Arcesis anax, Argyroptocha phalaenopa, Dactylioglypha pallens, Dudua charadraea, Megalota fallax, Neohermenias thalassitis, Neopotamia cathemacta, Semutophila saccaropa, Sorolopha archimedias, S. stygiuala, Anathamna spermatophaga, Ancylis celerata, A. leutescens, Loboschiza koenigiana, Tetramoera flavencens, Acroclita cheradota, A. lithoxoa, A. nigrovenana, Aemulatrix aequilibra, Bipartivalva aquilana, Emrahia hoplista, Epinotia canthonias, Eucoenogenes munda, Eucosma calligrapha, Eucosma mollita, Gypsonoma anthracitis, G. infuscana, Heleanna physalodes, Herpystis mica, Noduliferola niphada, Pelochrista pollinaria, Rhopobota antecellana, Spilonota babylonica, Strepsicrates discobola, Tritopterna anachastopa, Acanthoclita balanoptycha, A. balia, Andrioplecta dierli, A. subpulverula, Cimeliomorpha cymbalora, Cydia celiae, C. malesana, C. obumbrana, Fulcrifera tricentra, Grapholita comanticosta, G. dysaethria, G. seclusana, Microsarotis lucida, M. palamedes, Procoronis swinhoeiana.* Of these, *Eucoenogenes munda* was assigned to be new combination. Futhermore,

Eucoenogenes bicuculla Pinkaew and *E. vaneeae* Pinkaew were found and described as new species.

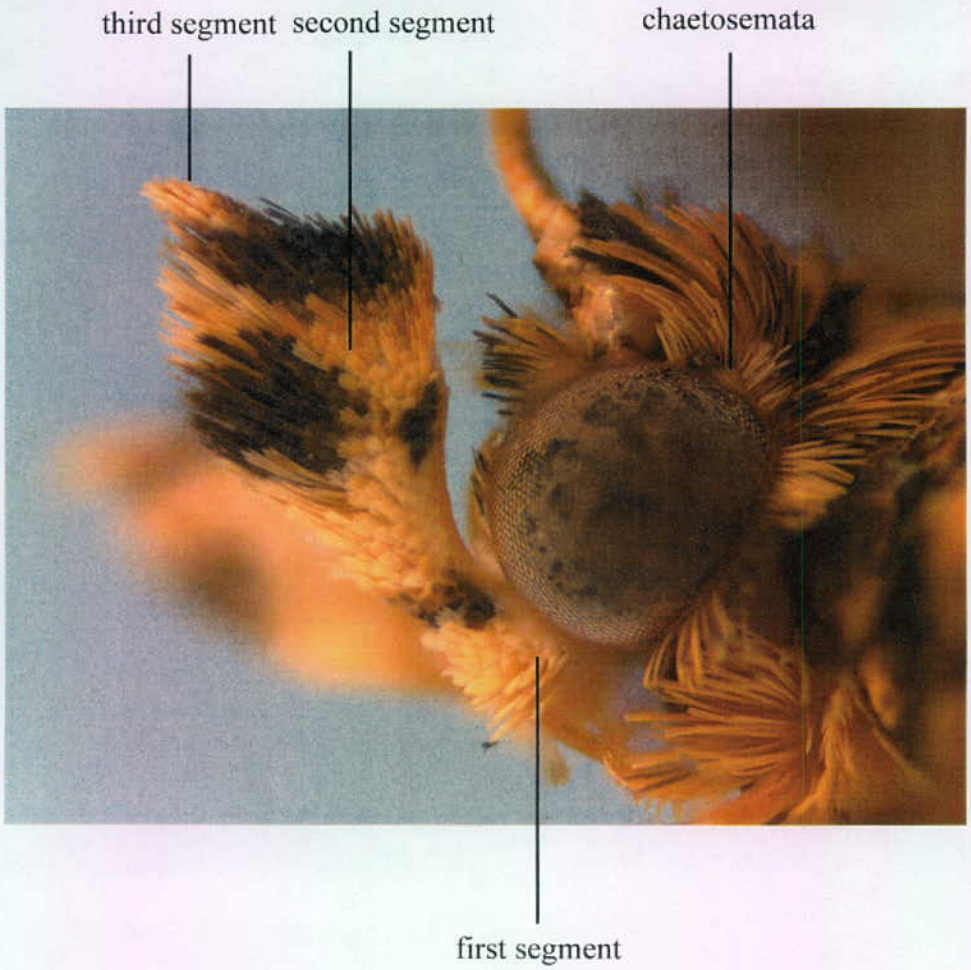


Figure 1 Lateral view of head *Eucoenogenes vaneeae* Pinkaew with three-segmented labial palpus and chaetosemata.

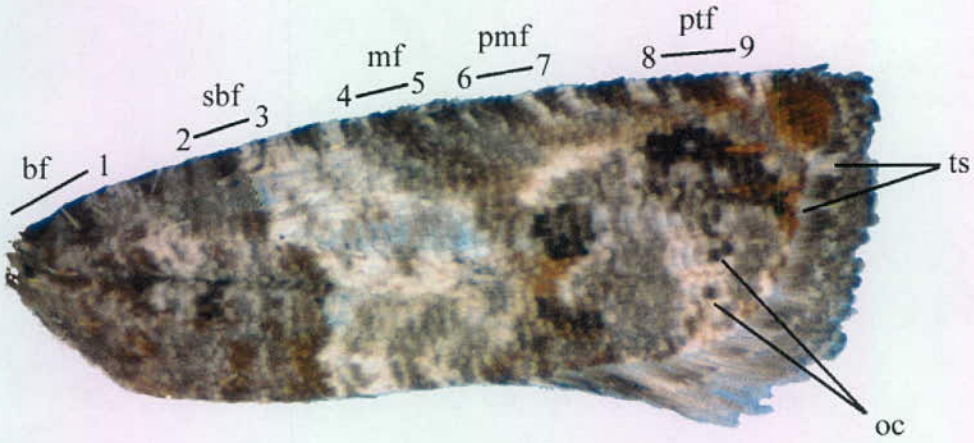


Figure 2 Forewing pattern; bf (basal fascia), mf (median fascia), oc (ocellus), pmf (postmedian fascia), ptf (preterminal fascia), sbf (subbasal fascia), ts (terminal strigulae), 1-9 (costal paired sterigulae).

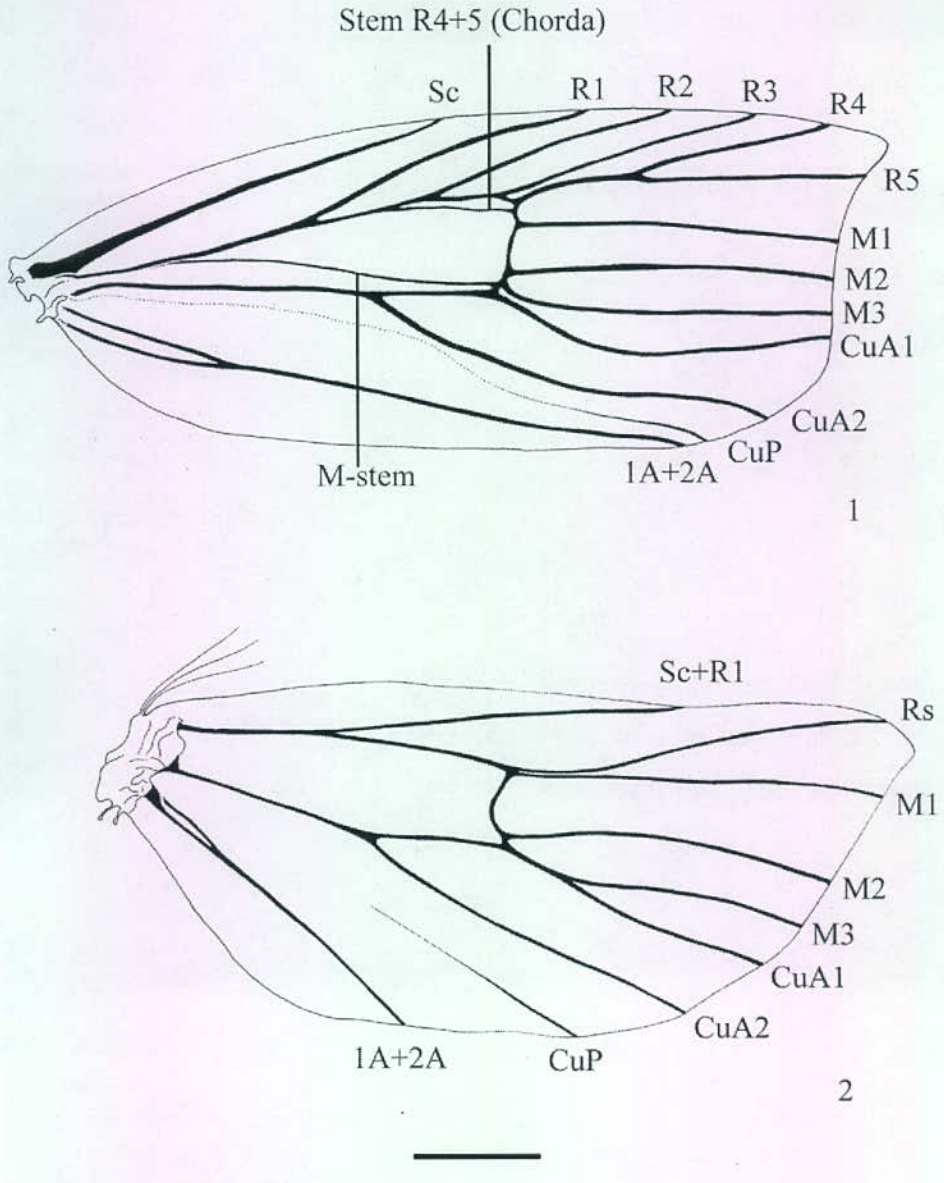


Figure 3 Wing venation of *Eucoenogenes munda* (Diakonoff). 3.1. Forewing. 3.2. Hindwing. CuA1 (cubitus anterior 1), CuA2 (cubitus anterior 2), CuP (cubitus posterior), M1 (median 1), M2 (median 2), M3 (median 3), R1 (radius 1), R2 (radius 2), R3 (radius 3), R4 (radius 4), R5 (radius 5), Rs (radius sector), Sc (subcosta), Sc+R1 (subcosta+radius 1), Stem R4+R5 (stem of radius 4+radius 5)(chorda), M-stem (median stem). Scale = 0.5 mm.

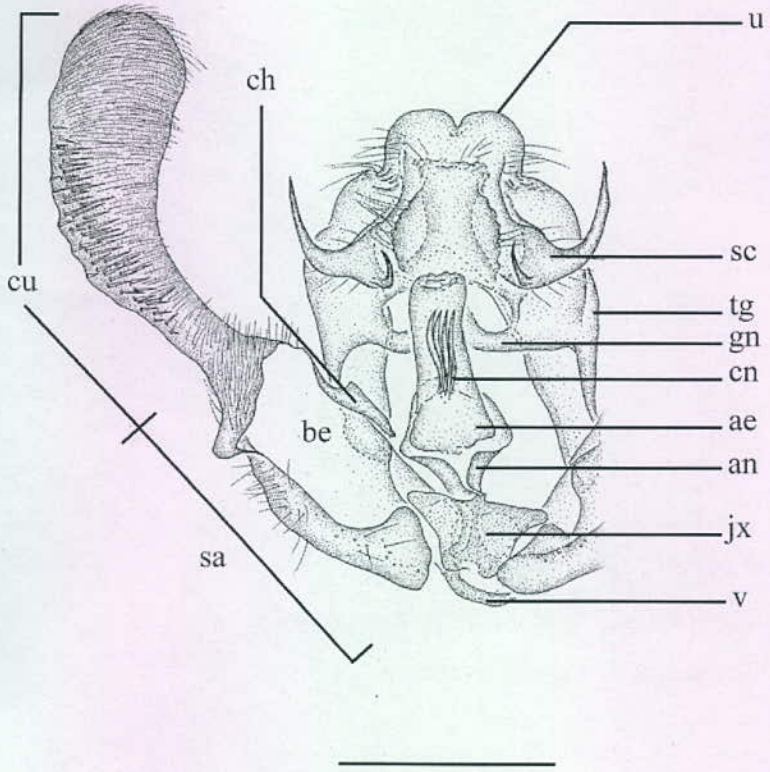


Figure 4 Male genitalia of *Acroclita subsequana* (Herrich-Schäffer); ae (aedeagus), an (anellus), be (basal excavation), ch (costal hook, cn (cornuti), cu (cucullus), gn (gnathos), jx (juxta), sa (sacculus), sc (socii), tg (tegumen), u (uncus), v (vinculum). Scale = 0.5 mm.

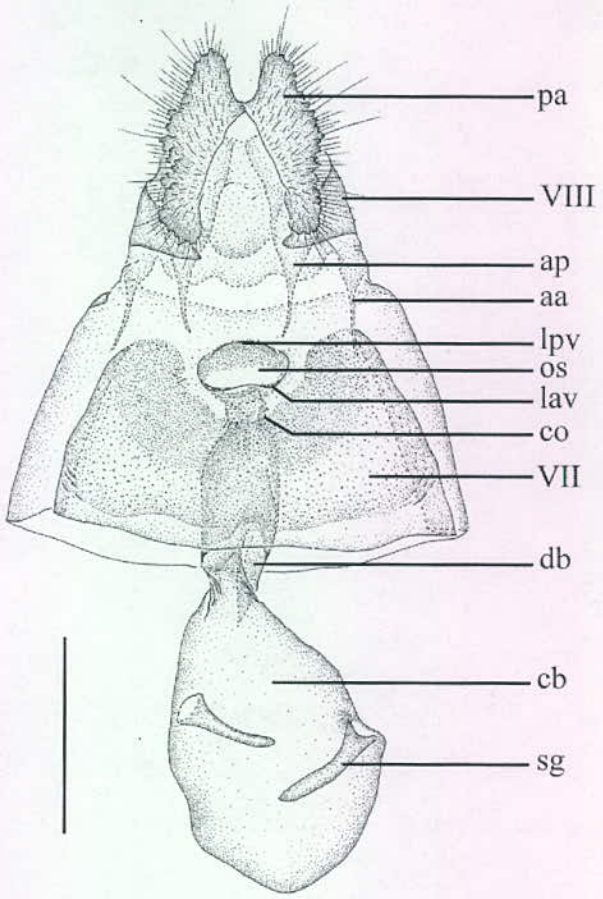
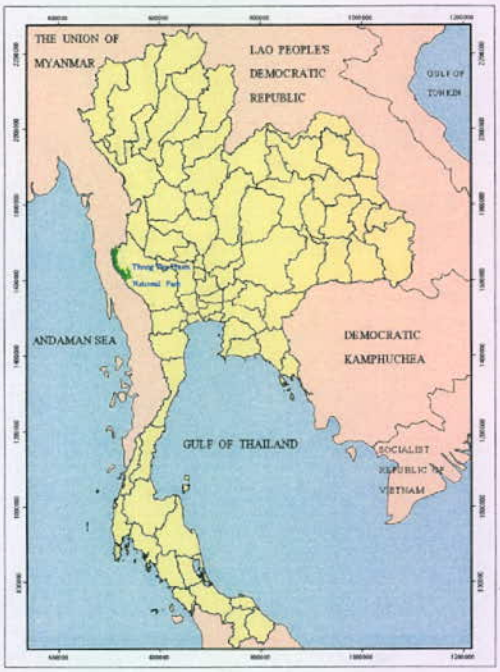


Figure 5 Female genitalia of *Acroclita subsequana* (Herrich-Schäffer); aa (apophyses anterior), ap (apophyses posterior), cb (corpus bursa), co (colliculum), db (ductus bursa), lav (lamella antevaginalis), lpv (lemella postvaginalis), os (ostium bursa), pa (papillae anales), sg (signa), VII (sternum 7), VIII (sternum 8). Scale = 0.5 mm.



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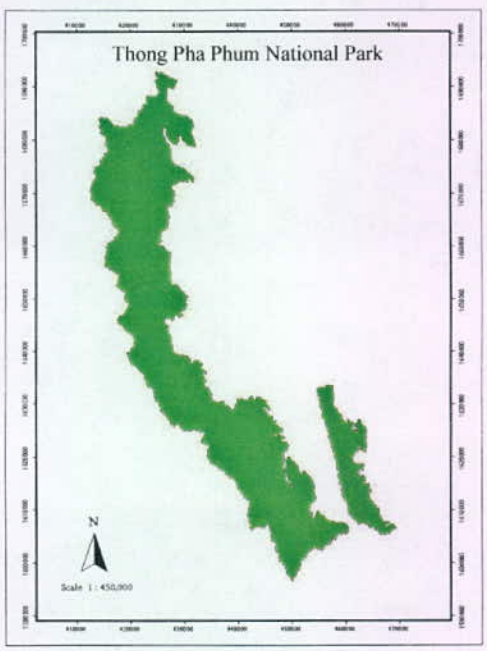

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Figure 6 Map of Thong Pha Phum National Park.
6.1. Location of Thong Pha Phum National Park in Thailand.
6.2. Boundary of Thong Pha Phum National Park.

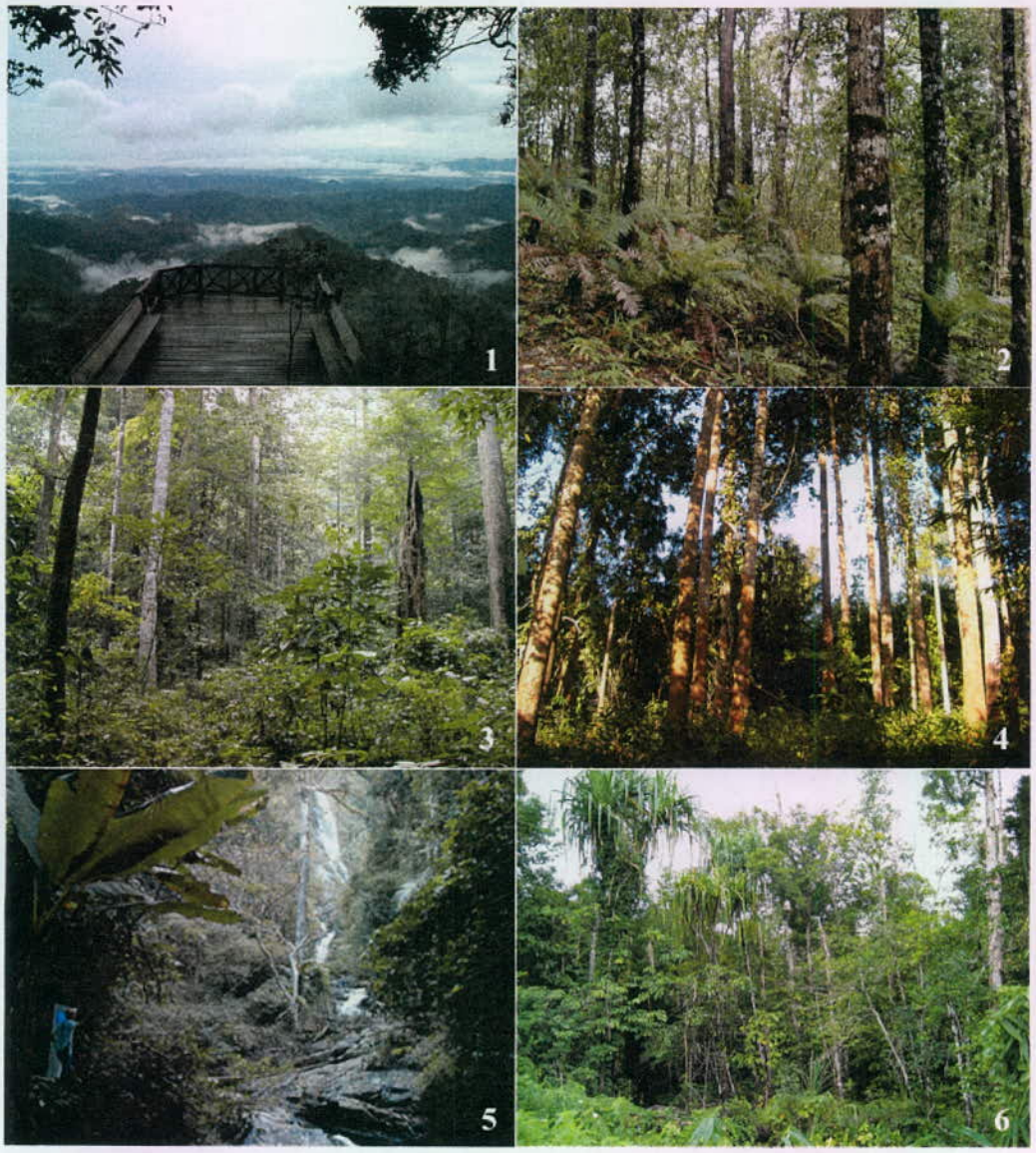


Figure 7 Habitat types for collecting in Thong Pha Phum National Park;
7.1. Scenery of Thong Pha Phum National Park,
7.2. Hill evergreen forest, 7.3. Dry evergreen forest,
7.4. Mixed deciduous forest, 7.5. Riparian forest, 7.6. Swamp forest.

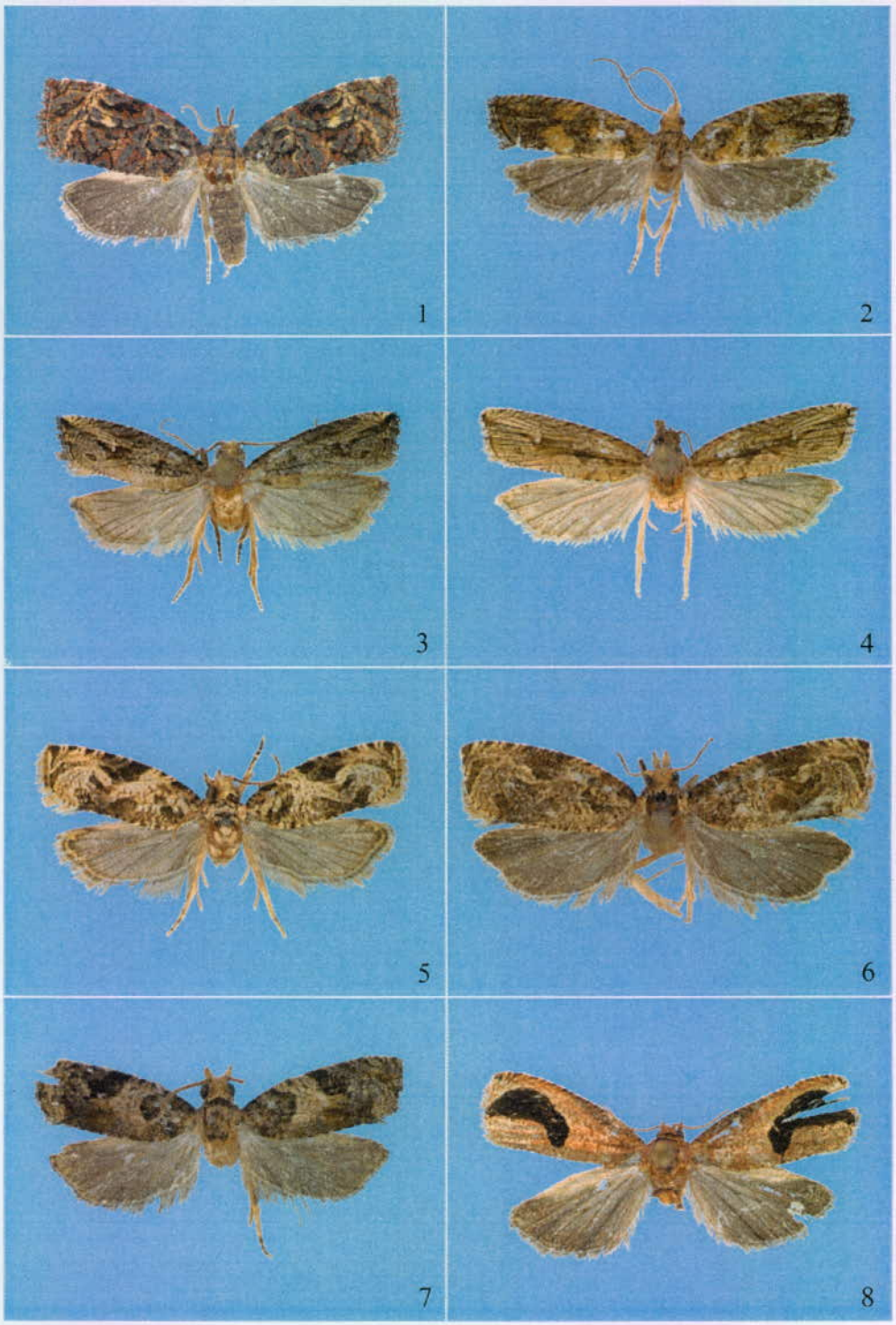


Figure 8 Adults. 8.1. *Gatesclarkeana idia* Diakonoff, ♂ (6.41 mm). 8.2. *Bactra cerata* (Meyrick), ♂. (5.01 mm). 8.3. *B. coronata* Diakonoff, ♂ (5.90 mm). 8.4. *B. venosana* (Zeller), ♂ (5.77 mm). 8.5. *Bubonoxena spirographa* Diakonoff, ♂ (5.75 mm). 8.6. *B.* sp. A, ♀ (5.80 mm). 8.7. *Syntozyga pedias* (Meyrick), ♂ (4.76 mm). 8.8. *Apsidophora purpurorbis* Diakonoff, ♀ (8.67 mm).

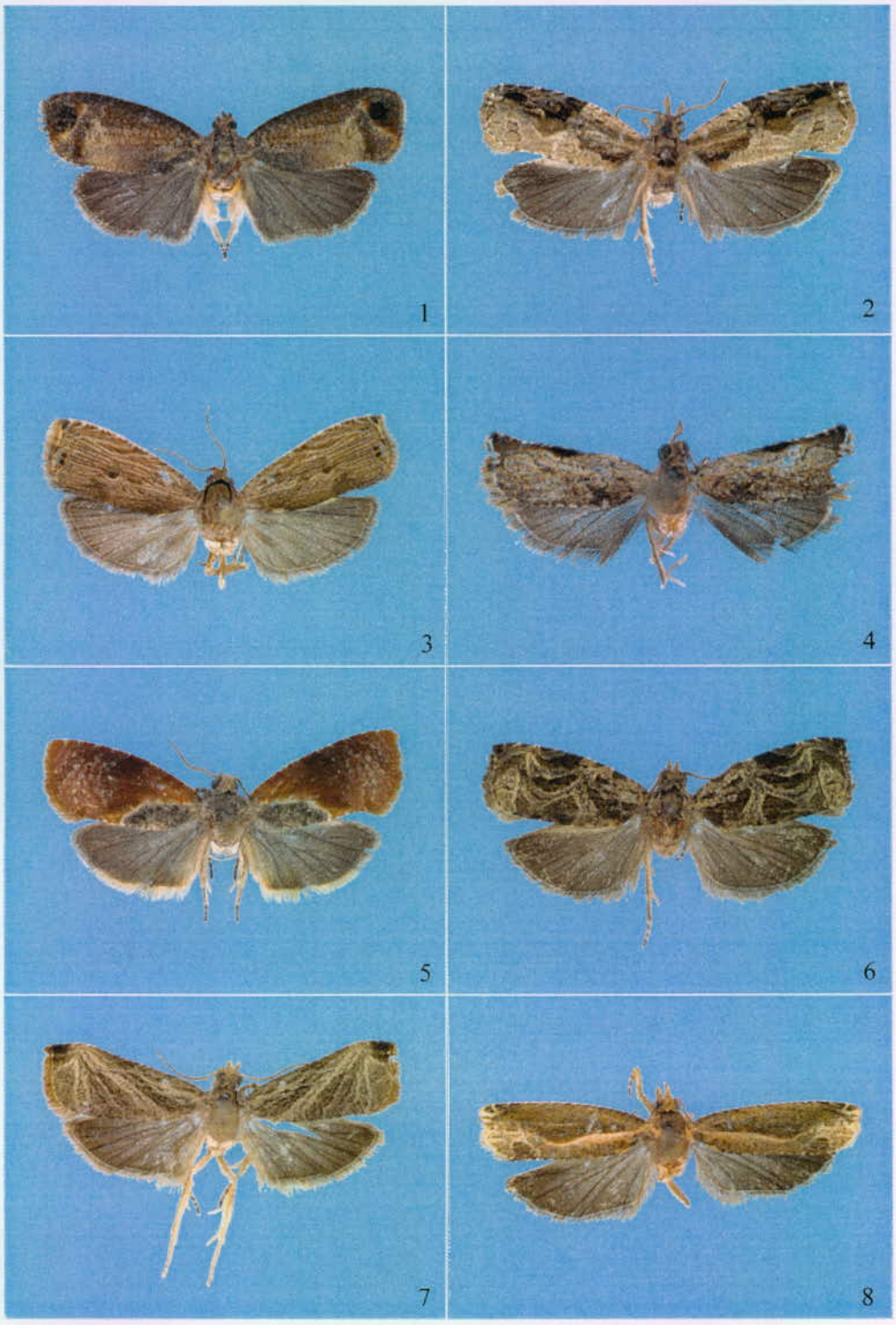


Figure 9 Adults. 9.1. *Arcesis anax* Diakonoff, ♂ (11.13 mm). 9.2. *Archilobesia* sp. A, ♂ (7.91 mm). 9.3. *Argyroptocha phalaenopa* Diakonoff, ♂ (9.08 mm). 9.4. *Balbidomaga* sp. A, ♂ (4.26 mm). 9.5. *Cymolomia phaeopelta* (Meyrick), ♂ (7.47 mm). 9.6. *Dactylioglypha pallens* Diakonoff, ♂ (5.45 mm). 9.7. *D. tonica* (Meyrick), ♂ (5.83 mm). 9.8. *Dicephalarcha herbosa* (Meyrick), ♀ (6.50 mm).

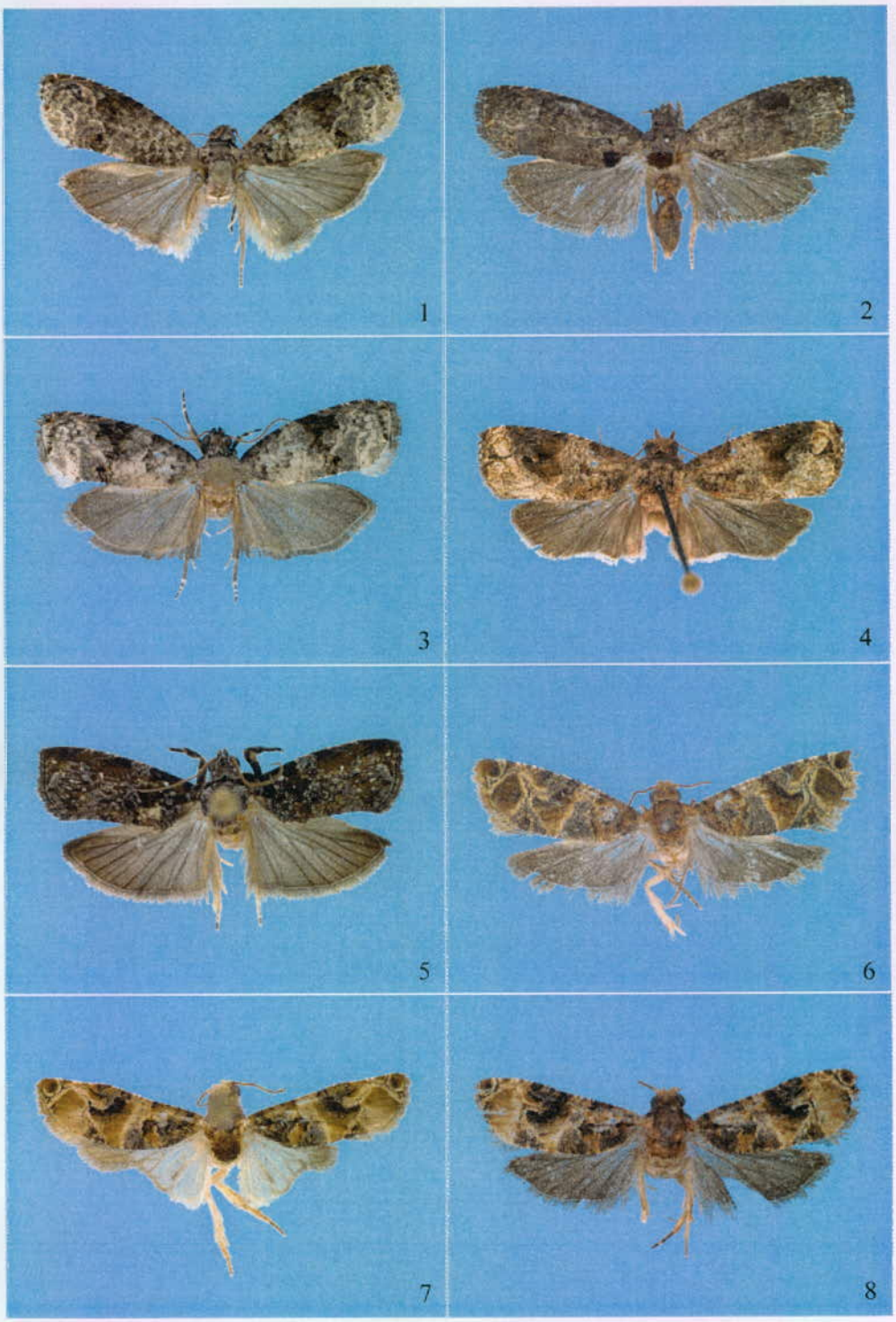


Figure 10 Adults. 10.1. *Dudua aprobola* (Meyrick), ♀ (7.50 mm). 10.2. *D. brachytoma* Diakonoff, ♂ (7.27 mm). 10.3. *D. charadraea* (Meyrick), ♂ (6.88 mm). 10.4. *Gnathmocerodes* sp. A, ♂ (8.70 mm). 10.5. *Hoplitendimis* sp. A, ♂ (6.92 mm). 10.6. *Lobesia aeolopa* Meyrick, ♂ (4.36 mm). 10.7. *L. genialis* Meyrick, ♂ (5.42 mm). 10.8. *L. kurokoi* Bae, ♀ (4.91 mm).

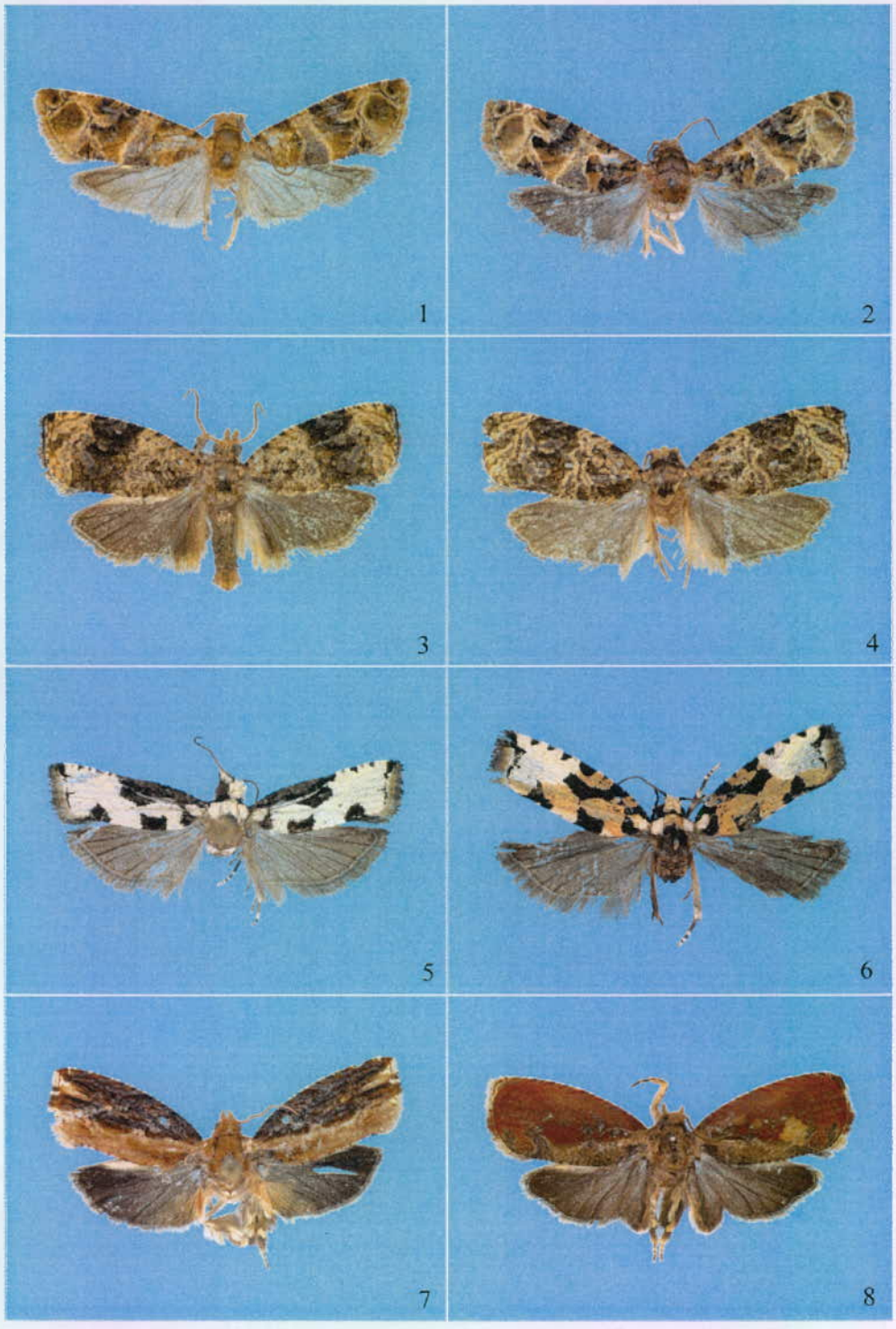


Figure 11 Adults. 11.1. *Lobesia lithogonia* Diakonoff, ♂ (5.21 mm). 11.2. *L.* sp. A, ♀ (5.22 mm). 11.3. *Megalota fallax* Diakonoff, ♂ (5.73 mm). 11.4. *M. vera* Diakonoff, ♂ (5.52 mm). 11.5. *Neohermenias thalassitis* (Meyrick), ♂ (6.04 mm). 11.6. *N.* sp. A, ♀ (7.27 mm). 11.7. *Neopotamia cathemacta* Diakonoff, ♂ (8.31 mm). 11.8. *N. formosa* Kawabe, ♂ (6.68 mm).

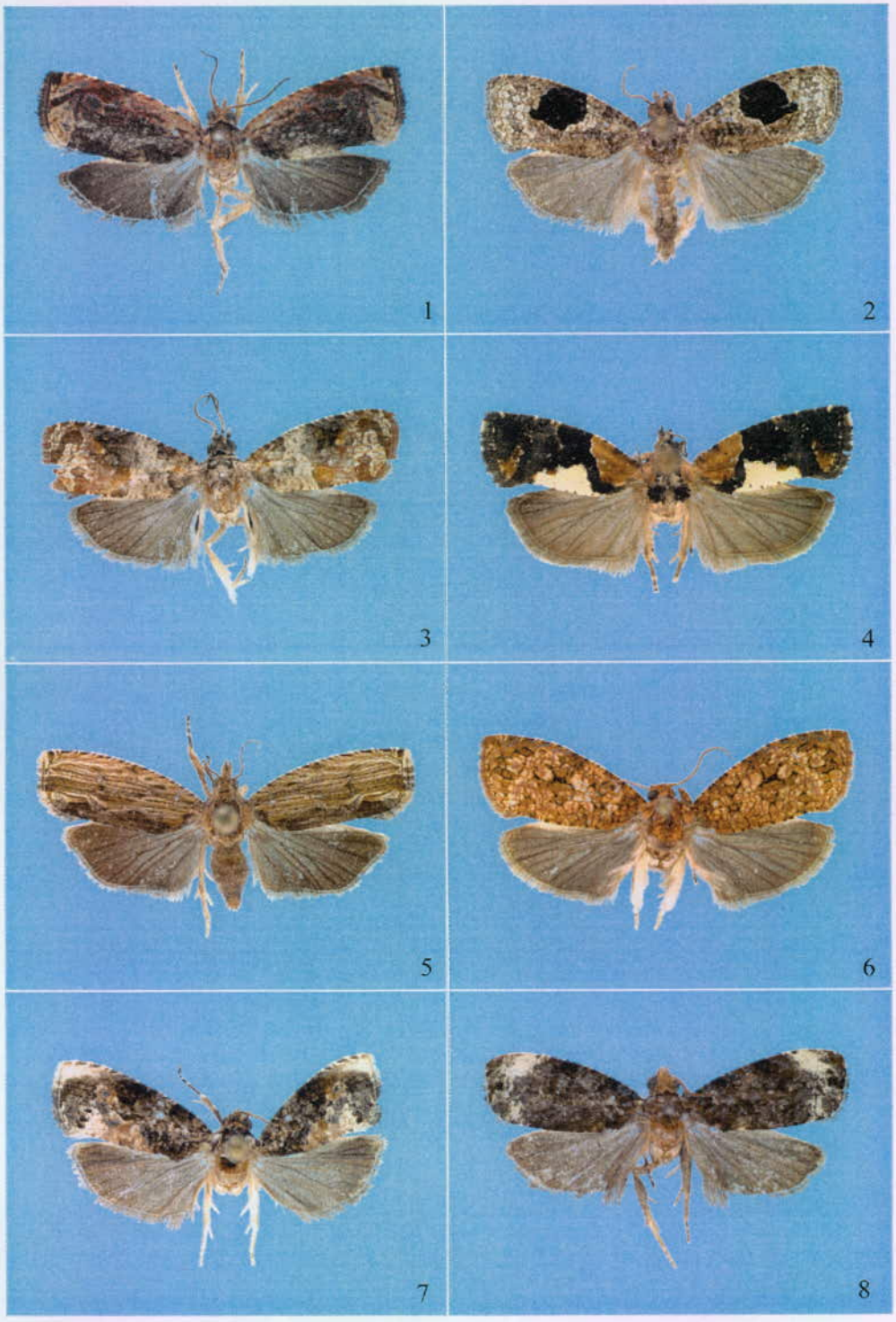


Figure 12 Adults. 12.1. *Neopotamia* sp. A, ♂ (5.54 mm). 12.2. *Ophiorrhabda mormopa* (Meyrick), ♂ (7.27 mm). 12.3. *O. philocompsa* (Meyrick), ♂ (6.40 mm). 12.4. *Penthostola albomaculatis* (Liu & Bai), ♂ (7.16 mm). 12.5. *Phaecadophora fimbriata* Walsingham, ♂ (8.62 mm). 12.6. *Phaecasiophora walsinghami* Diakonoff, ♂ (9.88 mm). 12.7. *Phaulacantha metamelas* Diakonoff, ♂ (7.58 mm). 12.8. *Rhodacra parvusa* Kawabe, ♂ (5.64 mm).

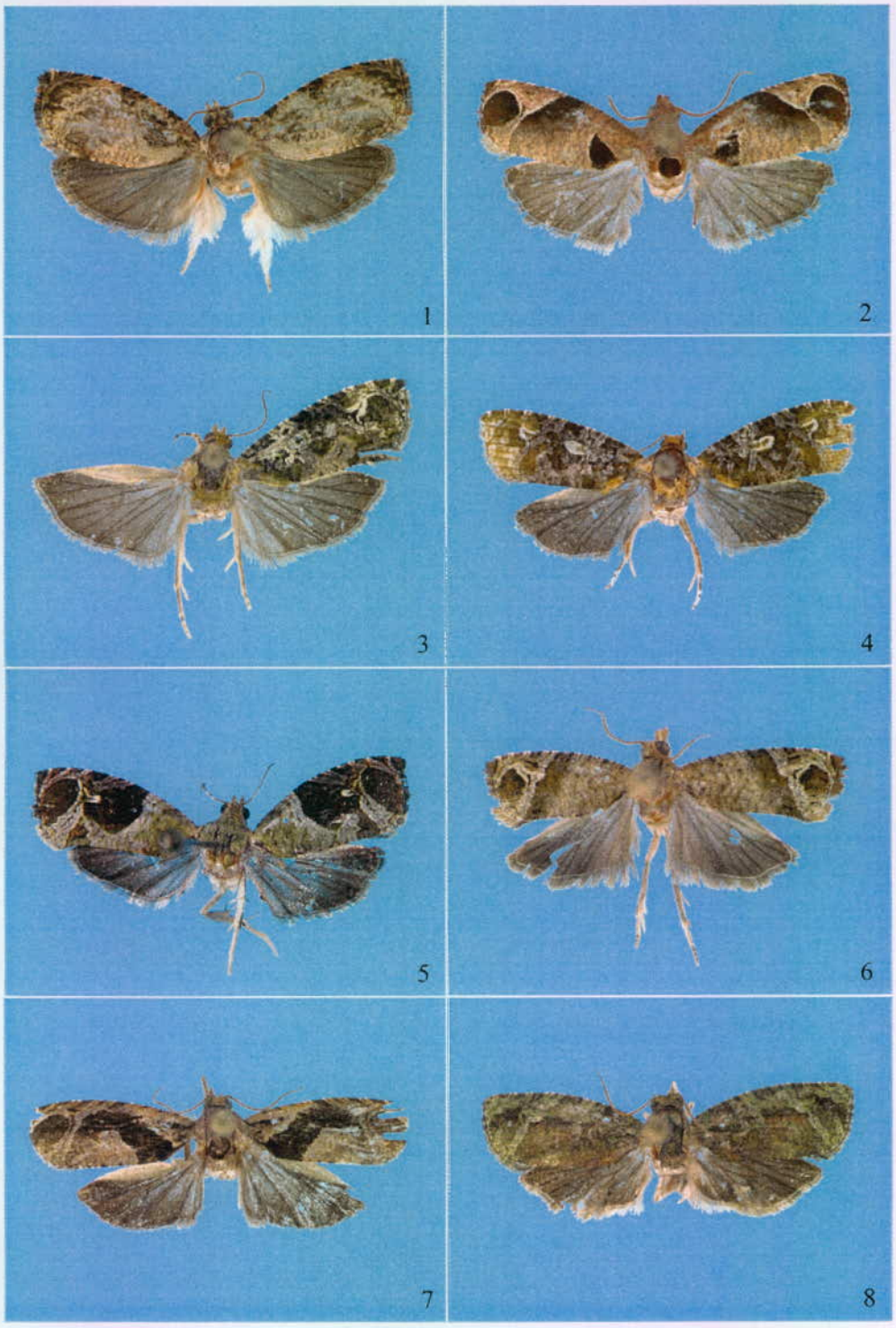


Figure 13 Adults. 13.1. *Sisona albitibiana* (Snellen), ♂ (7.17 mm). 13.2. *Sorolopha archimedias* Lower, ♂ (5.73 mm). 13.3. *S. herbifera* (Meyrick), ♂ (8.31 mm). 13.4. *S. nagaii* Kawabe, ♀ (9.68 mm). 13.5. *S. semiculta* (Meyrick), ♀ (7.36 mm). 13.6. *S. sphaerocopa* (Meyrick), ♂ (6.15 mm). 13.7. *S. stygiaula* (Meyrick), ♂ (7.92 mm). 13.8. *S.* sp. A, ♂ (6.59 mm).

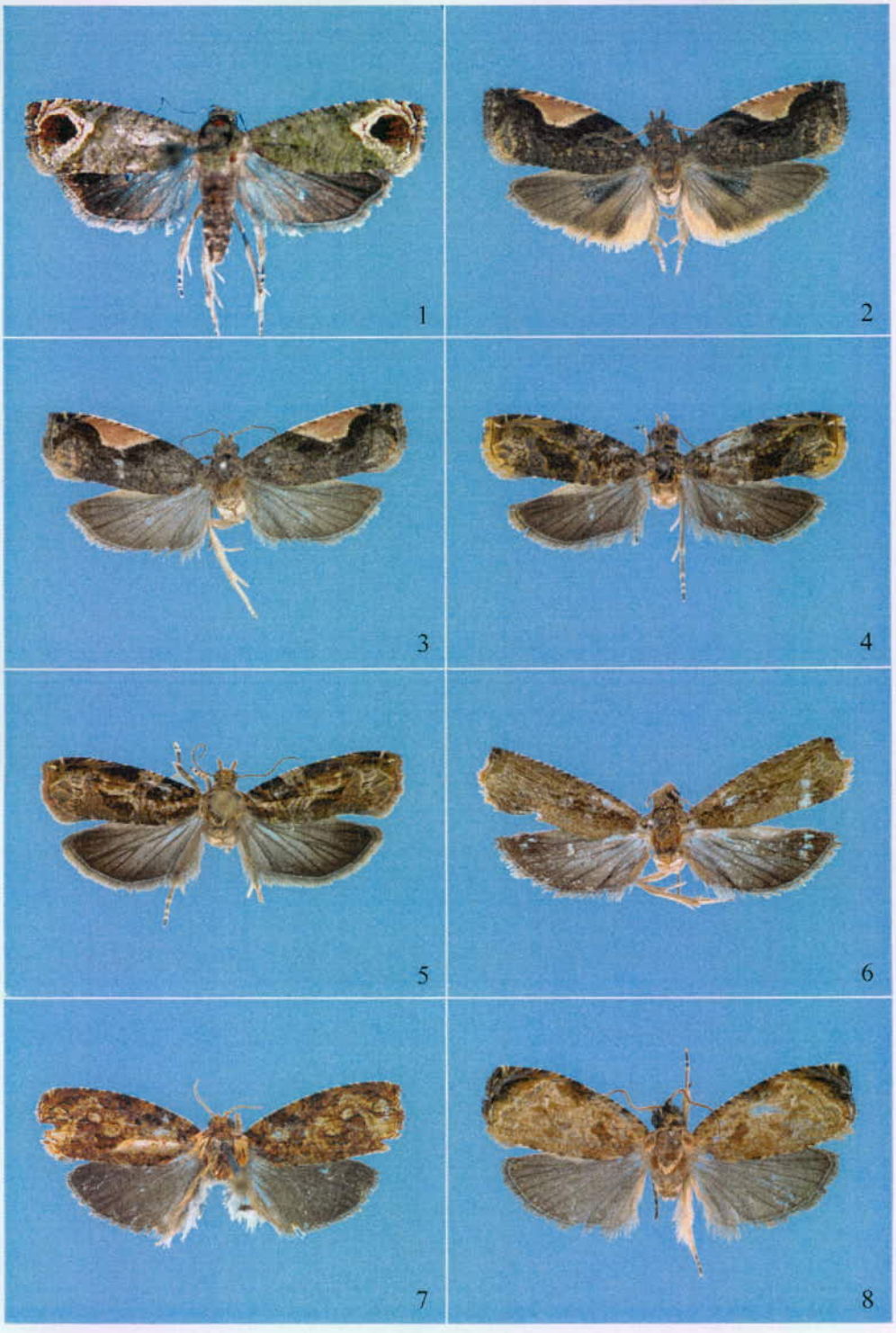


Figure 14 Adults. 14.1. *Sorolopha sp. B*, ♀ (7.25 mm). 14.2. *Statherotis discana* (Felder & Rogenhofer), ♂ (6.36 mm). 14.3. *S. leucaspis* (Meyrick), ♀ (6.53 mm). 14.4. *S.* sp. A, ♀ (5.09 mm). 14.5. *S.* sp. B, ♀ (6.86 mm). 14.6. *S.* sp. D, ♂ (6.13 mm). 14.7. *Sycacantha* sp. A, ♂ (8.01 mm). 14.8. *S.* sp. B, ♂ (7.25 mm).

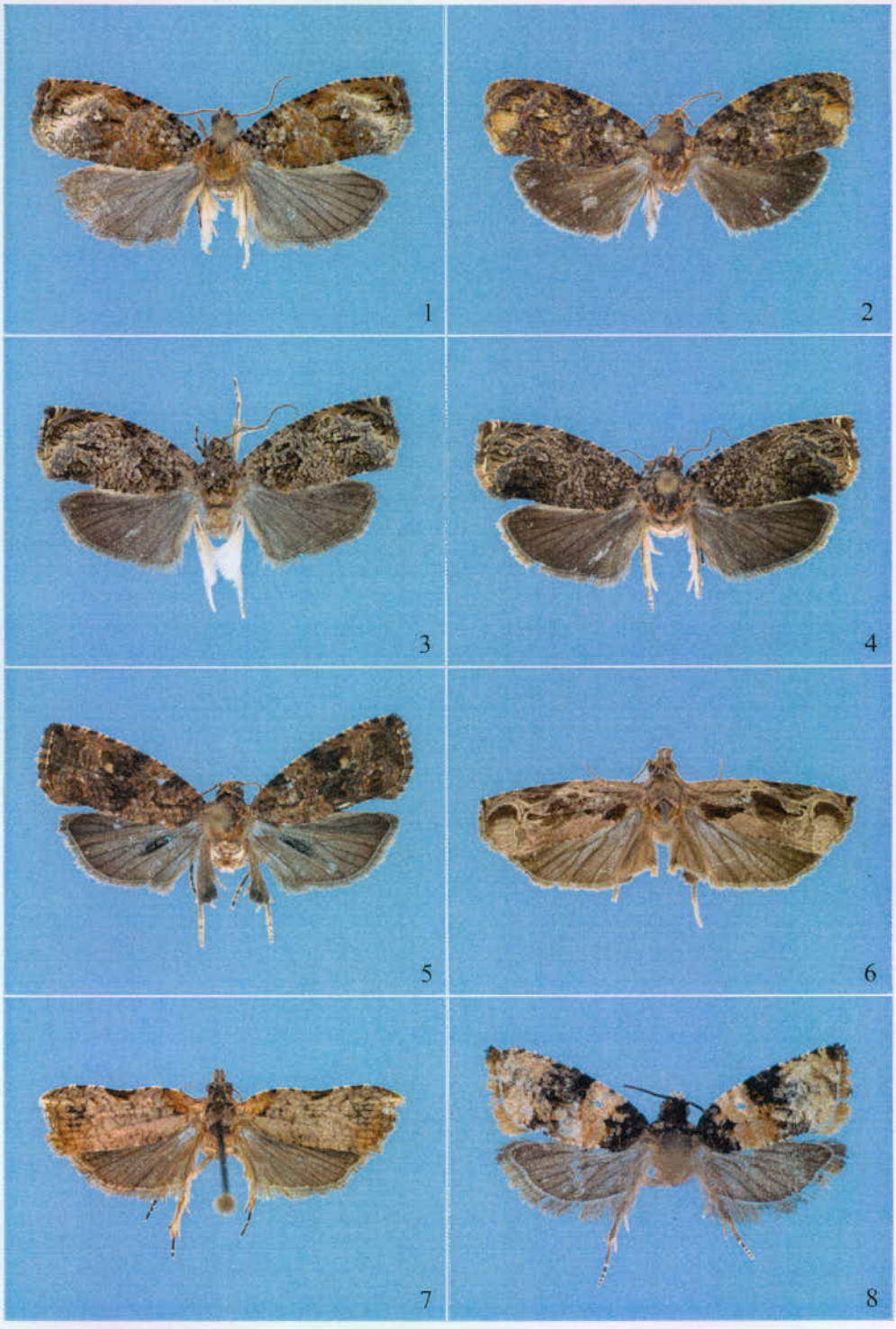


Figure 15 Adults. 15.1. *Sycacantha* sp. C, ♂ (8.68 mm). 15.2. *S.* sp. D, ♂ (6.67 mm). 15.3. *S.* sp. E, ♂ (7.50 mm). 15.4. *S.* sp. F, ♀ (9.22 mm). 15.5. *Teleta talalis* (Durrant), ♂ (7.75 mm). 15.6. *Temnolopha matura* Diakonoff, ♂ (8.92 mm). 15.7. *Thysanocrepis crossota* Meyrick, ♂ (7.60 mm). 15.8. Olethreutini genus A sp. A, (4.81 mm).

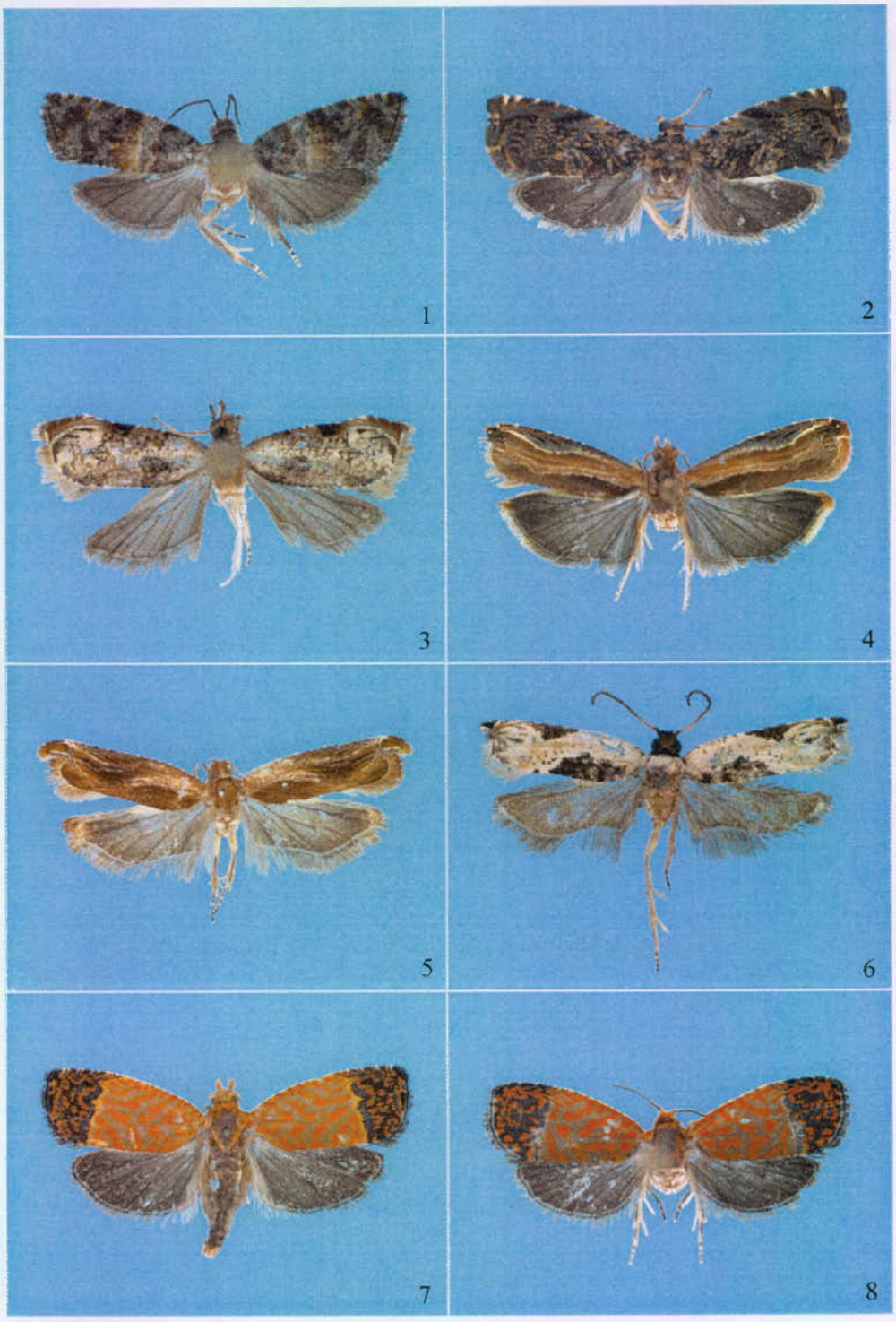


Figure 16 Adults. 16.1. Olethreutini genus C sp. A, ♂ (4.81 mm). 16.2. *Anathamna spermatophaga* Diakonoff & Bradley, ♂ (5.90 mm). 16.3. *A.* sp. A, ♂ (5.31 mm). 16.4. *Ancylis anthophanes* Meyrick, ♂ (7.17 mm). 16.5. *A. aromatias* Meyrick, ♀ (6.68 mm). 16.6. *A. cerelata* (Meyrick), ♂ (4.13 mm). 16.7. *Loboschiza koenigiana* (Fabricius), ♂ (5.02 mm). 16.8. *L.* sp. A, ♂ (5.10 mm).

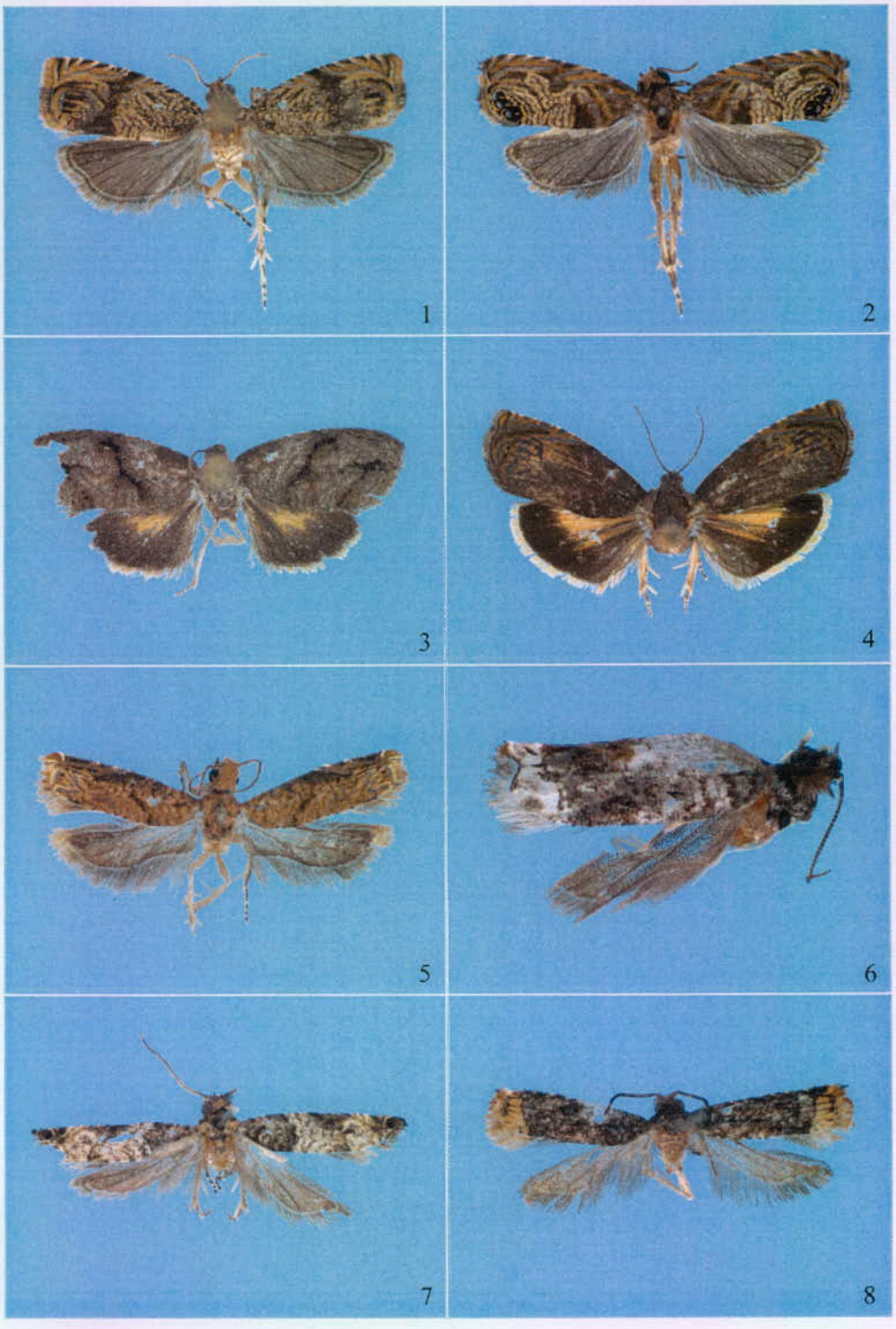


Figure 17 Adults. 17.1. *Tetramoera flavencens* Kuznetsov, ♂ (5.45 mm). 17.2. Enarmoniini genus A sp. A, ♂ (5.40 mm). 17.3. Enarmoniini genus B sp. A, ♂ (6.13 mm). 17.4. Enarmoniini genus C sp. A, ♀ (7.61 mm). 17.5. Enarmoniini genus D sp. A, ♂ (4.27 mm). 17.6. Enarmoniini genus E sp. A, ♂ (4.40 mm). 17.7. Enarmoniini genus F sp. A, ♂ (4.36 mm). 17.8. Enarmoniini genus G sp. A, ♂ (3.23 mm).

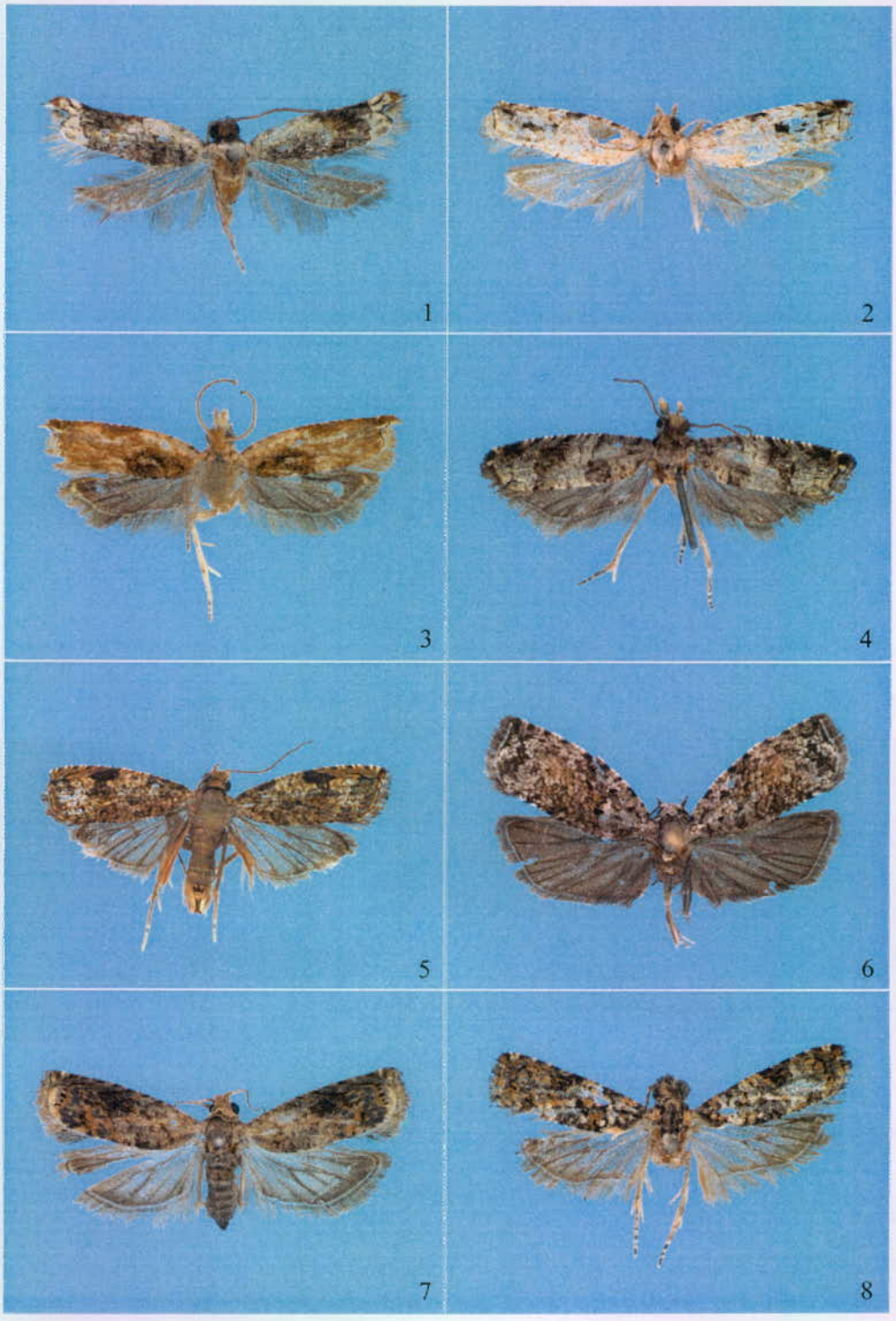


Figure 18 Adults. 18.1. Enarmoniini genus H sp. A, ♀ (3.77 mm). 18.2. Enarmoniini genus J sp. A, ♀ (4.45 mm). 18.3. *Acroclita cheradota* Meyrick, ♂ (4.77 mm). 18.4. *A. lithoxoa* Diakonoff, ♀ (4.81 mm). 18.5. *A. macrosaris* (Meyrick), ♂ (6.43 mm). 18.6. *Assulella archaea* Diakonoff, ♂ (8.38 mm). 18.7. *Coniostola* sp. A, ♀ (4.72 mm). 18.8. *Epinotia canthonias* Hübner, ♂ (4.15 mm).

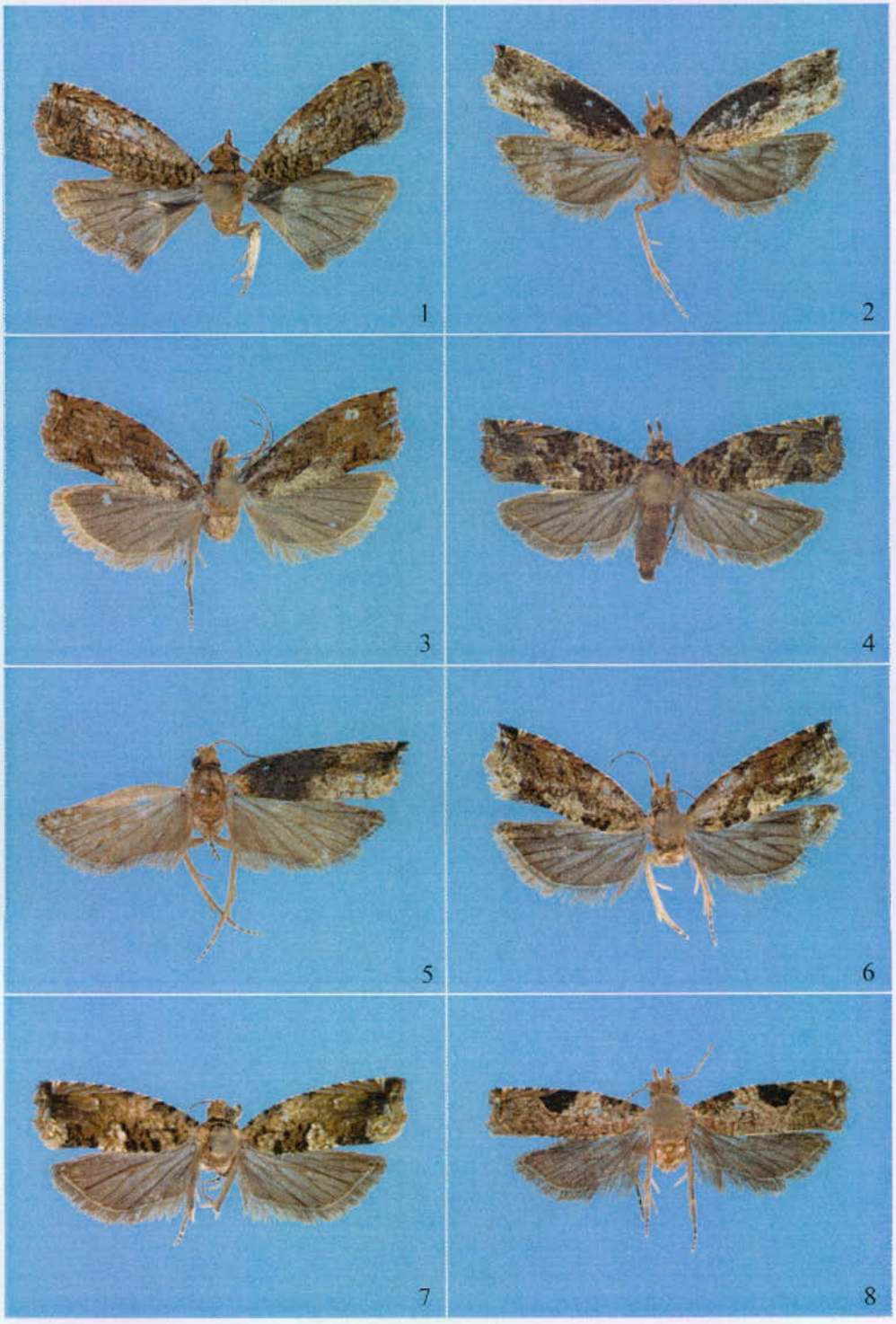


Figure 19 Adults. 19.1. *Eucoenogenes bicuculla* Pinkaew, ♂ (6.50 mm). 19.2. *E. cyanopsis* (Meyrick), ♂ (6.13 mm). 19.3. *E. munda* (Diakonoff), ♂ (7.32 mm). 19.4. *E. vaneeae* Pinkaew, ♀ (6.34 mm). 19.5. *E.* sp. D, ♂ (6.83 mm). 19.6. *E.* sp. E, ♀ (6.77 mm). 19.7. *E.* sp. F, ♀ (7.50 mm). 19.8. *E.* sp. G, ♀ (4.75 mm).

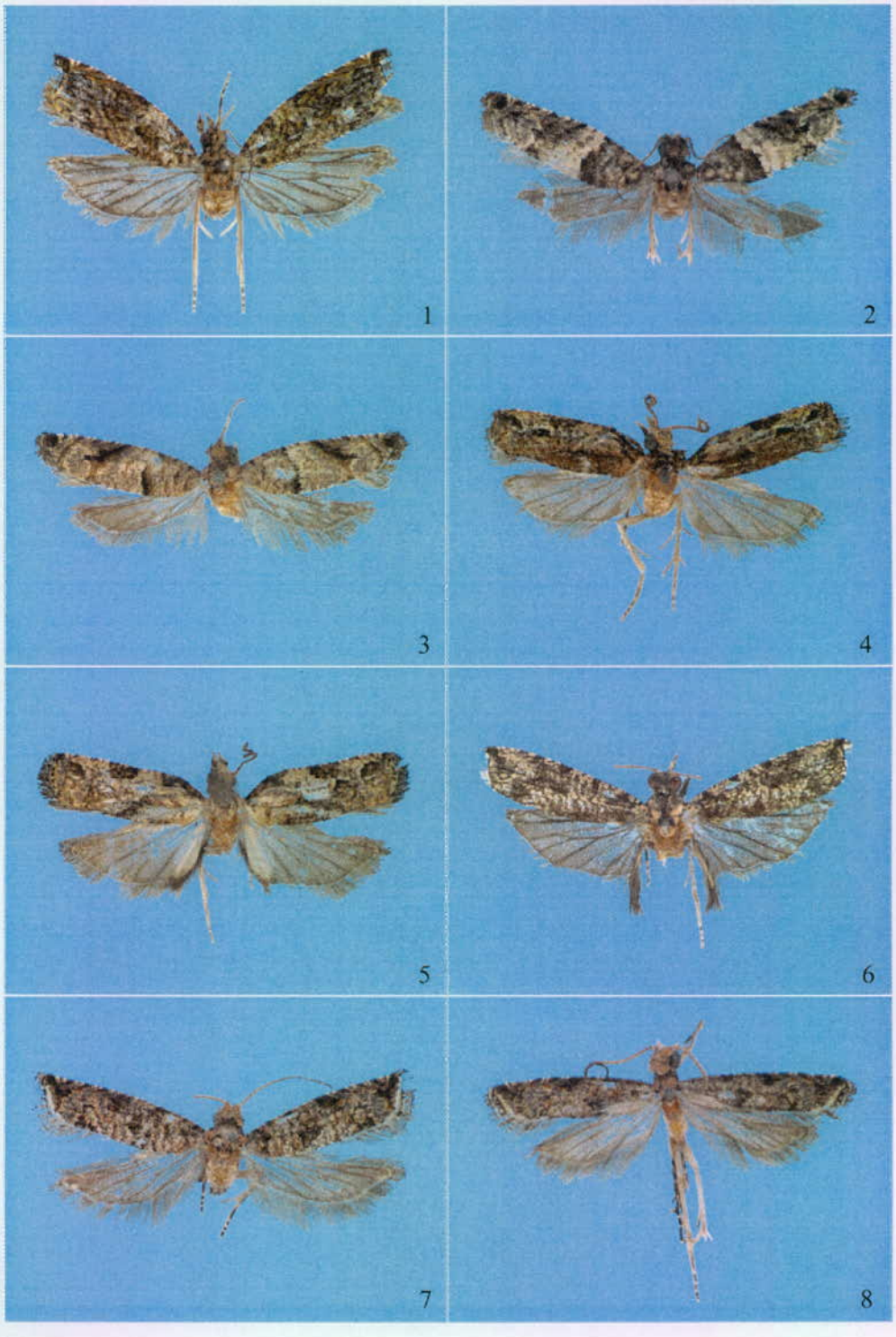


Figure 20 Adults. 20.1. *Eucoenogenes* sp. H, ♀ (6.13 mm). 20.2. *Gypsonoma anthrasitis* Meyrick, ♂ (3.90 mm). 20.3. *G. infuscana* Kuznetsov, ♀ (4.03 mm). 20.4. *Heleanna physalodes* (Meyrick), ♂ (4.12 mm). 20.5. *H.* sp. A, ♂ (4.75 mm). 20.6. *Hermenias pachnitis* Meyrick, ♂ (5.72 mm). 20.7. *Herpystis* sp. A, ♀ (4.24 mm). 20.8. *H.* sp. C, ♂ (3.81 mm).

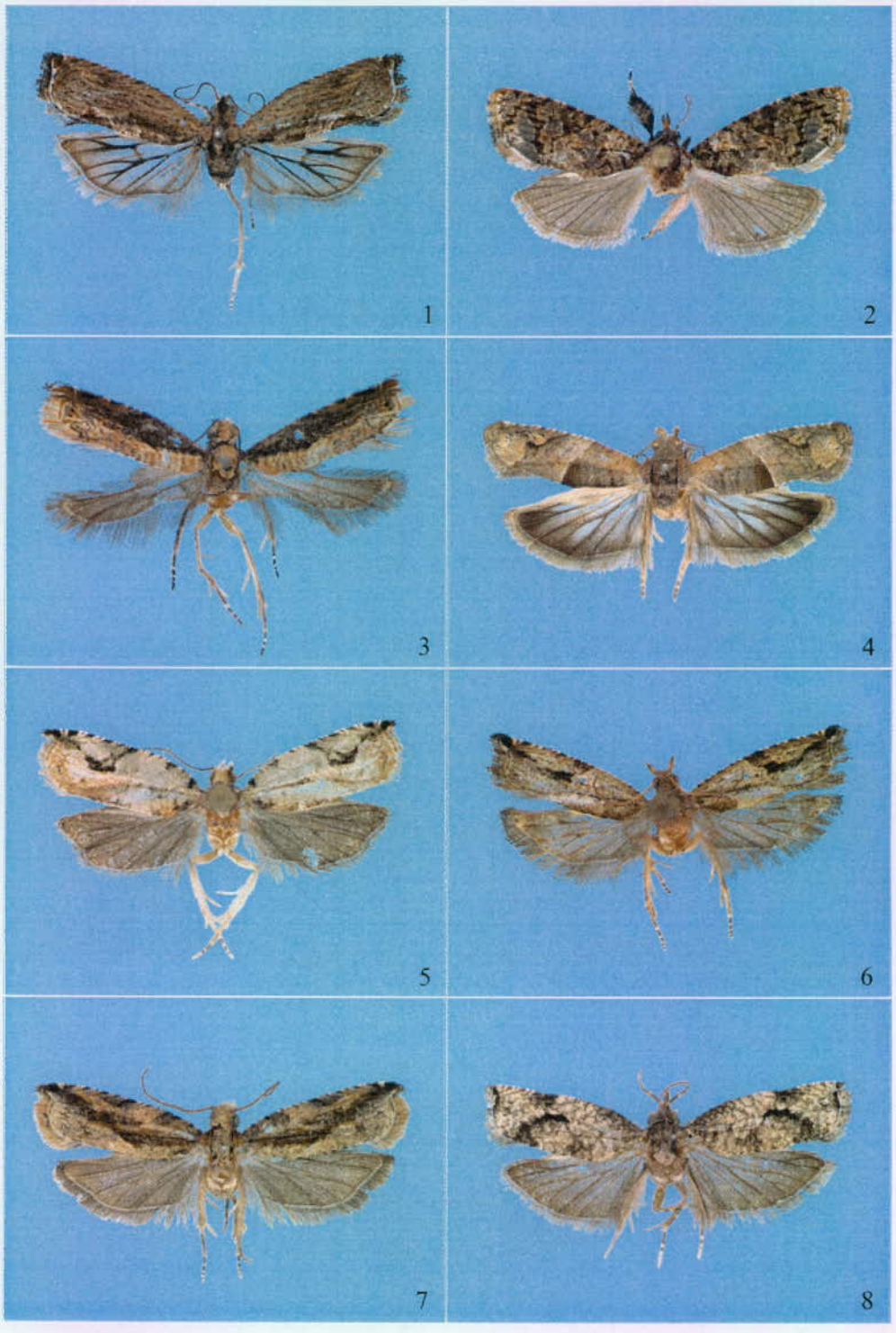


Figure 21 Adults. 21.1. *Megaherpystis melanoneura* Meyrick, ♂ (6.24 mm). 21.2. *Mesocallyntera squamosa* Diakonoff, ♀ (9.45 mm). 21.3. *Peridaedala* sp. A, ♀ (4.04 mm). 21.4. *Rhopobota antecellana* Kuznetsov, ♂ (5.11 mm). 21.5. *R.* sp. A, ♂ (5.41 mm). 21.6. *R.* sp. B, ♀ (5.30 mm). 21.7. *R.* sp. D, ♂ (5.72 mm). 21.8. *Spilonota melanocopa* (Meyrick), ♂ (6.22 mm).

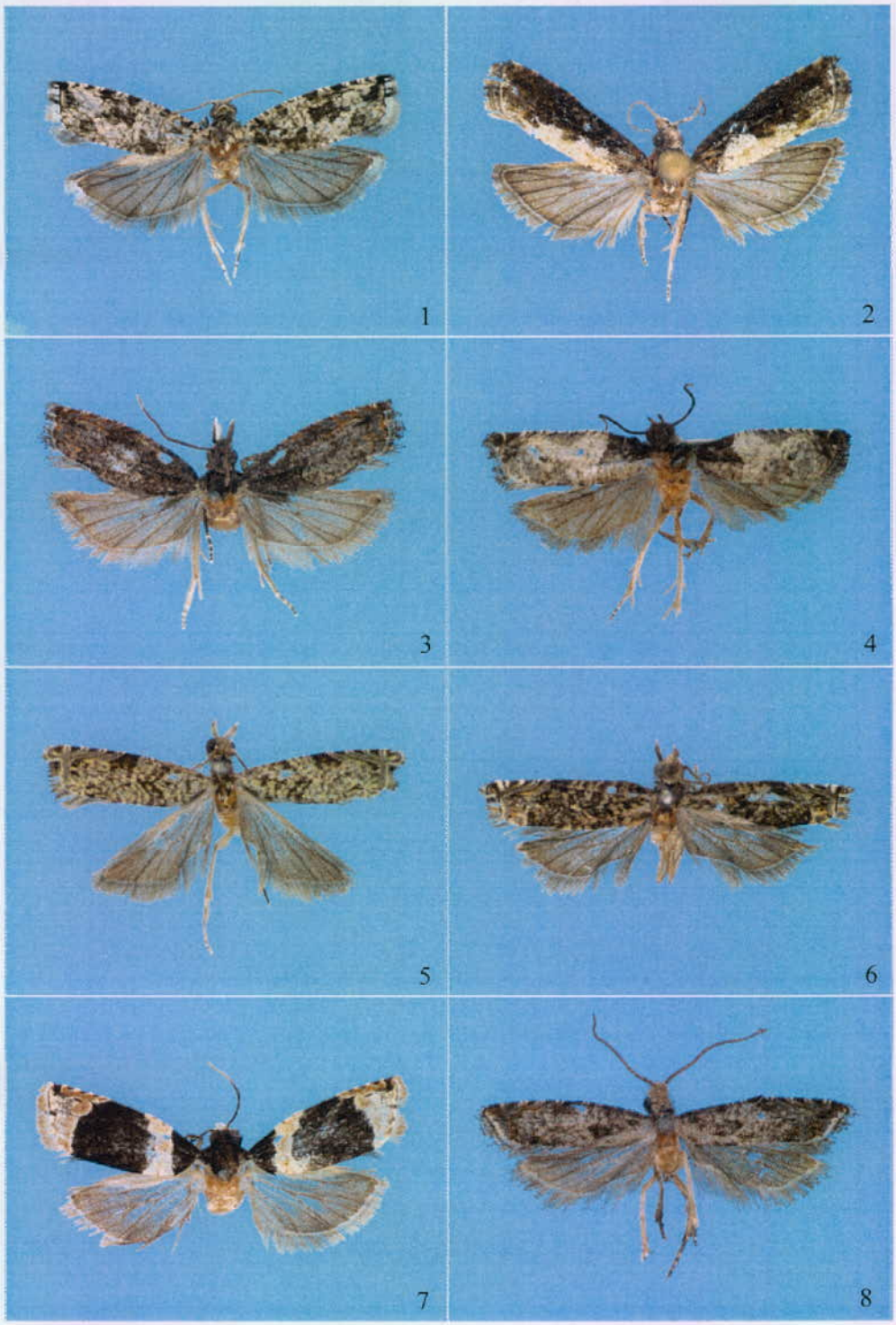


Figure 22 Adults. 22.1. *Spilonota* sp. A, ♀ (5.96 mm). 22.2. *Strepsicrates discobola* Diakonoff, ♂ (6.90 mm). 22.3. *Tritopterna anachastopa* (Meyrick), ♂ (4.54 mm). 22.4. Eucosmini genus A sp. A, ♂ (4.17 mm). 22.5. Eucosmini genus B sp. A, ♀ (4.17 mm). 22.6. Eucosmini genus D sp. A, ♂ (4.00 mm). 22.7. Eucosmini genus E sp. A, ♂ (6.31 mm). 22.8. Eucosmini genus F sp. A, ♂ (3.72 mm).

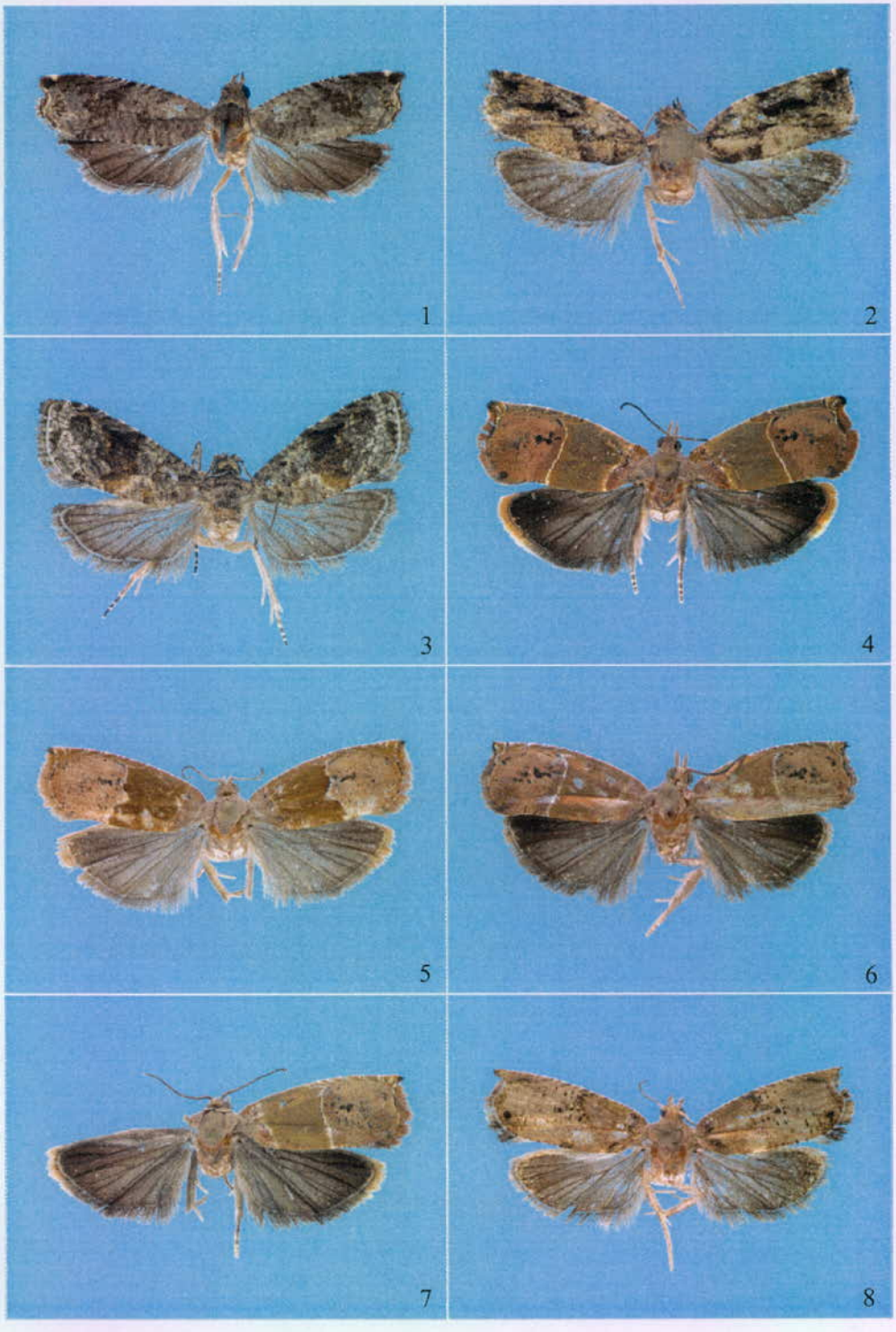


Figure 23 Adults. 23.1. Eucosmini genus H sp. A, ♀ (5.22 mm). 23.2. Eucosmini genus I sp. A, ♀ (5.31 mm). 23.3. Eucosmini genus K sp. A, ♂ (5.06 mm). 23.4. Eucosmini genus L sp. A, ♀ (8.27 mm). 23.5. Eucosmini genus L sp. B, ♀ (8.77 mm). 23.6. Eucosmini genus L sp. C, ♂ (7.45 mm). 23.7. Eucosmini genus L sp. D, ♂ (7.50 mm). 23.8. Eucosmini genus M sp. A, ♀ (7.45 mm).

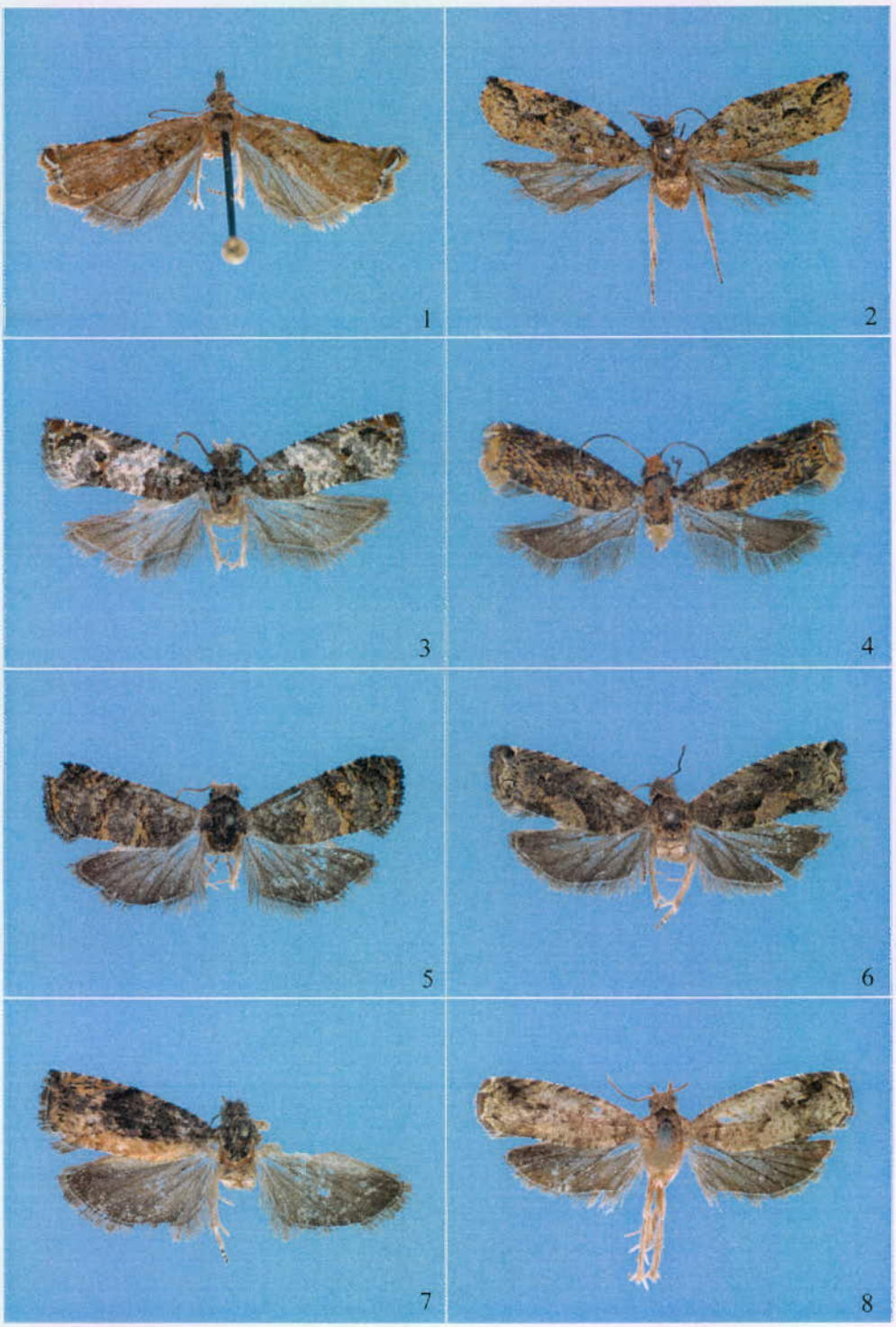


Figure 24 Adults. 24.1. Eucosmini genus O sp. A, ♀ (6.72 mm). 24.2. Eucosmini genus P sp. A, ♀ (4.54 mm). 24.3. Eucosmini genus Q sp. A, ♂ (4.18 mm). 24.4. Euscosmini genus R sp. A, ♀ (3.50 mm). 24.5. Eucosmini genus S sp. A, ♂ (4.09 mm). 24.6. *Acanthoclita balanoptycha* (Meyrick), ♂ (4.90 mm). 24.7. *A. balia* Diakonoff, ♀ (6.20 mm). 24.8. *A.* sp. A, ♂ (4.77 mm).

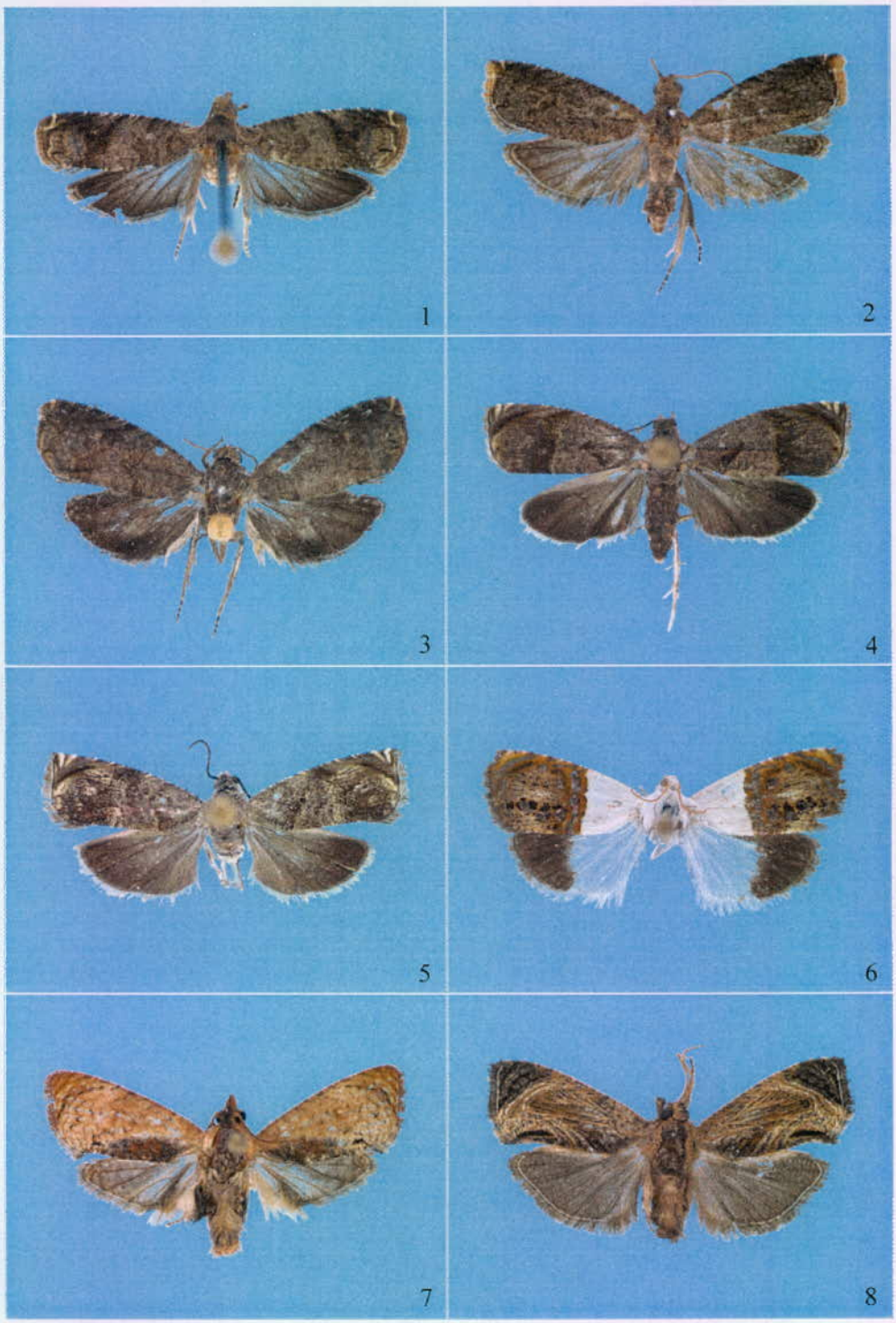


Figure 25 Adults. 25.1. *Acanthoclita* sp. B, ♀ (4.88 mm). 25.2. *A.* sp. C, ♂ (4.67 mm). 25.3. *A.* sp. D, ♂ (4.68 mm). 25.4. *Andrioplecta shoreae* Komai, ♂ (5.77 mm). 25.5. *A. subpulverula* (Obraztsov), ♂ (5.68 mm). 25.6. *Cimeliomorpha cymbalora* (Meyrick), ♀ (6.81 mm). 25.7. *Cryptophlebia ombrodelta* (Lower), ♂ (8.56 mm). 25.8. *C. repletana* (Walker), ♂ (8.79 mm).

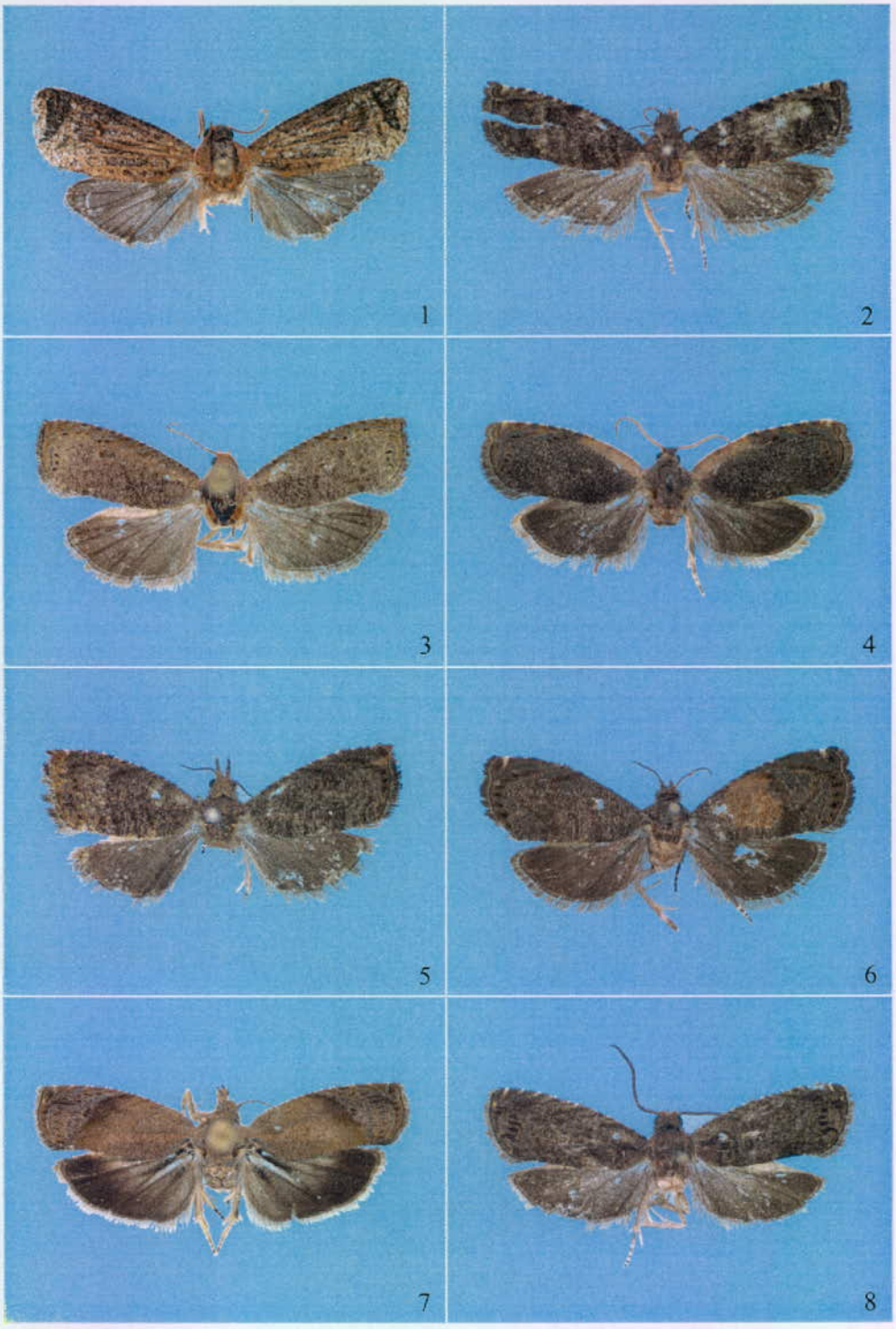


Figure 26 Adults. 26.1. *Cryptophlebia rhynchias* (Meyrick), ♂ (11.06 mm). 26.2. *Cydia celiae* (Clarke), ♀ (4.68 mm). 26.3. *C. malesana* (Meyrick), ♀ (6.31 mm). 26.4. *C.* sp. A, ♀ (5.59 mm). 26.5. *Dierlia* sp. B, ♀ (3.59 mm). 26.6. *D.* sp. C, ♀ (4.22 mm). 26.7. *Grapholita comanticosta* Kuznetsov, ♂ (6.36 mm). 26.8. *G. dysaethria* Diakonoff, ♂ (4.40 mm).

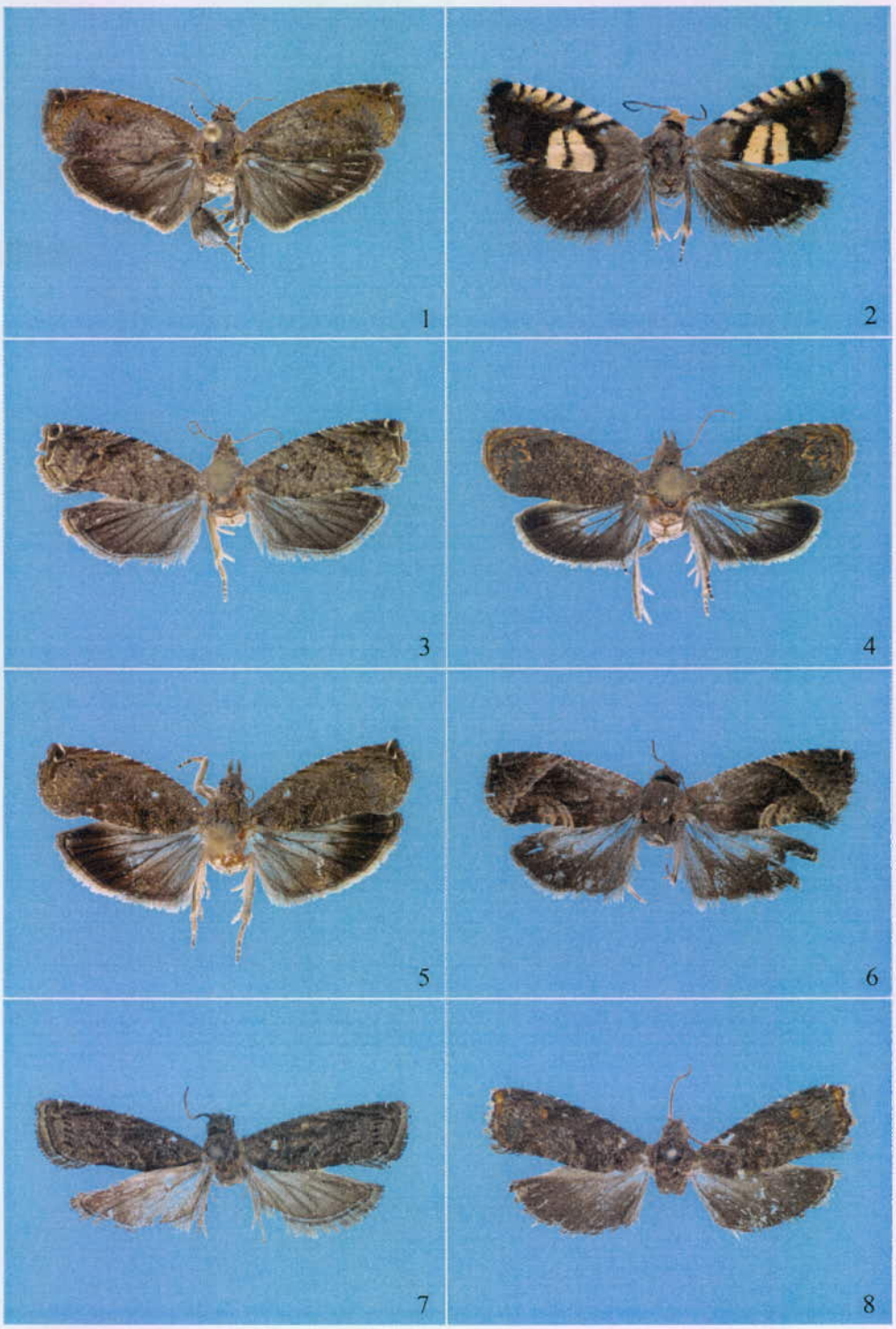


Figure 27 Adults. 27.1. *Grapholita seclusana* (Walker), ♂ (11.40 mm). 27.2. *G.* sp. B, ♂ (3.68 mm). 27.3. *G.* sp. C, ♀ (6.11 mm). 27.4. *G.* sp. D, ♀ (6.09 mm). 27.5. *G.* sp. E, ♂ (6.34 mm). 27.6. *G.* sp. F, ♂ (6.09 mm). 27.7. *Karacaoglania* sp. A, ♂ (4.27 mm). 27.8. *K.* sp. B, ♂ (4.36 mm).

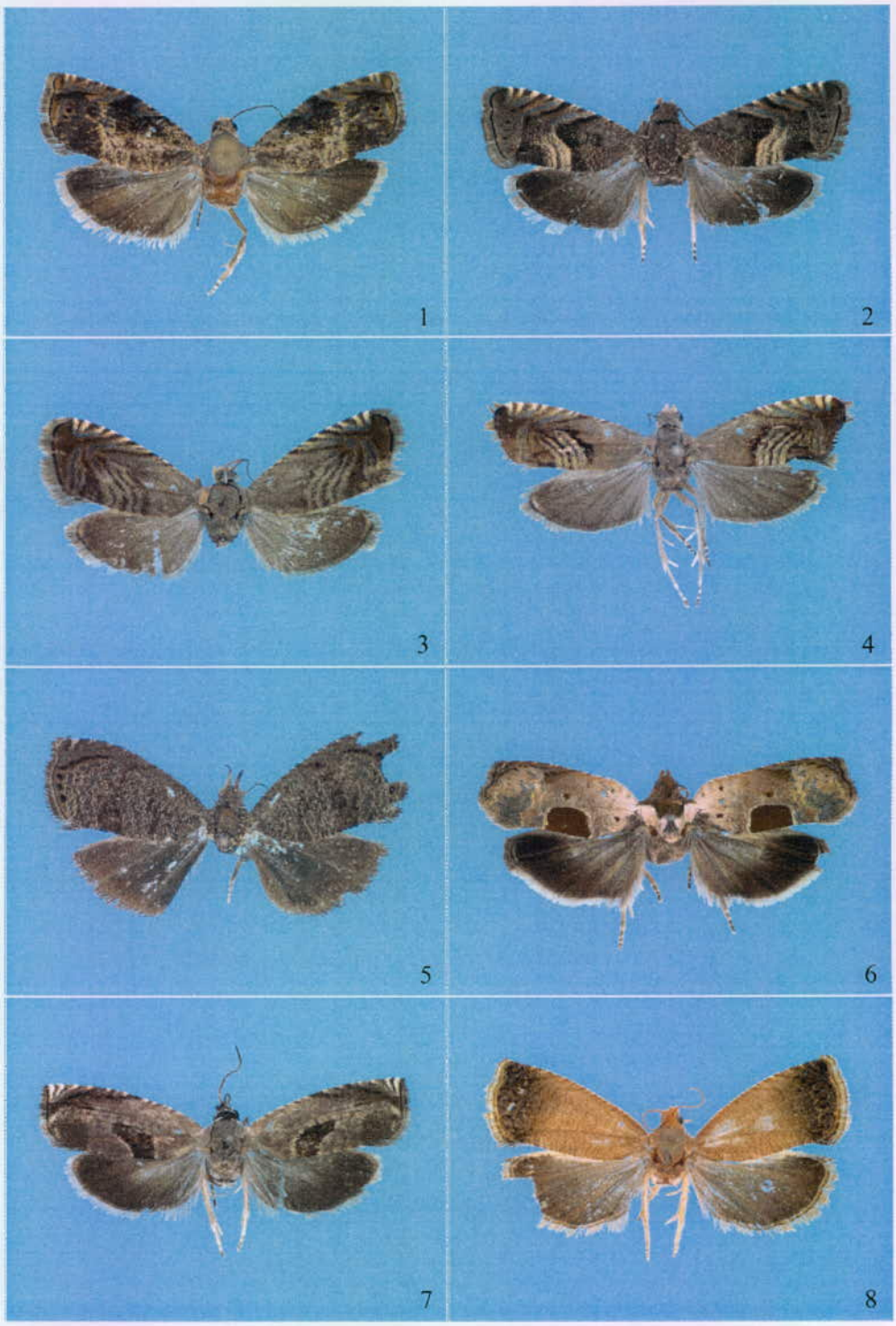


Figure 28 Adults. 28.1. *Leguminivora* sp. A, ♀ (5.63 mm). 28.2. *L.* sp. B, ♀ (4.45 mm) 28.3. *Microsarotis lucida* (Meyrick), ♂ (4.68 mm). 28.4. *M. palamedes* (Meyrick), ♂ (3.97 mm). 28.5. *Pammene* sp. B, ♂ (3.81 mm). 28.6. *P.* sp. C, ♀ (5.24 mm). 28.7. *P.* sp. D, ♀ (5.50 mm). 28.8. *Parapammene* sp. A, ♂ (5.27 mm).

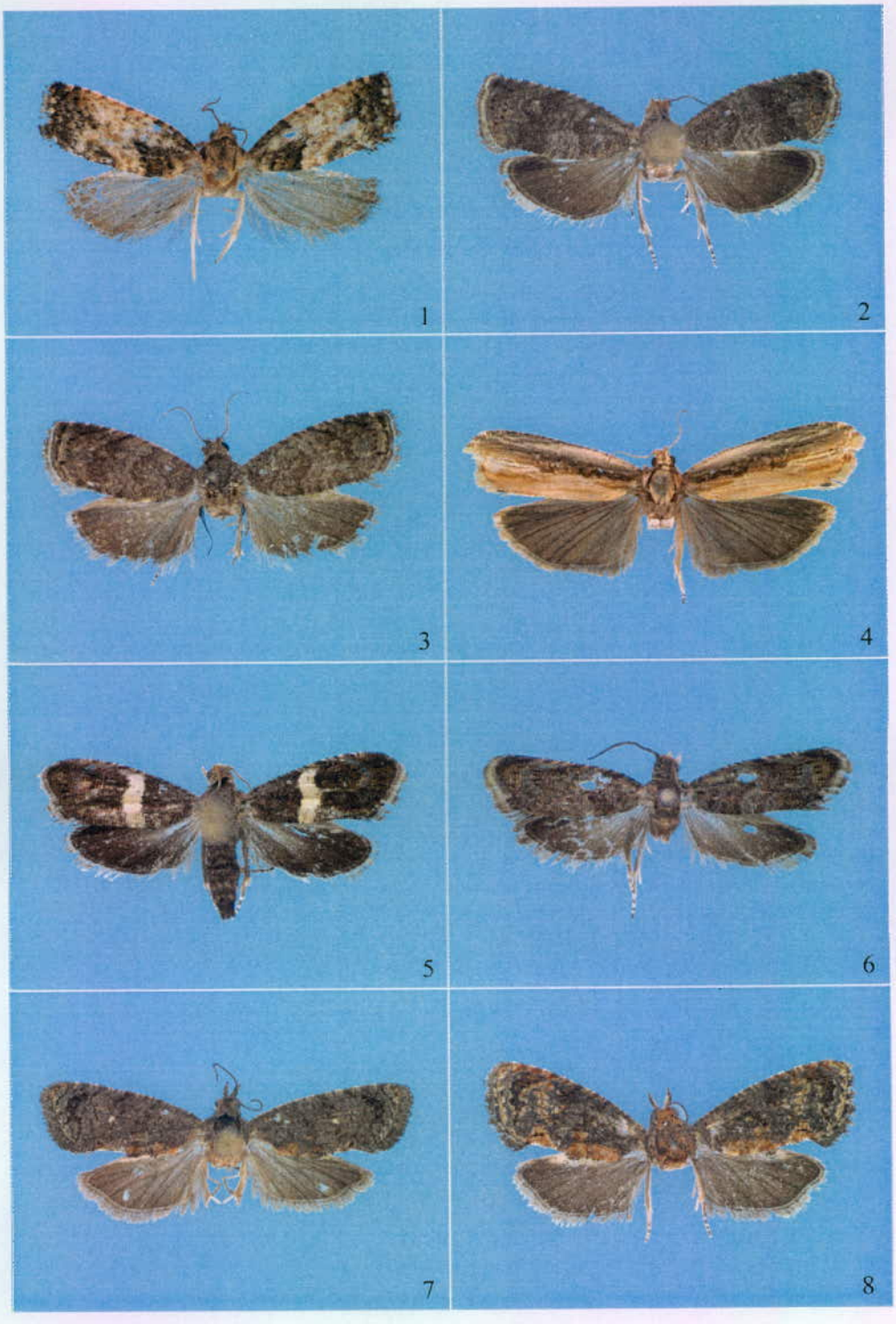


Figure 29 Adults. 29.1. *Parapammene* sp. B, ♂ (4.88 mm). 29.2. *P.* sp. C, ♀ (4.68 mm). 29.3. *P.* sp. E, ♂ (4.45 mm). 29.4. *Procoronis swinhoeiana* (Walsingham), ♀ (15.04 mm). 29.5. *Strophedra* sp. A, ♂ (4.68 mm). 29.6. *S.* sp. B, ♂ (3.36 mm). 29.7. *Thaumatotibia hemitoma* (Diakonoff), ♂ (6.71 mm). 29.8. *T.* sp. A, ♀ (5.74 mm).

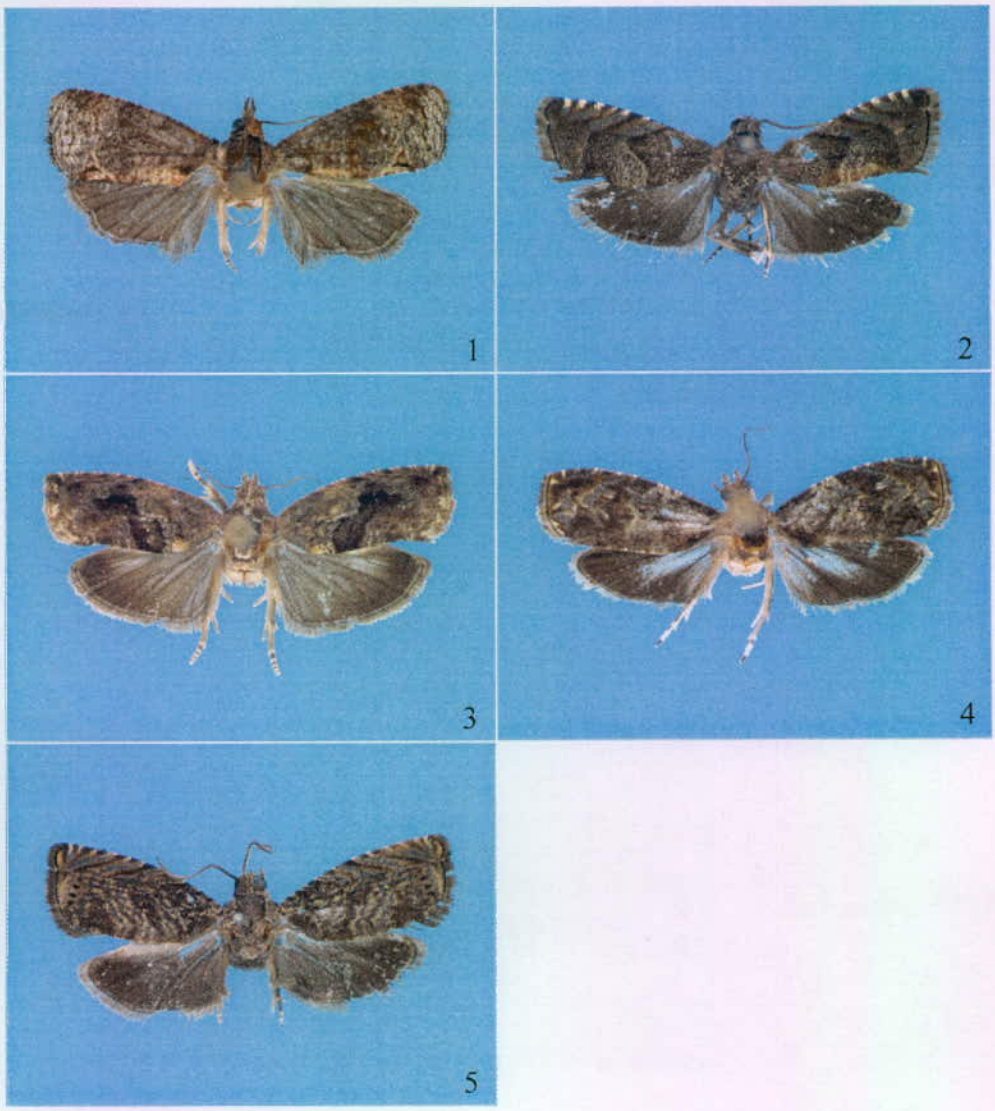


Figure 30 Adults. 30.1. *Thaumatotibia* sp. B, ♀ (8.76 mm). 30.2. Grapholitini genus B sp. A, ♂ (3.91 mm). 30.3. Grapholitini genus C sp. A, ♀ (7.22 mm). 30.4. Grapholitini genus D sp. A, ♀ (5.45 mm). 30.5. Grapholitini genus H sp. A, ♂ (4.77 mm).

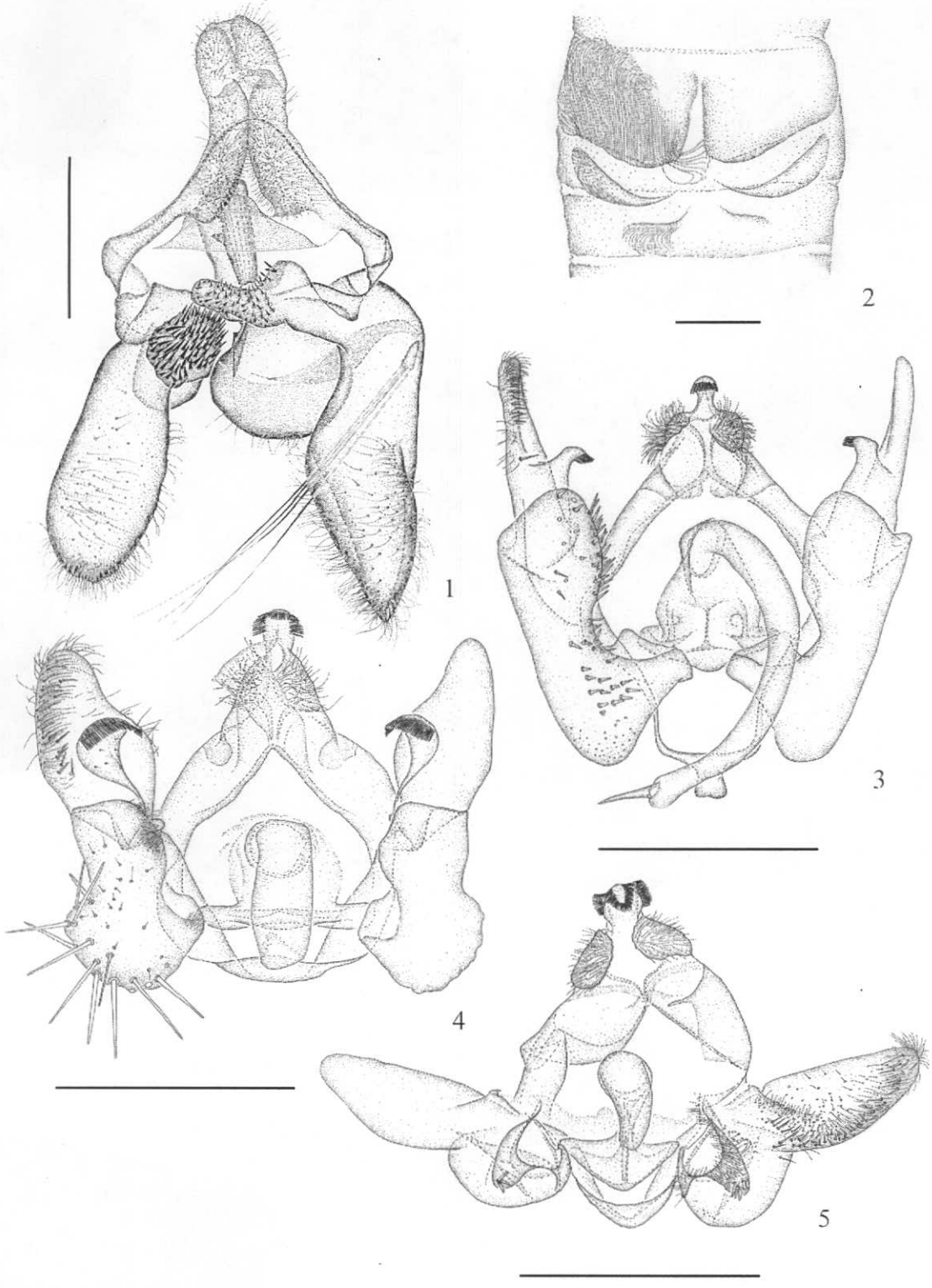


Figure 31 Male genitalia. 31.1. *Gatesclarkeana idia* Diakonoff, NP300. 31.2. *G. idia,* abdomen, NP300. 31.3. *Bactra cerata* (Meyrick) NP397. 31.4. *B. coronata* Diakonoff, NP502. 31.5. *B. honesta* Meyrick, NP496. Scales = 0.5 mm.

Figure 32 Male genitalia. 32.1. *Bactra orbiculi* Diakonoff, NP59. 32.2. *B. venosana* (Zeller), NP334. 32.3. *B.* sp. A, NP492. Scales = 0.5 mm.

Figure 33 Male genitalia. 33.1. *Bubonoxena ephippias* (Meyrick), NP355. 33.2. *B. spirographa* Diakonoff, NP46. 33.3. *Syntozyga pedias* (Meyrick), NP505. Scales = 0.5 mm.

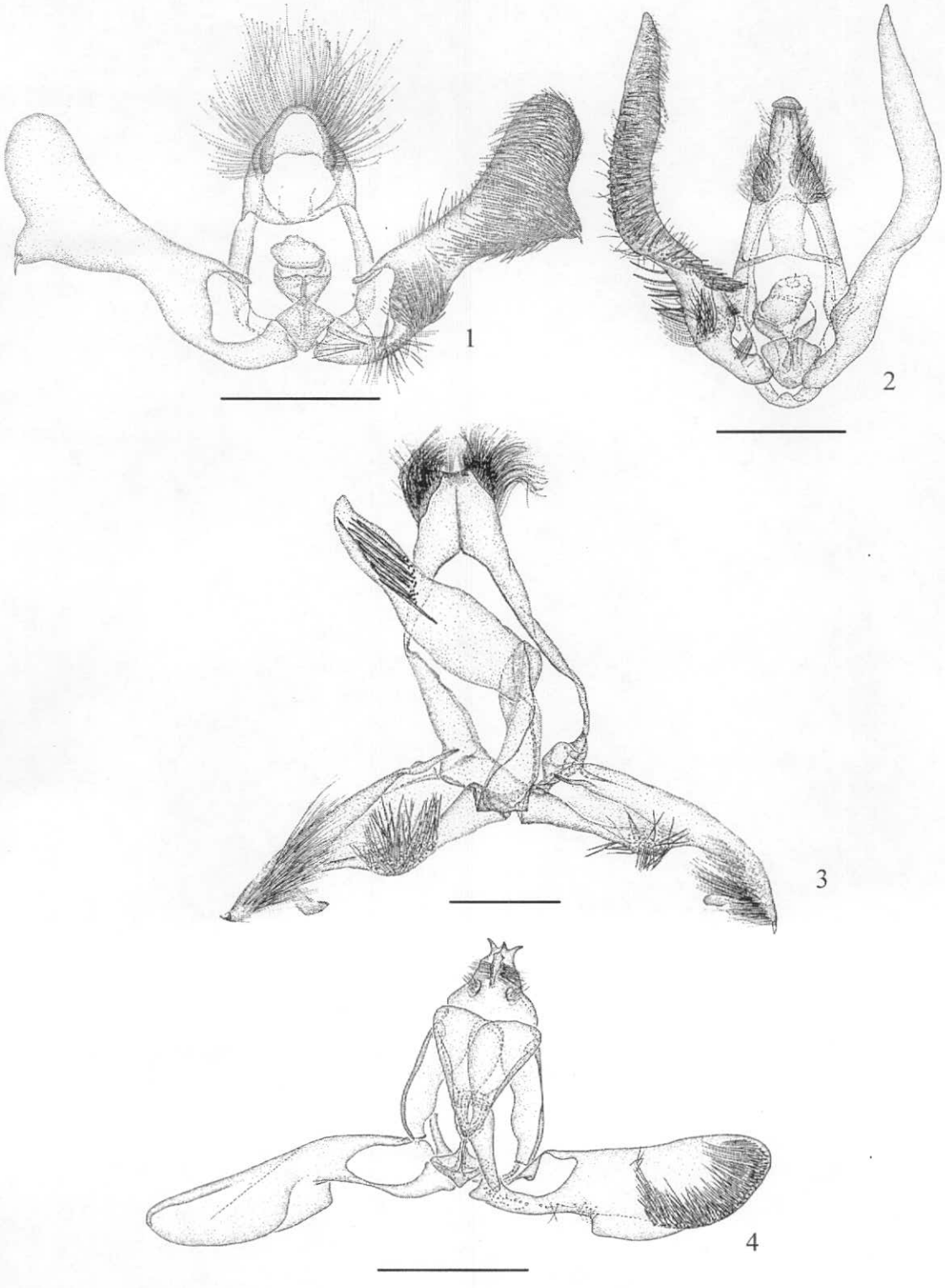


Figure 34 Male genitalia. 34.1. *Arcesis anax* Diakonoff, NP591. 34.2. *Archilobesia* sp. A., NP72. 34.3. *Argyroptocha phalaenopa* Diakonoff, NP184. 34.4. *Balbidomaga* sp. A., NP533. Scales = 0.5 mm.

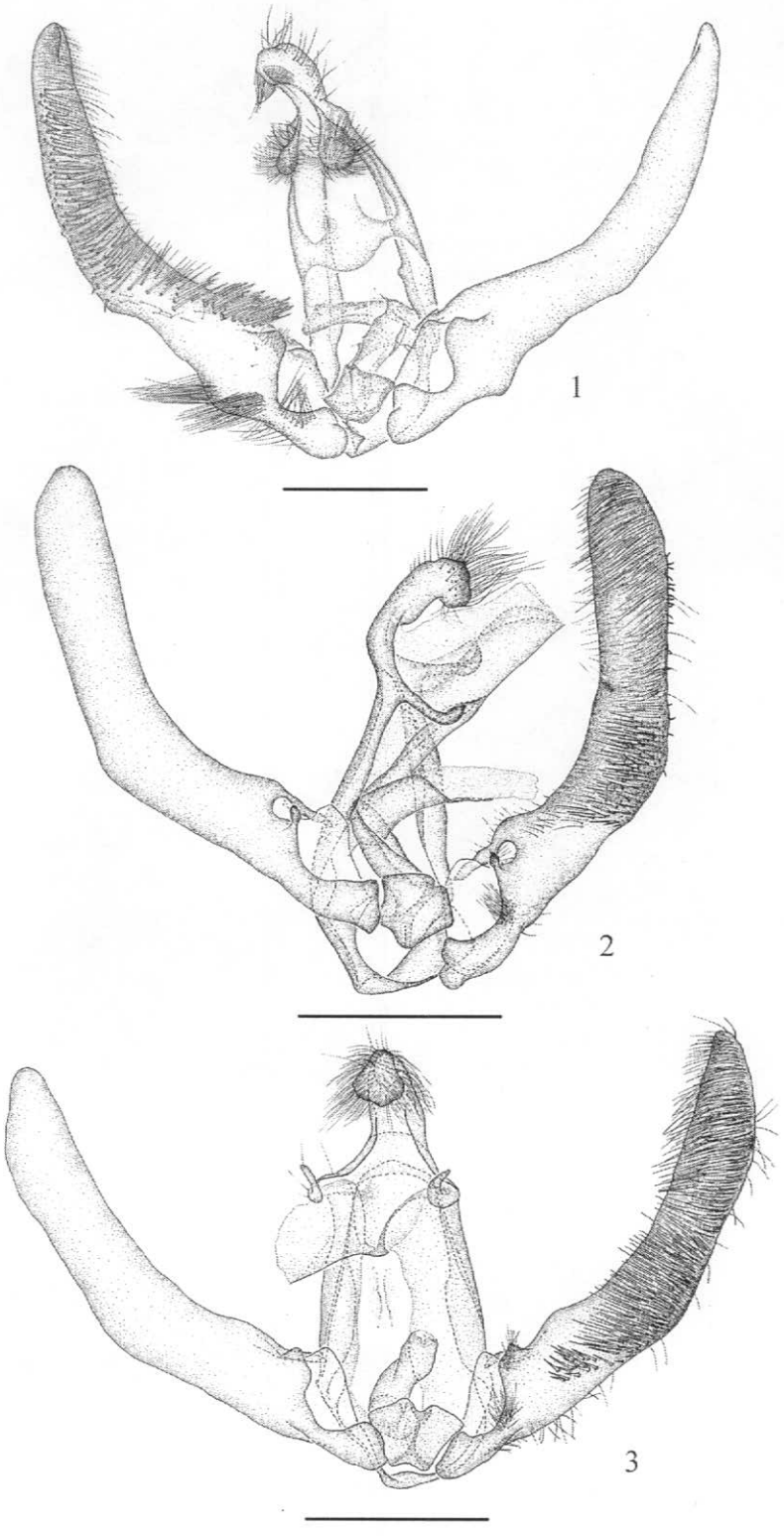


Figure 35 Male genitalia. 35.1. *Cymolomia phaeopelta* (Meyrick), NP565.
35.2. *Dactylioglypha pallens* Diakonoff, NP313.
35.3. *D. tonica* (Meyrick), NP483. Scales = 0.5 mm.

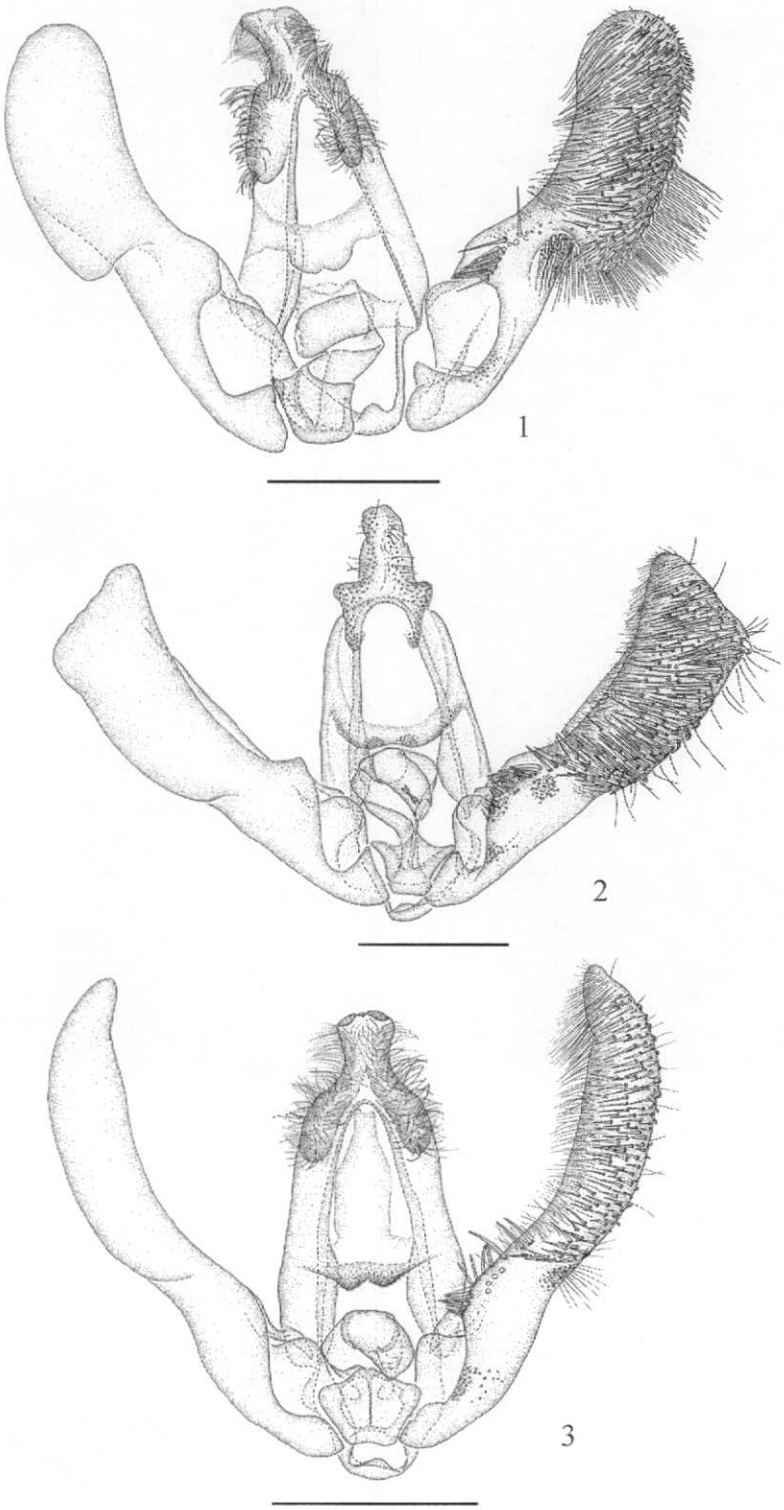


Figure 36 Male genitalia. 36.1. *Dudua aprobola* (Meyrick), NP236. 36.2. *D. brachytoma* Diakonoff, NP158. 36.3. *D. charadraea* (Meyrick), NP365. Scales = 0.5 mm.

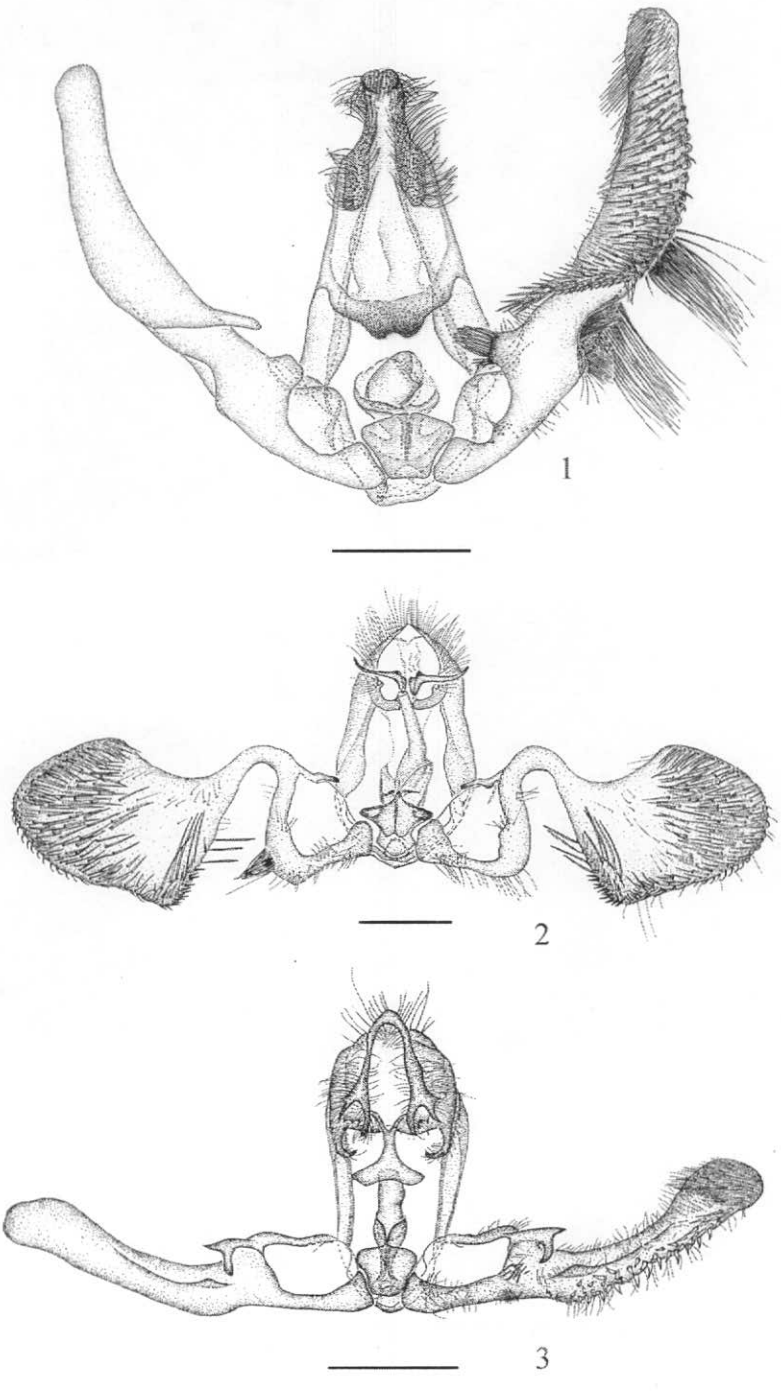


Figure 37 Male genitalia. 37.1. *Dudua tetanota* (Meyrick), NP212. 37.2. *Gnathmocerodes* sp. A, NP77. 37.3. *Hoplitendemis* sp. A, NP388. Scales = 0.5 mm.

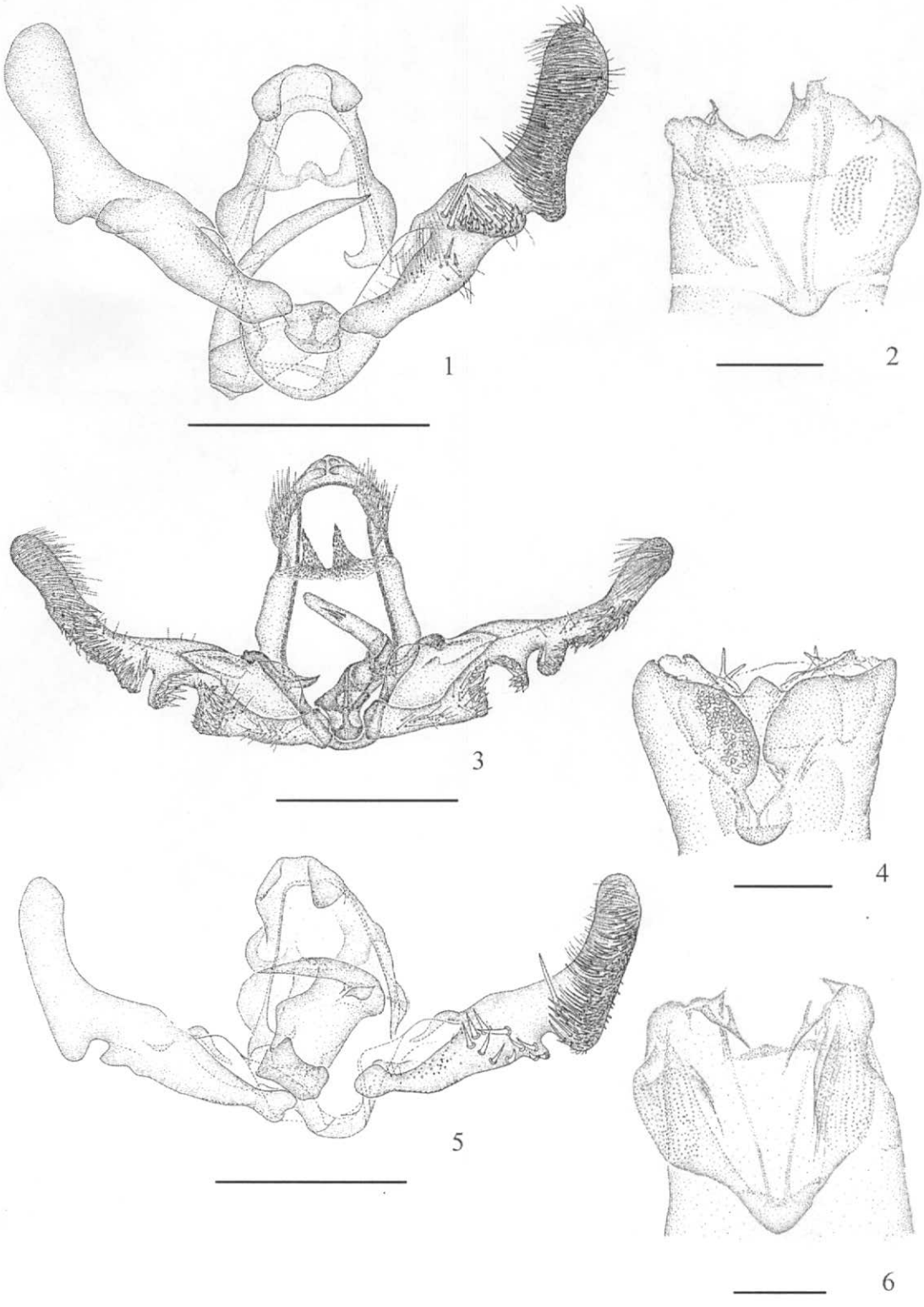


Figure 38 Male genitalia. 38.1. *Lobesia aeolopa* Meyrick, NP295. 38.2. *L. aeolopa,* abdomen, NP295. 38.3. *Lobesia genialis* Meyrick, NP437. 38.4. *L. genialis,* abdomen, NP437. 38.5. *Lobesia lithogonia* Diakonoff, NP380. 38.6. *L. lithogonia,* abdomen, NP380. Scales = 0.5mm.

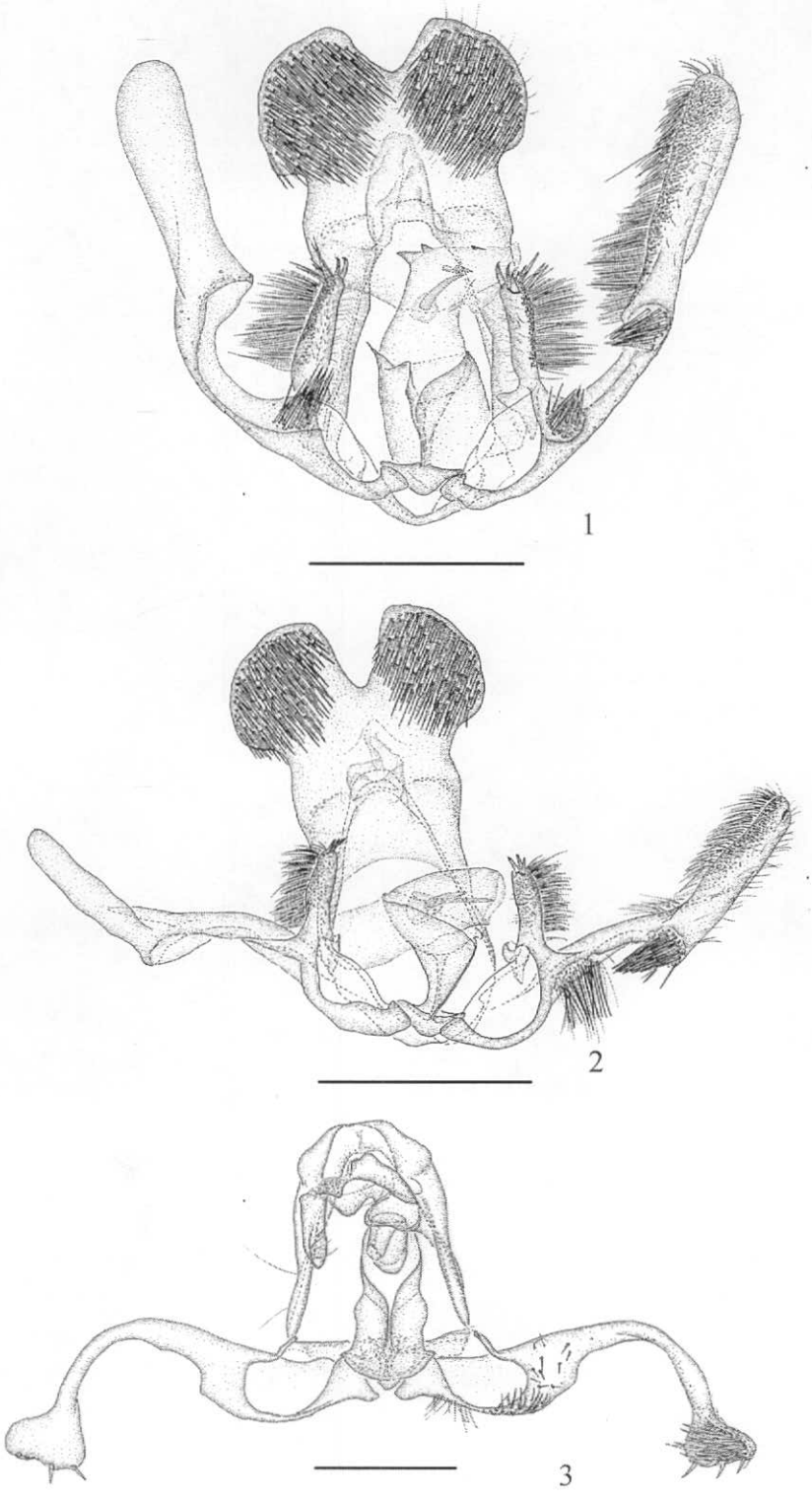


Figure 39 Male genitalia. 39.1. *Megalota fallax* (Meyrick), NP364. 39.2. *M. vera* Diakonoff, NP382. 39.3. *Neohermenias thalassitis* (Meyrick), NP441. Scales = 0.5 mm.

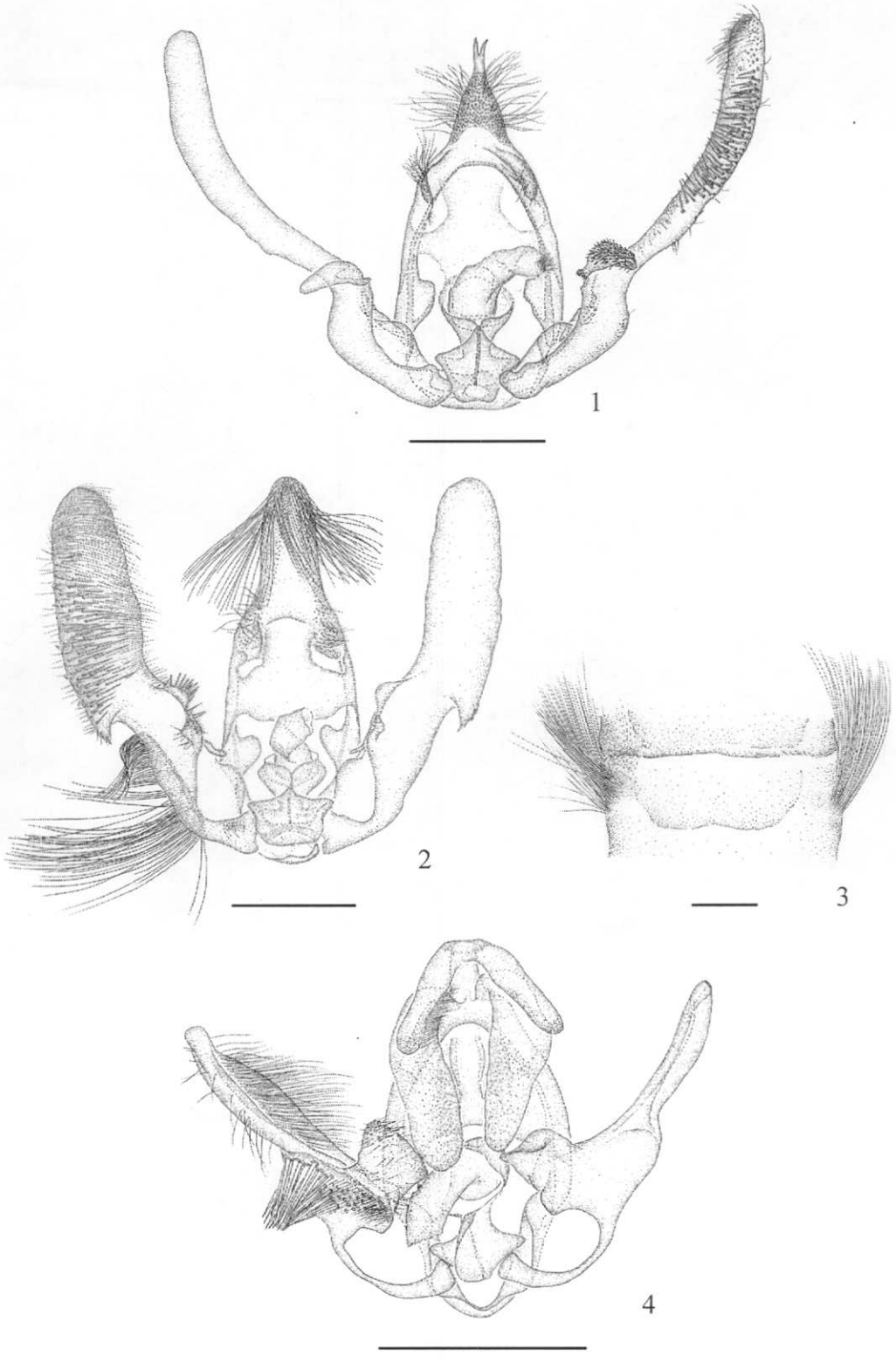


Figure 40 Male genitalia. 40.1. *Neopotamia cathemacta* Diakonoff, NP223. 40.2. *N. formosa* Kawabe, NP581. 40.3. *N. formosa,* abdomen, NP581. 40.4. *N.* sp. A, NP607. Scales = 0.5 mm.

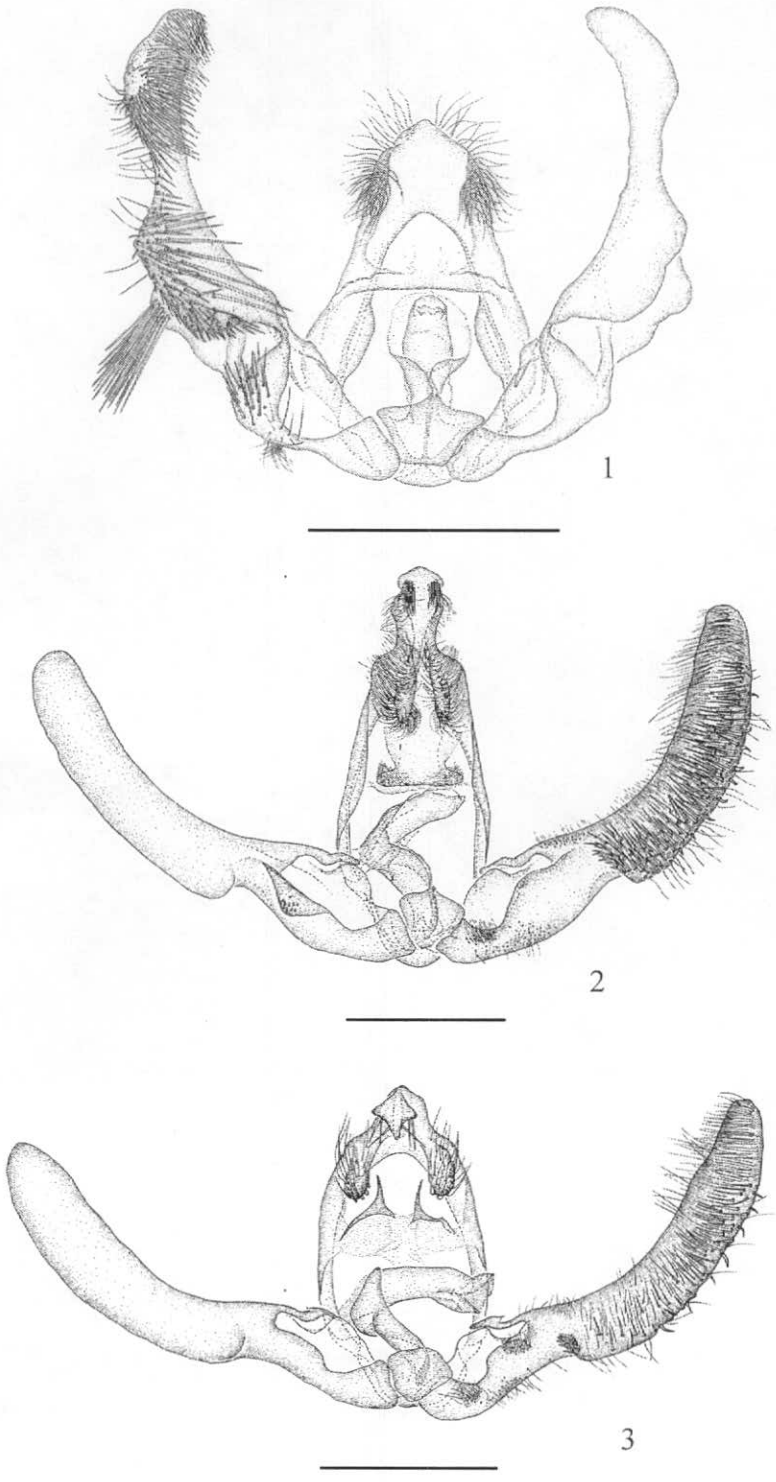


Figure 41 Male genitalia. 41.1. *Olethreutes* sp. A, NP554. 41.2. *Ophiorrhabda mormopa* (Meyrick), NP277. 41.3. *O. philocompsa* (Meyrick), NP288. Scales = 0.5 mm.

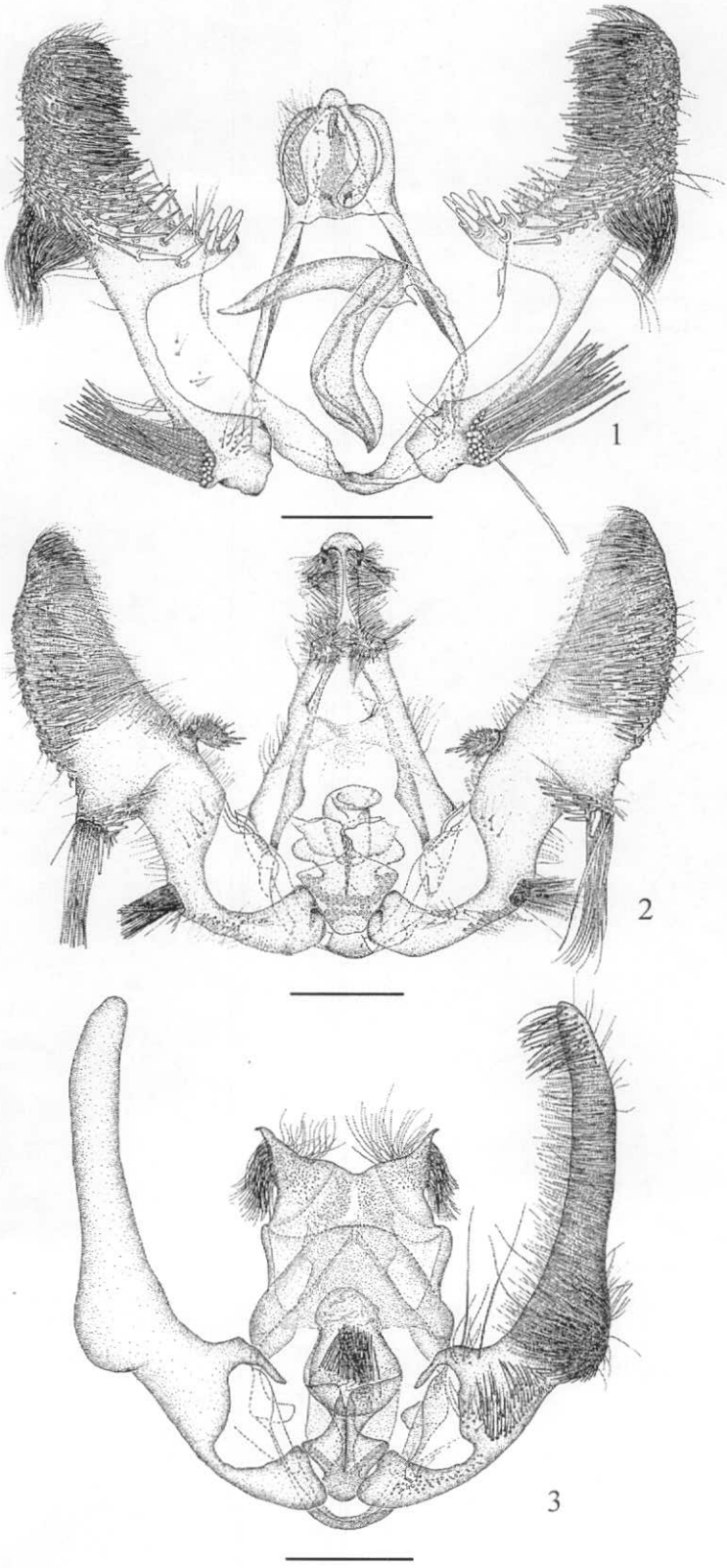


Figure 42 Male genitalia. 42.1. *Penthostola albomaculatis* (Liu & Bai), NP218.
42.2. *Phaecadophora fimbriata* Walsingham, NP402.
42.3. *Phaecasiophora walsinghami* Diakonoff, NP477.
Scales = 0.5 mm.

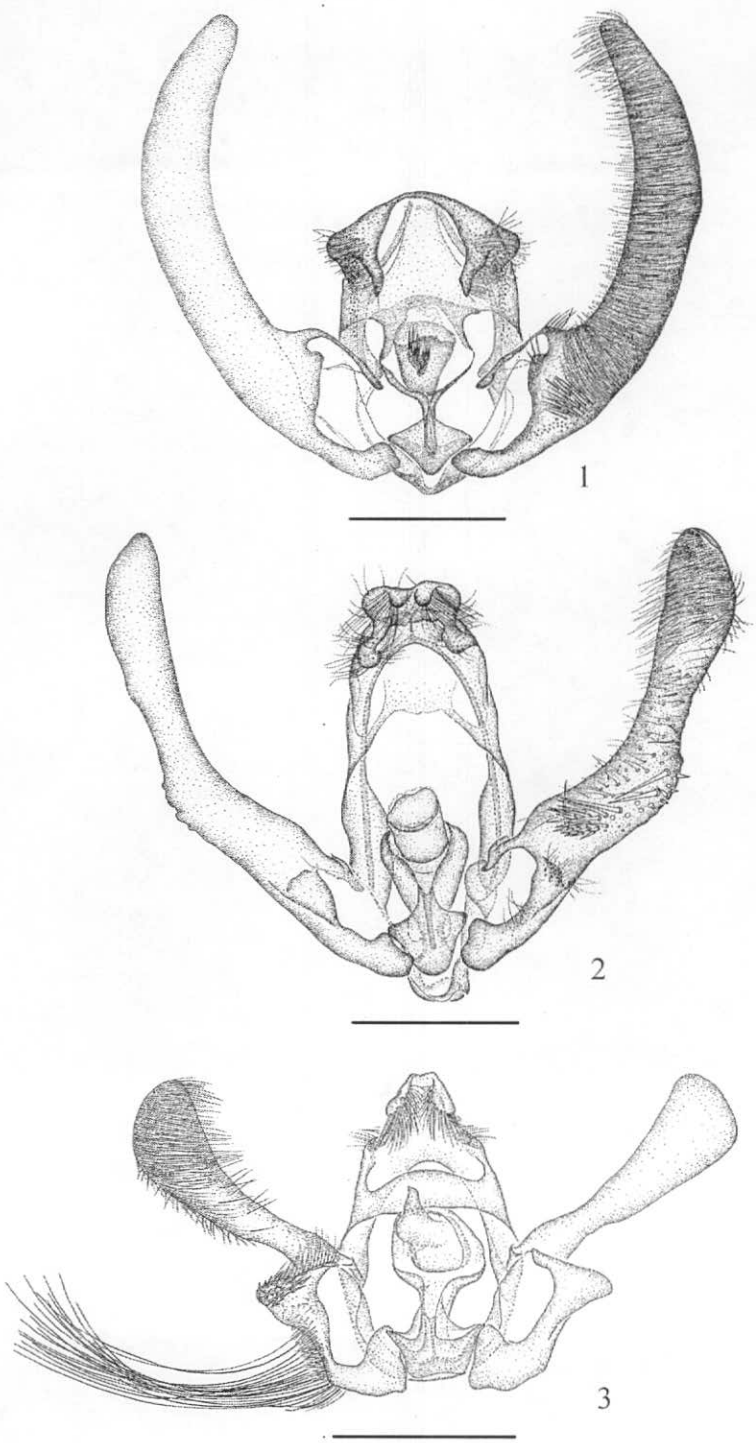


Figure 43 Male genitalia. 43.1. *Phaecasiophora* sp. A, NP122.
43.2. *Phaulacantha metamelas* Diakonoff, NP222.
43.3. *Rhodacra parvusa* Kawabe, NP586. Scales = 0.5 mm.

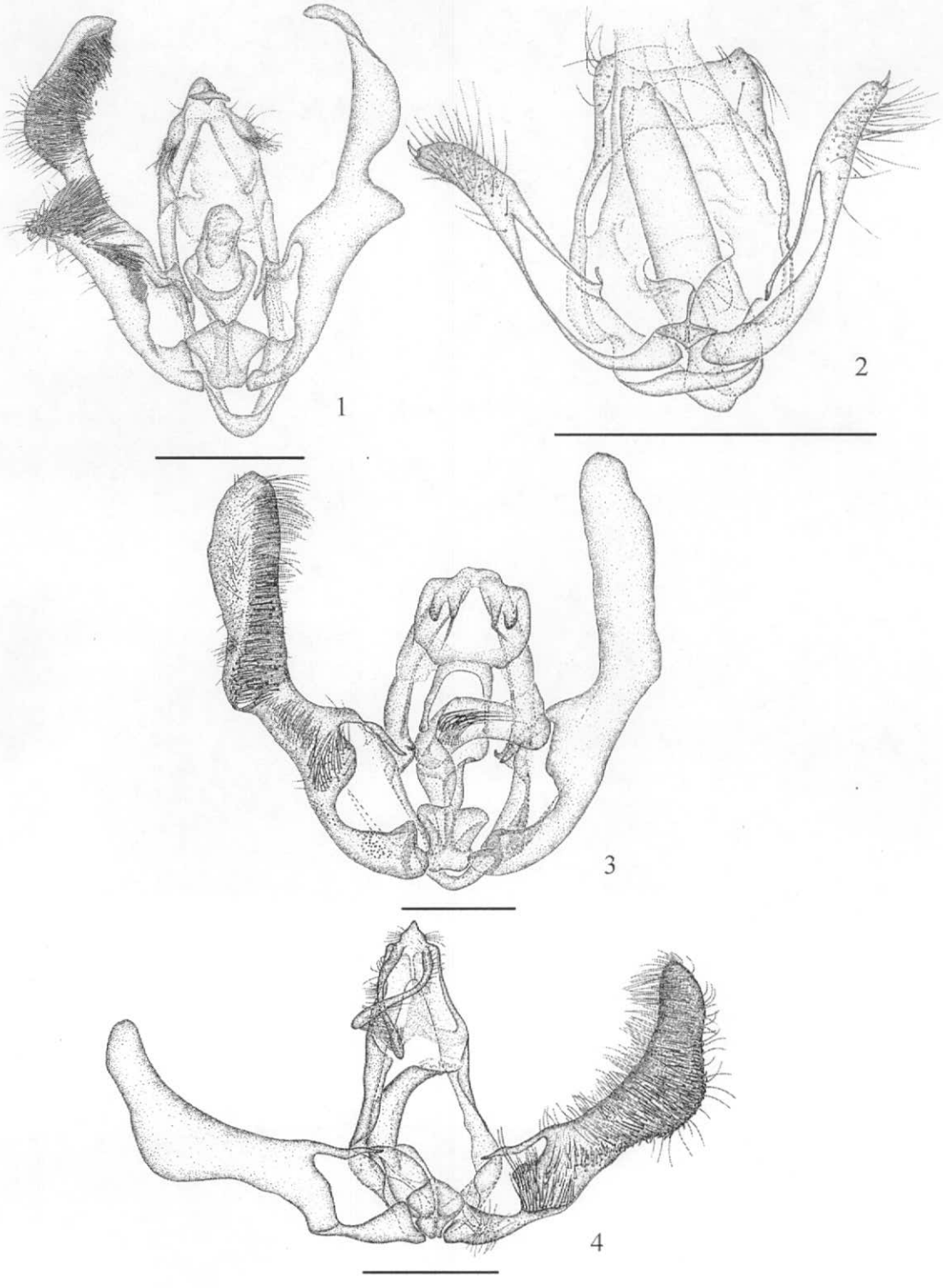


Figure 44 Male genitalia. 44.1. *Rhodacra pyrrhocrossa,* (Meyrick), NP38. 44.2. *Simutophila saccharopa* Tuck, NP350. 44.3. *Sisona albitibiana* Snellen, NP323. 44.4. *Sorolopha archimedias* (Meyrick), NP440. Scales = 0.5 mm.

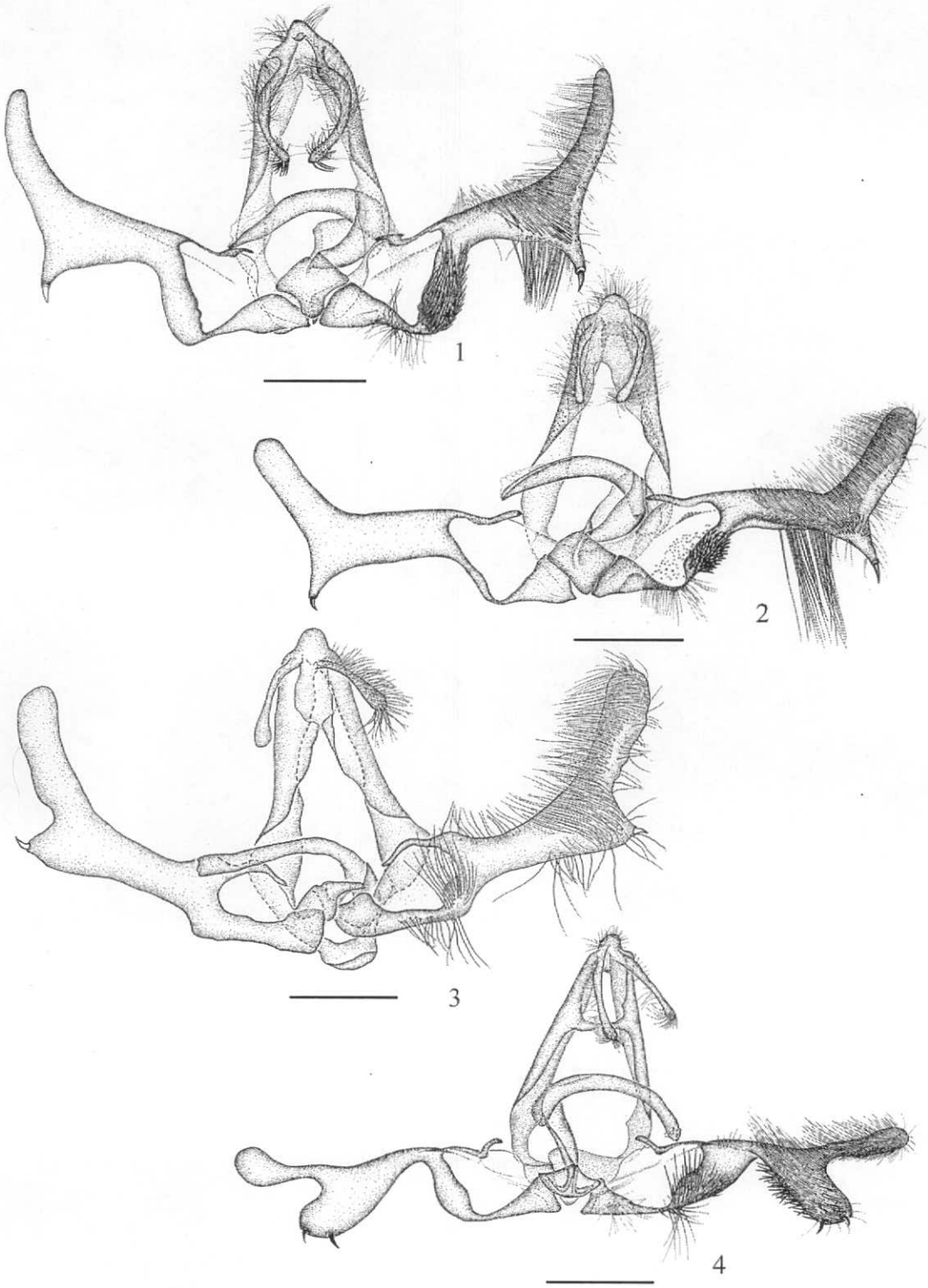


Figure 45 Male genitalia. 45.1. *Sorolopha herbifera* (Meyrick), NP211. 45.2. *S. plinthograpta* (Meyrick), NP385. 45.3. *S. semiculta* (Meyrick), NP756. 45.4. *S. sphaerocopa* (Meyrick), NP373. Scales = 0.5 mm.

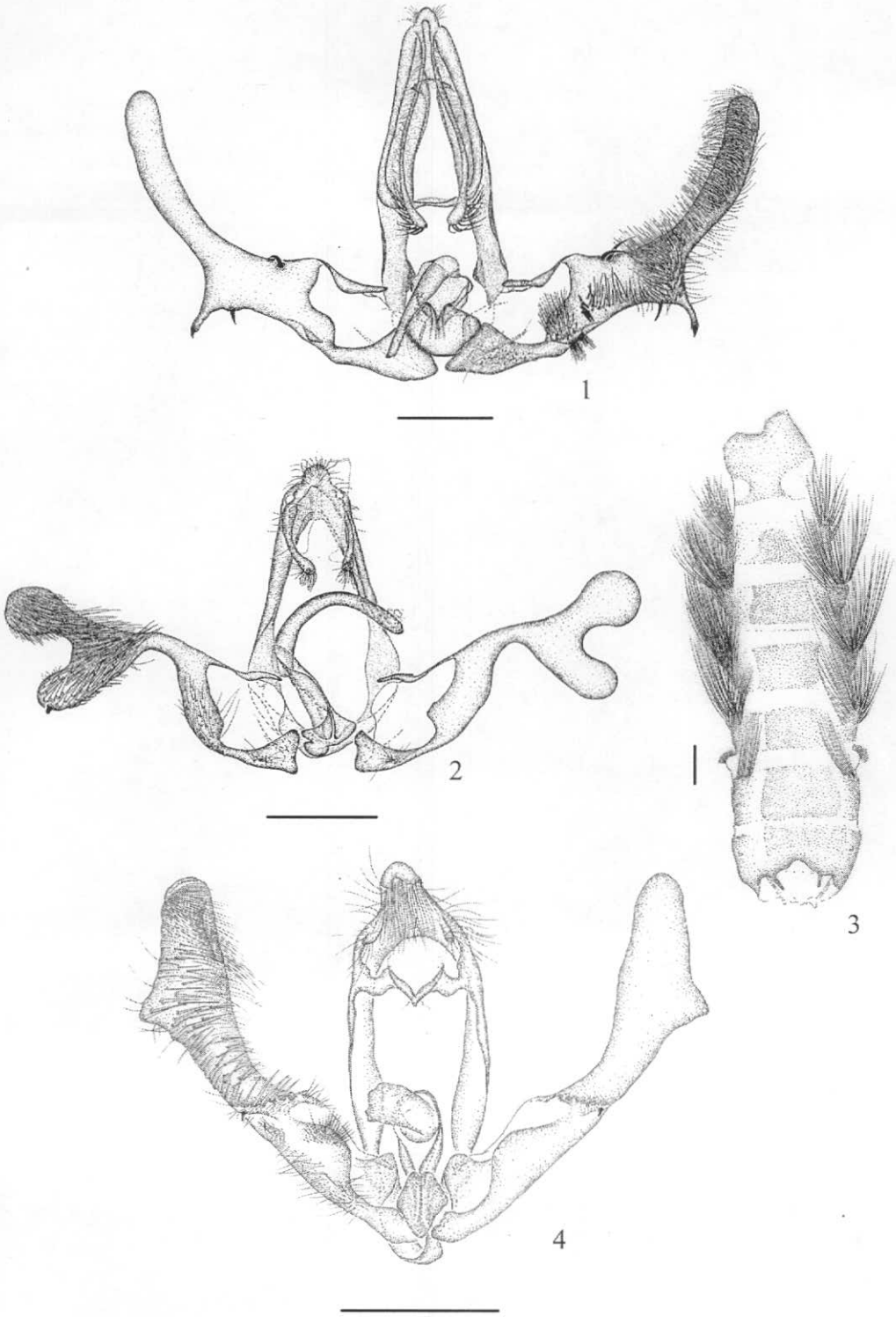


Figure 46 Male genitalia. 46.1. *Sorolopha stygiaula* (Meyrick), NP369. 46.2. *S.* sp. A, NP514. 46.3. *S.* sp. A, abdomen, NP514. 46.4. *Statherotis discana (*Felder & Rogenhofer), NP674. Scales = 0.5 mm.

Figure 47 Male genitalia. 47.1. *Statherotis* sp. C, NP194. 47.2. *S.* sp. D, NP117. 47.3. *Statherotoxys* sp. A, NP746. 47.4. *Sycacantha* sp. A, NP746. Scales = 0.5 mm.

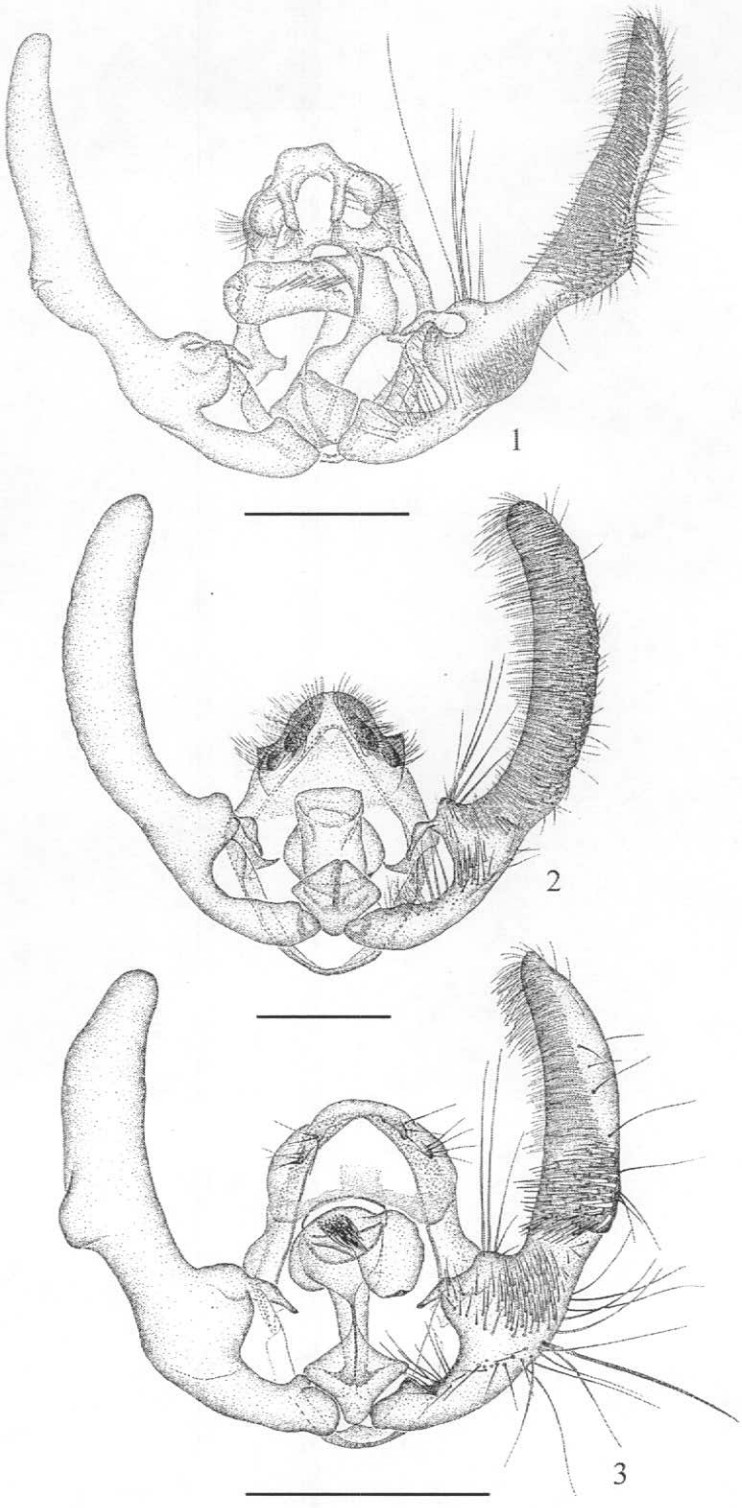


Figure 48 Male genitalia. 48.1. *Sycacantha* sp. B, NP746. 48.2. *S.* sp. C, NP389. 48.3. *S.* sp. D, NP414. Scales = 0.5 mm.

Figure 49 Male genitalia. 49.1. *Sycacantha* sp. E, NP588. 49.2. *Teleta talaris* (Durrant), NP106. 49.3. *Temnolopha matura* Diakonoff, NP325. 49.4. *Thysanocrepis crossota* (Meyrick), NP444. Scales = 0.5 mm.

Figure 50 Male genitalia. 50.1. Olethreutini genus B sp. A, NP518. 50.2. Olethreutini genus C sp. A, NP394. 50.3. *Anathamna spermatophaga* Diakonoff & Bradley, NP585. 50.4. *A.* sp. A, NP390. 50.5. *A.* sp. B, NP631. Scales = 0.5 mm.

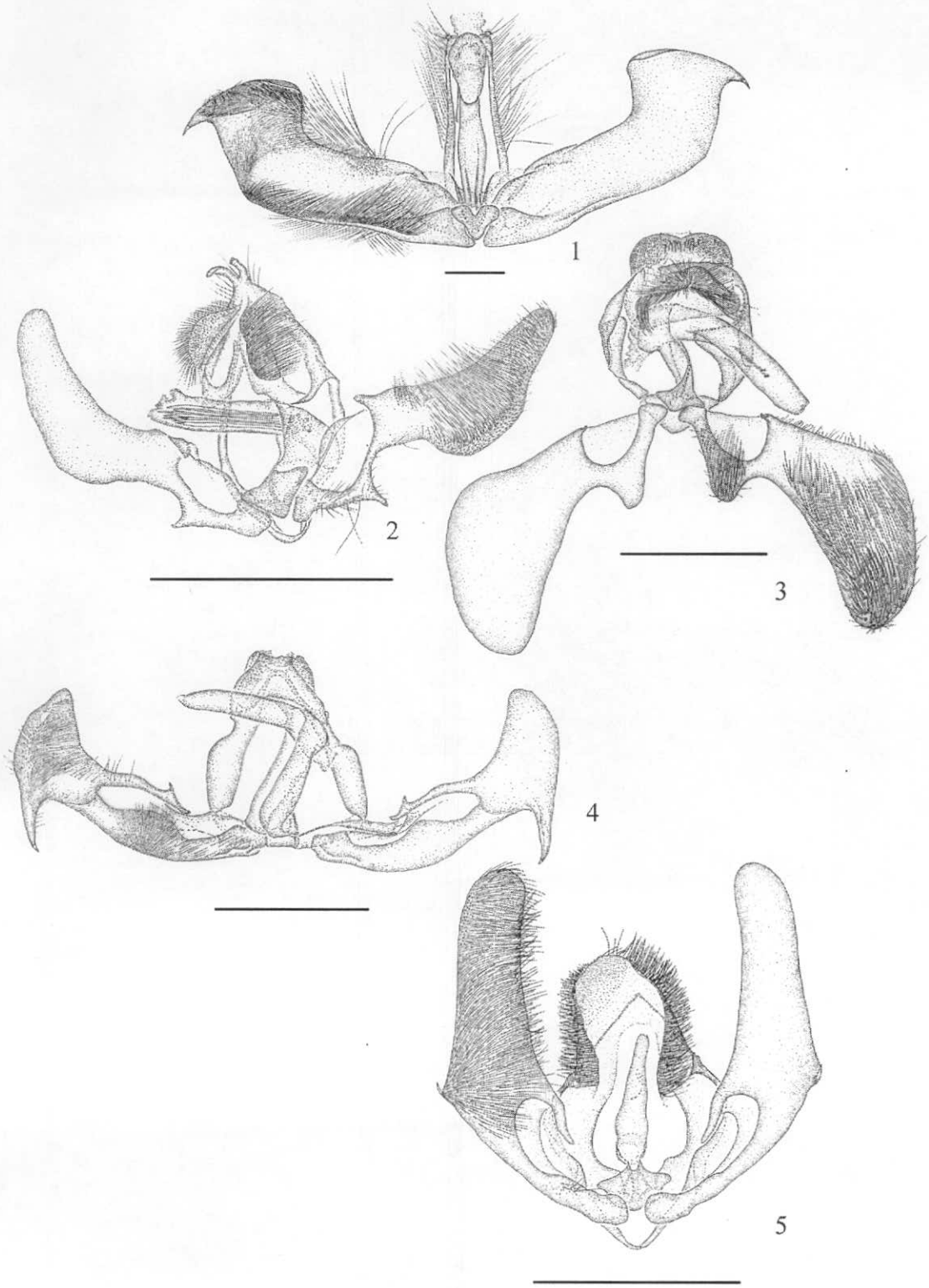


Figure 51 Male genitalia. 51.1. *Ancylis anthophanes* Meyrick, NP677. 51.2. *A. celerata* (Meyrick), NP660. 51.3. *A. lutescens* Meyrick, NP342. 51.4. *Loboschiza koenigiana* (Fabricius), NP754. 51.5. *L.* sp. A, NP443. Scales = 0.5 mm.

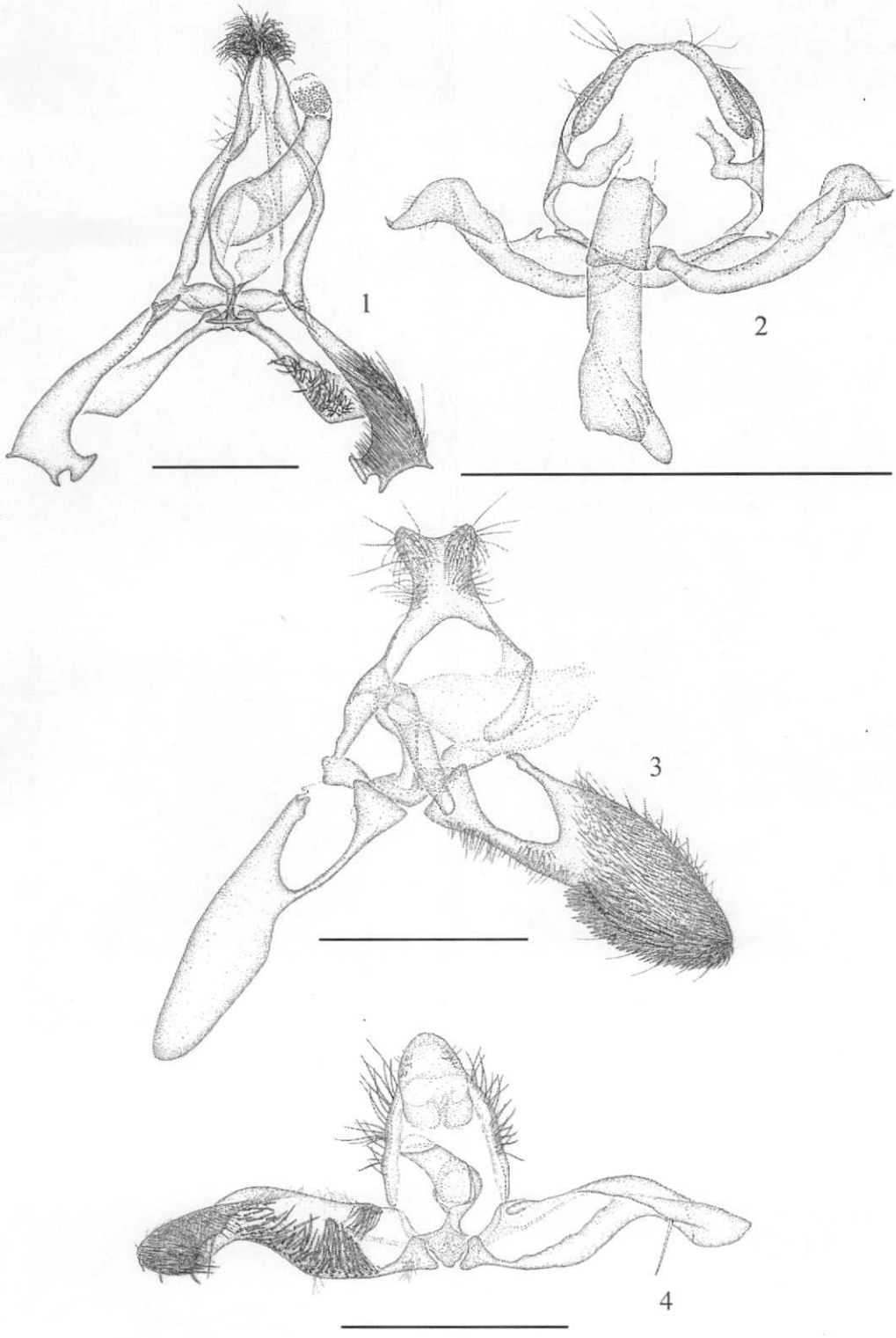


Figure 52 Male genitalia. 52.1. *Tetramoera flavescens* Kuznetsov, NP379. 52.2. Enarmoniini genus A sp. A, NP685. 52.3. Enarmoniini genus B, sp. A, NP417. 52.4. Enarmoniini genus D sp. A, NP447. Scales = 0.5 mm.

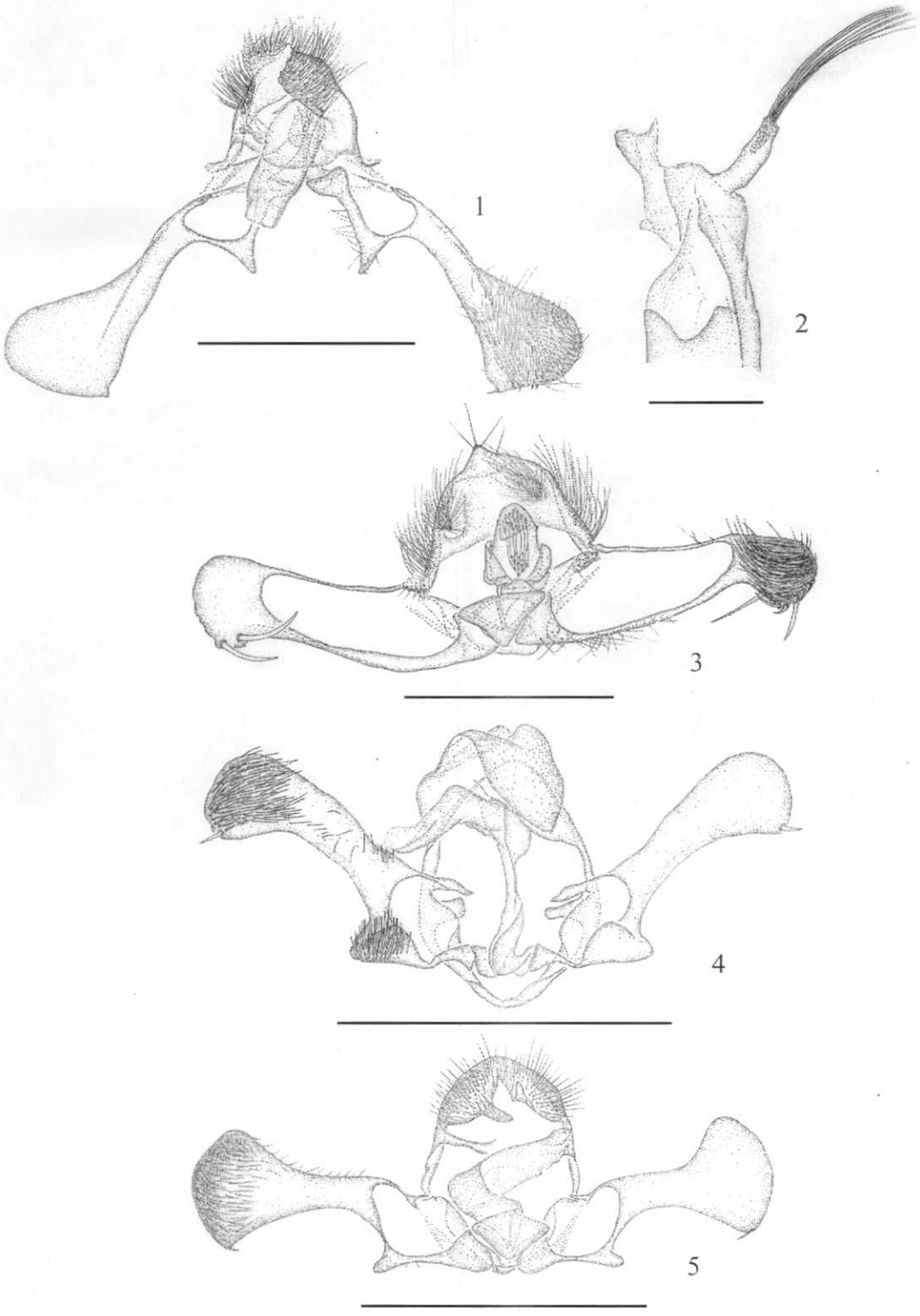


Figure 53 Male genitalia. 53.1. Enarmoniini genus E sp. A, NP541. 53.2. Enarmoniini genus E sp. A, abdomen, NP541. 53.3. Enarmoniini genus F sp. A, NP403. 53.4. Enarmoniini genus G sp. A, NP600. 53.5. Enarmoniini genus H sp. A, NP640. Scales = 0.5 mm.

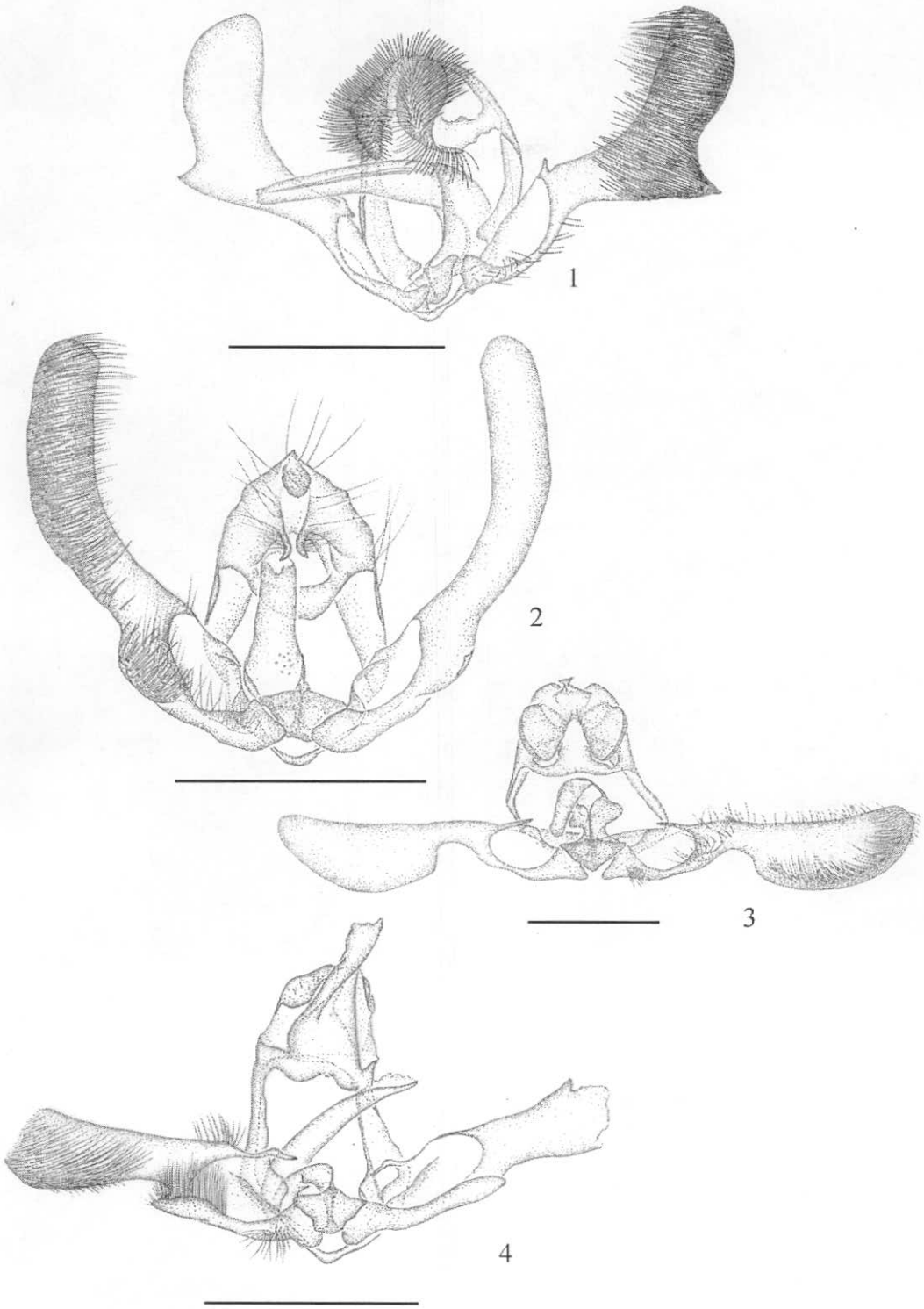


Figure 54 Male genitalia. 54.1. Enarmoniini genus I sp. A, NP636. 54.2. Enarmoniini genus K sp. A, NP661. 54.3. Enarmoniini genus M sp. A, NP715. 54.4. *Acroclita cheradota* Meyrick, NP448. Scales = 0.5 mm.

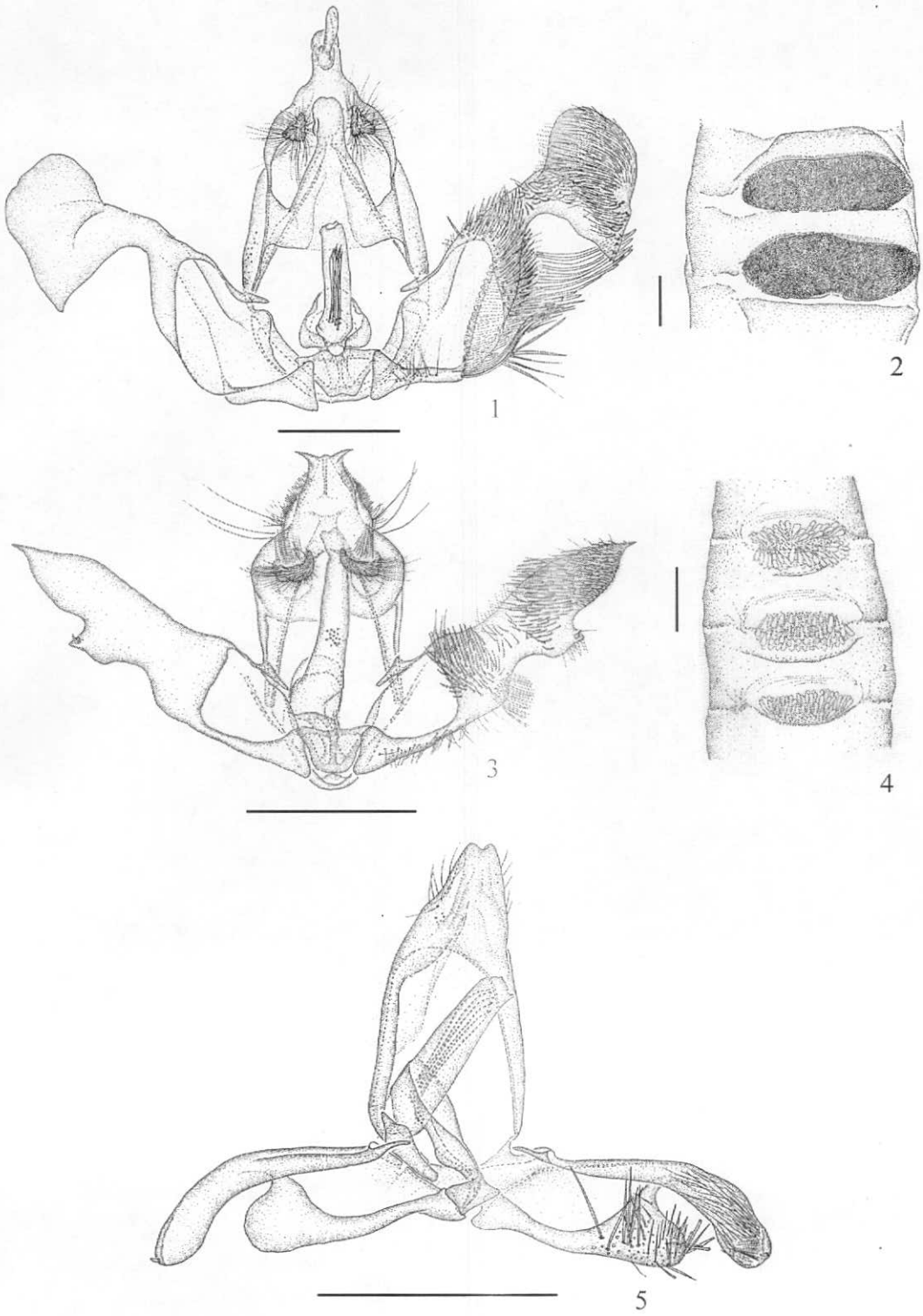


Figure 55 Male genitalia. 55.1. *Acroclita macrosaris* (Meyrick), NP467. 55.2. *A. macrosaris,* abdomen, NP467. 55.3. *A. nigrovenana* Kuznetsov, NP506. 55.4. *A. nigrovenana*, abdomen, NP506. 55.5. *Aemulatrix aequilibra* Diakonoff, NP56. Scales = 0.5 mm.

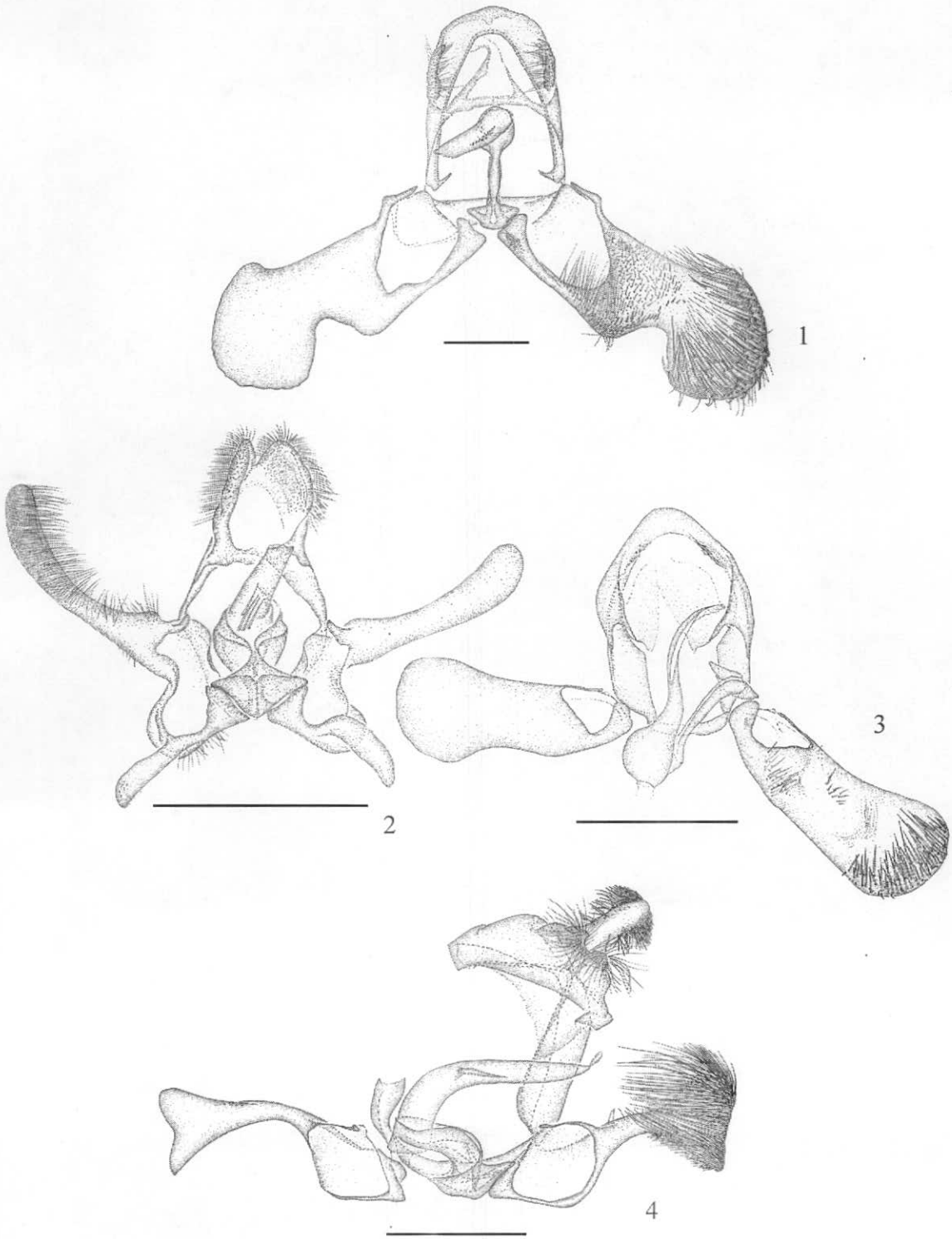


Figure 56 Male genitalia. 56.1. *Assulella archaea* Diakonoff, NP127. 56.2. *Bipartivalva aquilana* Kutnetsov, NP666. 56.3. *Coniostola* sp. A, NP359. 56.4. *Emrahia hoplista* (Meyrick), NP268. Scales = 0.5 mm.

Figure 57 Male genitalia. 57.1. *Epinotia canthonias* (Meyrick), NP358. 57.2. *Eucoenogenes bicuculla* Pinkaew, NP391. 57.3. *E. cyanopsis* (Meyrick), NP121. 57.4. *E. munda* (Diakonoff), NP172. Scales = 0.5 mm.

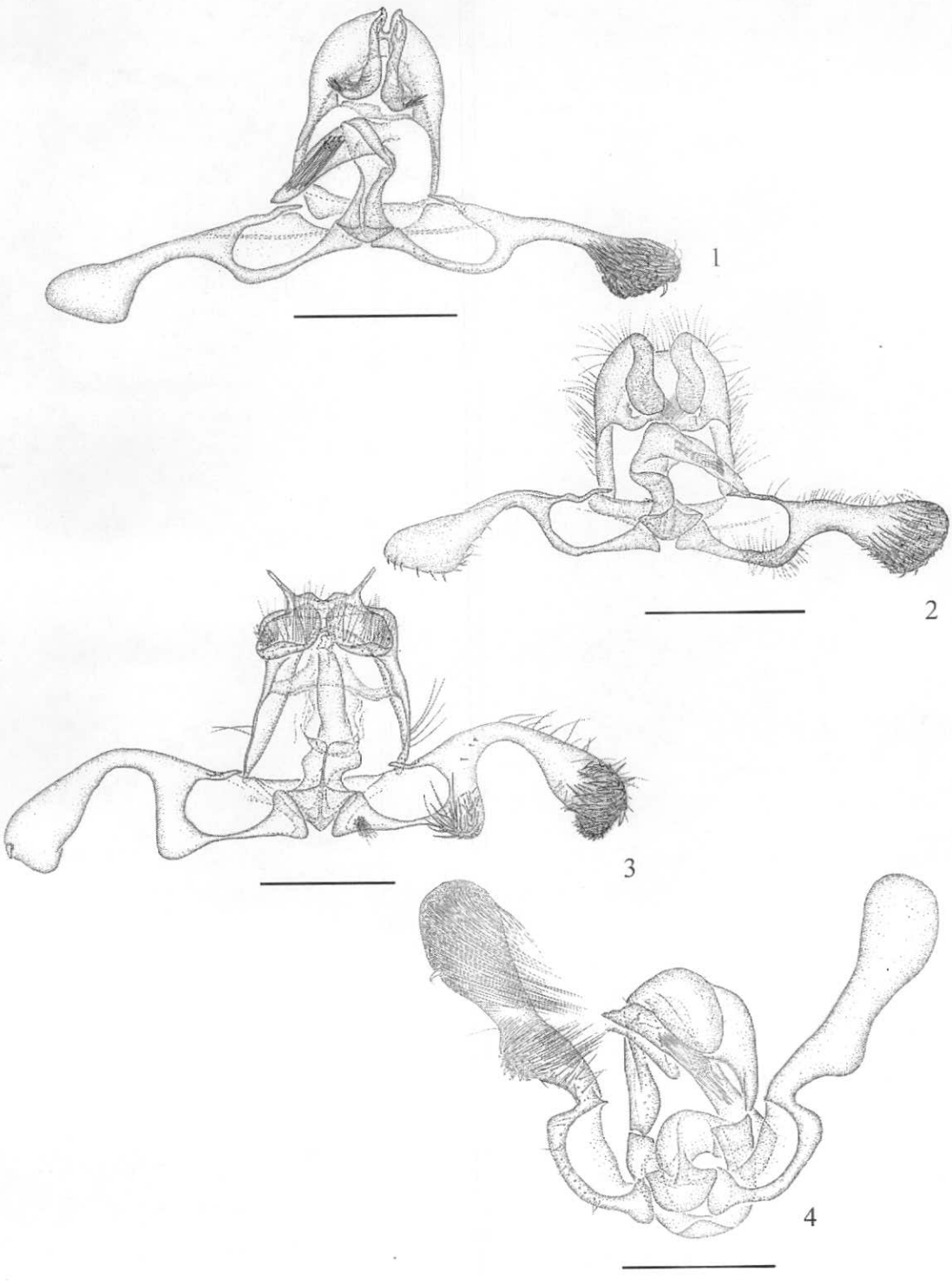


Figure 60 Male genitalia. 60.1. *Heleanna physalodes* (Meyrick), NP257. 60.2. *H.* sp. A, NP504. 60.3. *Hermenias pachnitis* Meyrick, NP443. 60.4. *Herpystis mica* Kuznetsov, NP730. Scales = 0.5 mm.

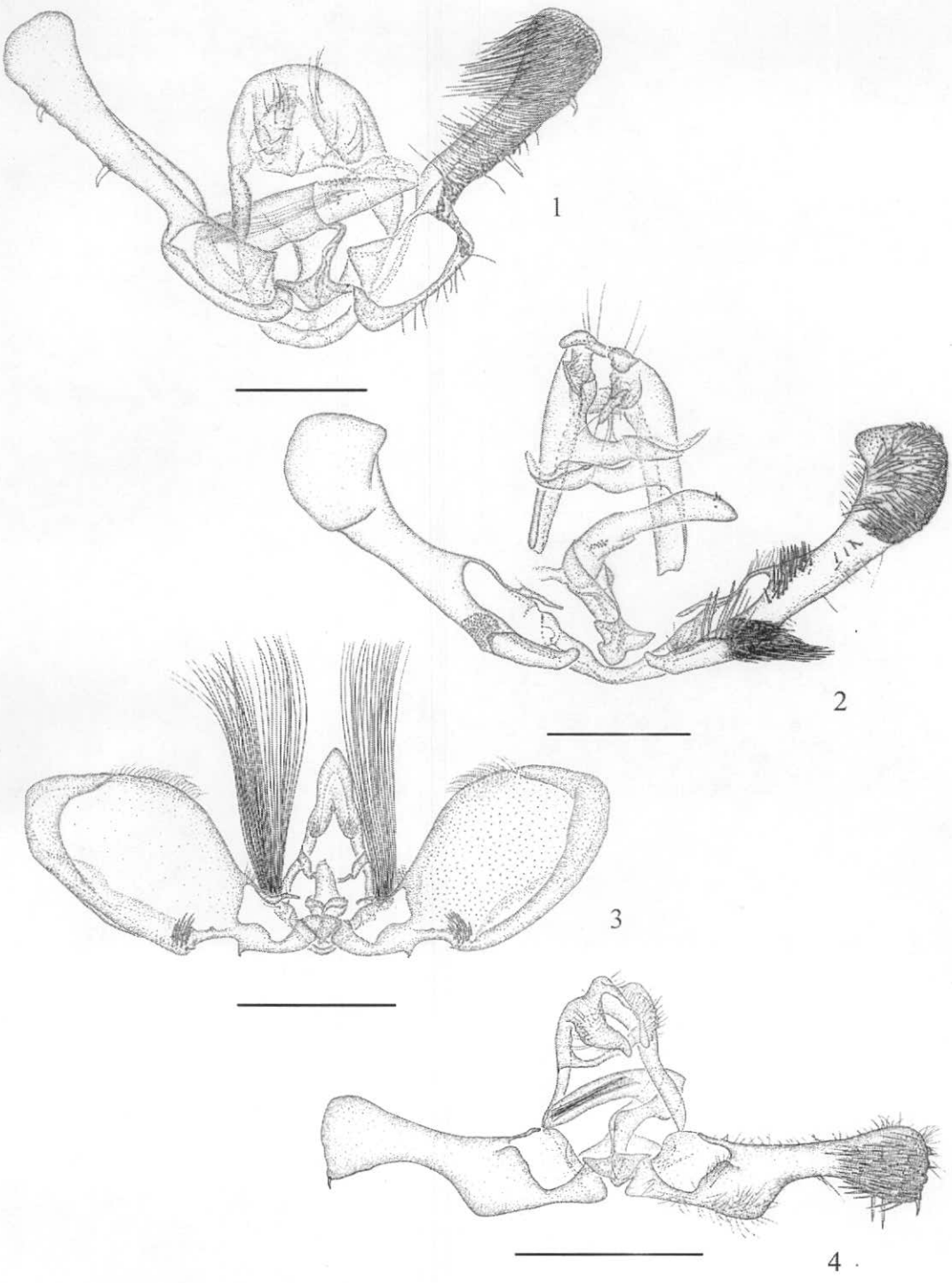


Figure 61 Male genitalia. 61.1. *Herpystis*. sp. C, NP509. 61.2. *Megaherpystis melanoneura* Meyrick, NP501. 61.3. *Noduliferola niphada* (Diakonoff), NP679. 61.4. *Pelochrista pollinaria* Diakonoff, NP727. Scales = 0.5 mm.

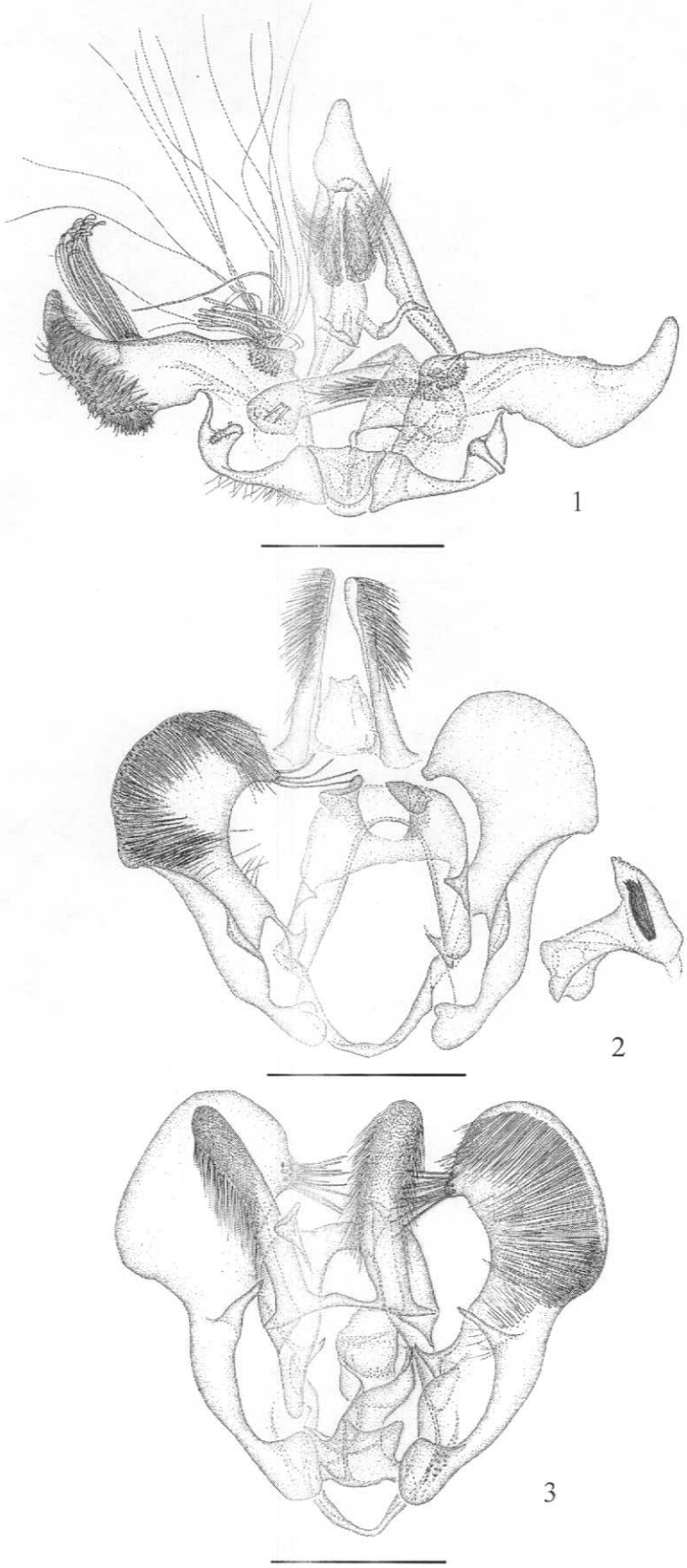


Figure 62 Male genitalia. 62.1. *Rhopobota antecellana* Kuznetsov, NP430. 62.2. *R. symbolias* (Meyrick), NP88. 62.3. *R.* sp. A. Scales = 0.5 mm.

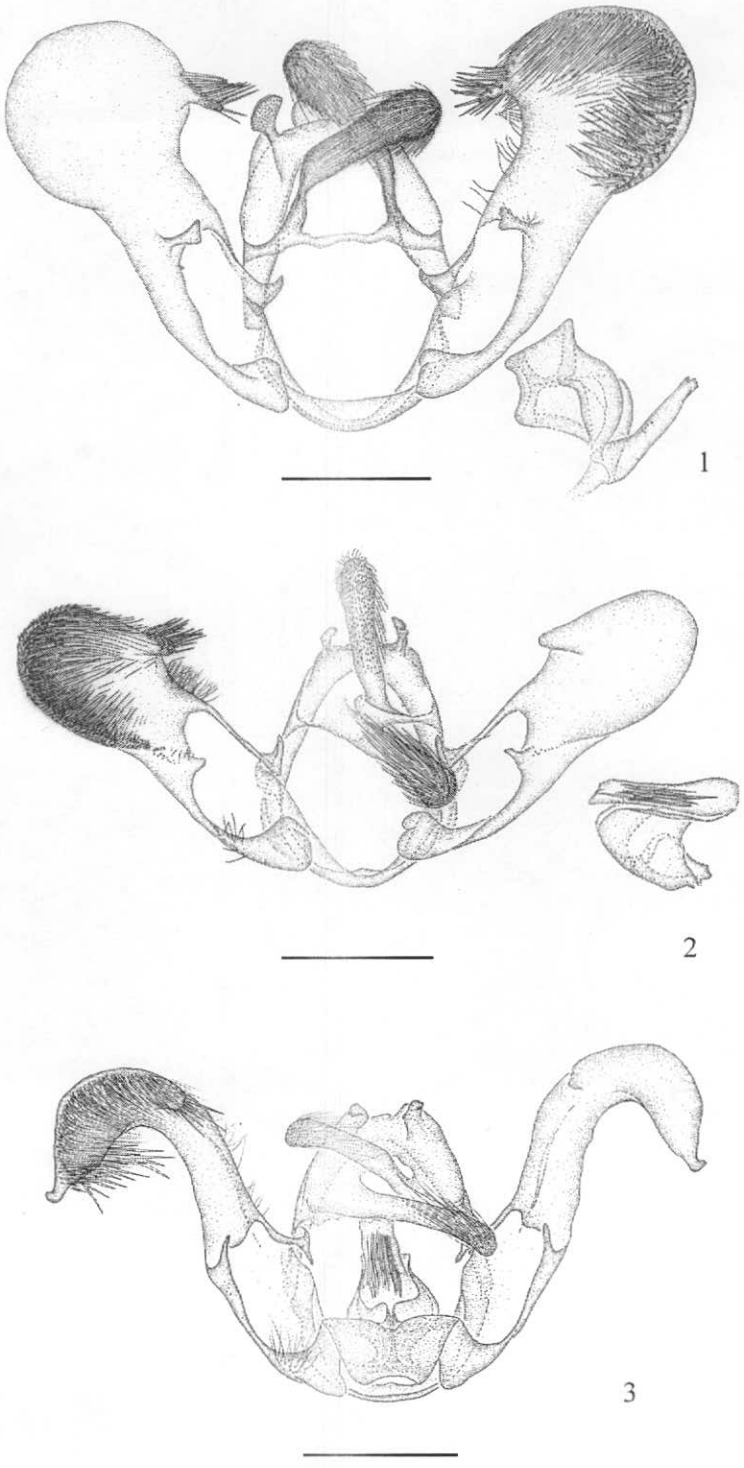


Figure 63 Male genitalia. 63.1. *Rhopobota* sp. C, NP142. 63.2. *R.* sp. D, NP376. 63.3. *R.* sp. E, NP726. Scales = 0.5 mm.

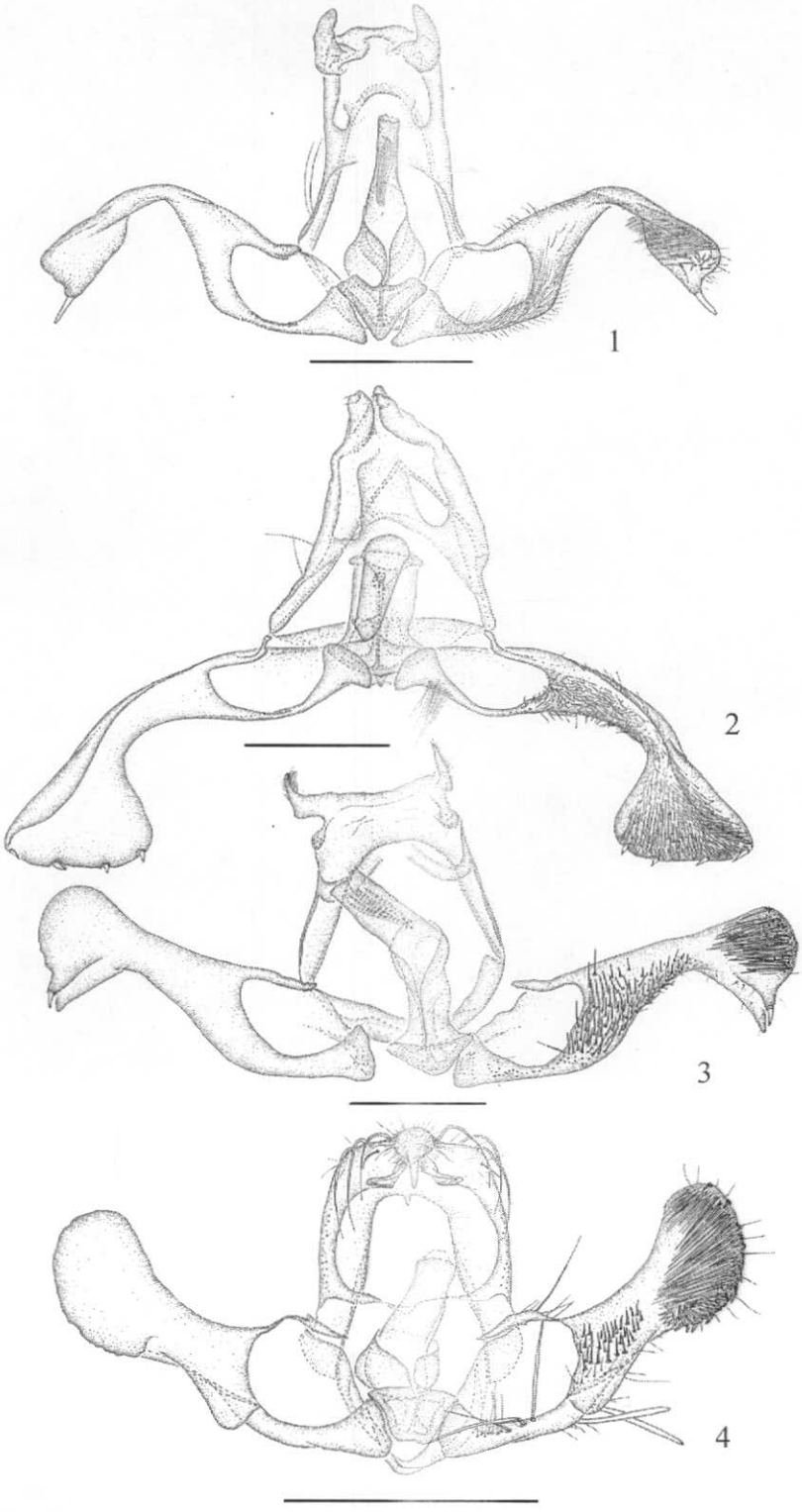


Figure 64 Male genitalia. 64.1. *Spilonota babylonica* (Meyrick), NP568. 64.2. *S. melanocopa* (Meyrick), NP370. 64.3. *Strepsicrates discobola* Diakonoff, NP167. 64.4. *Tritopterna anachastopa* (Meyrick), NP516. Scales = 0.5 mm.

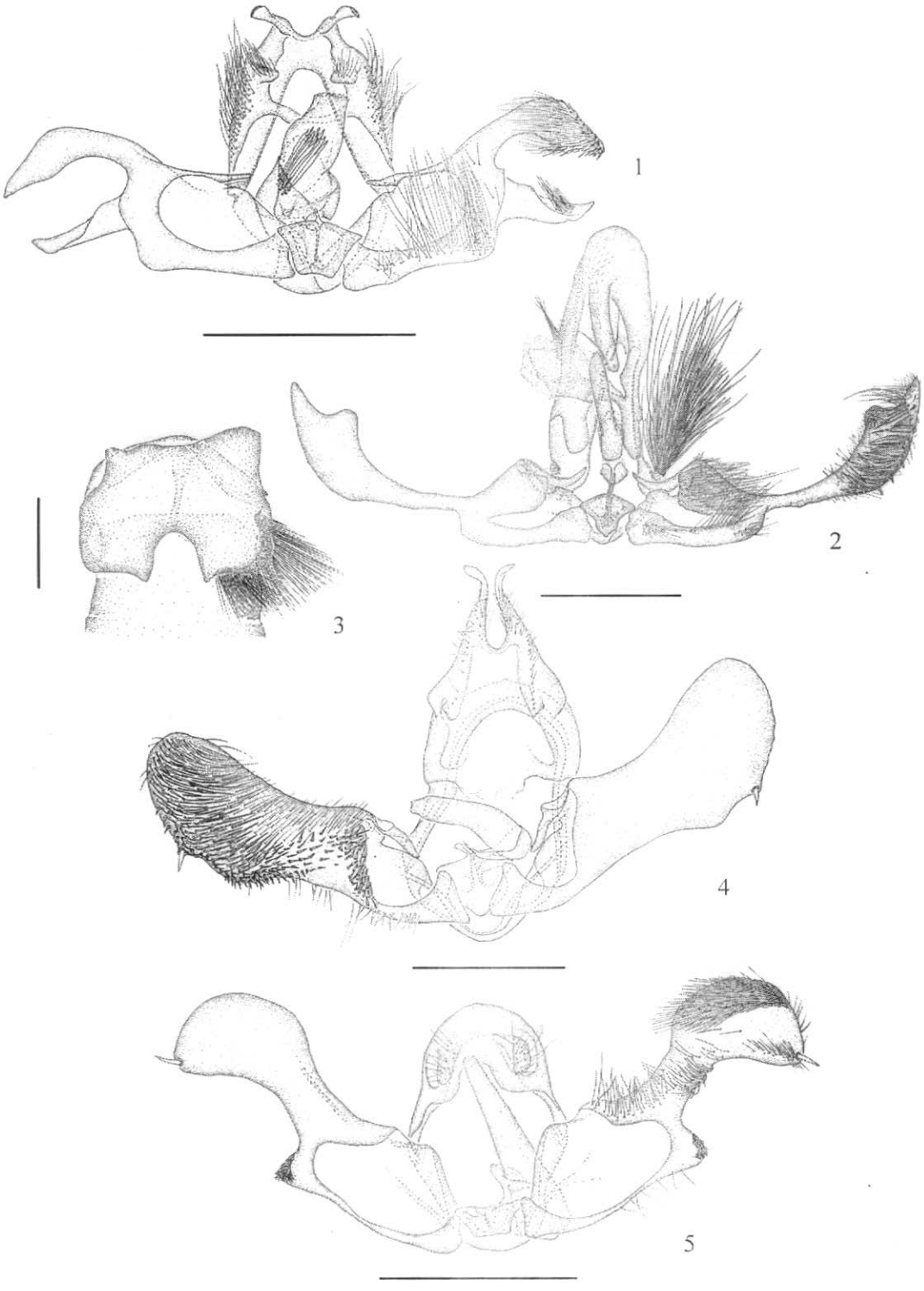


Figure 65 Male genitalia. 65.1. Eucosmini genus A sp. A, NP522. 65.2. Eucosmini genus D sp. A, NP510. 65.3. Eucosmini genus D sp. A, abdomen, NP510. 65.4. Eucosmini genus E sp. A. 65.5. Eucosmini genus F sp. A. Scales = 0.5 mm.

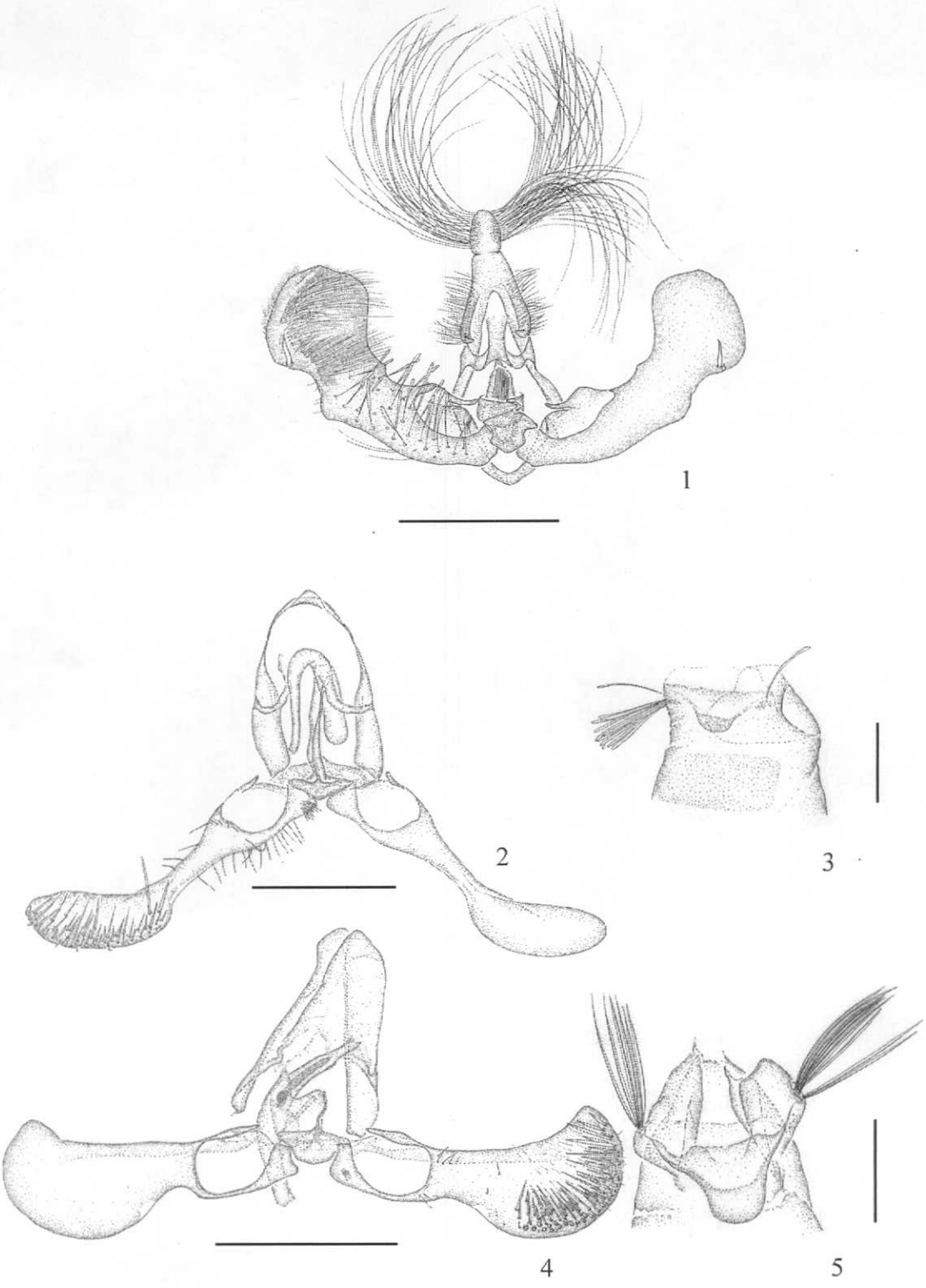


Figure 68 Male genitalia. 68.1. Eucosmini genus S sp. A, NP663.
68.2. *Acanthoclita balanoptycha* (Meyrick), NP638.
68.3. *A. balanoptycha*, abdomen, NP638. 68.4. *A.* sp. A, NP418.
68.5. *A.* sp. A, abdomen, NP418. Scales = 0.5 mm.

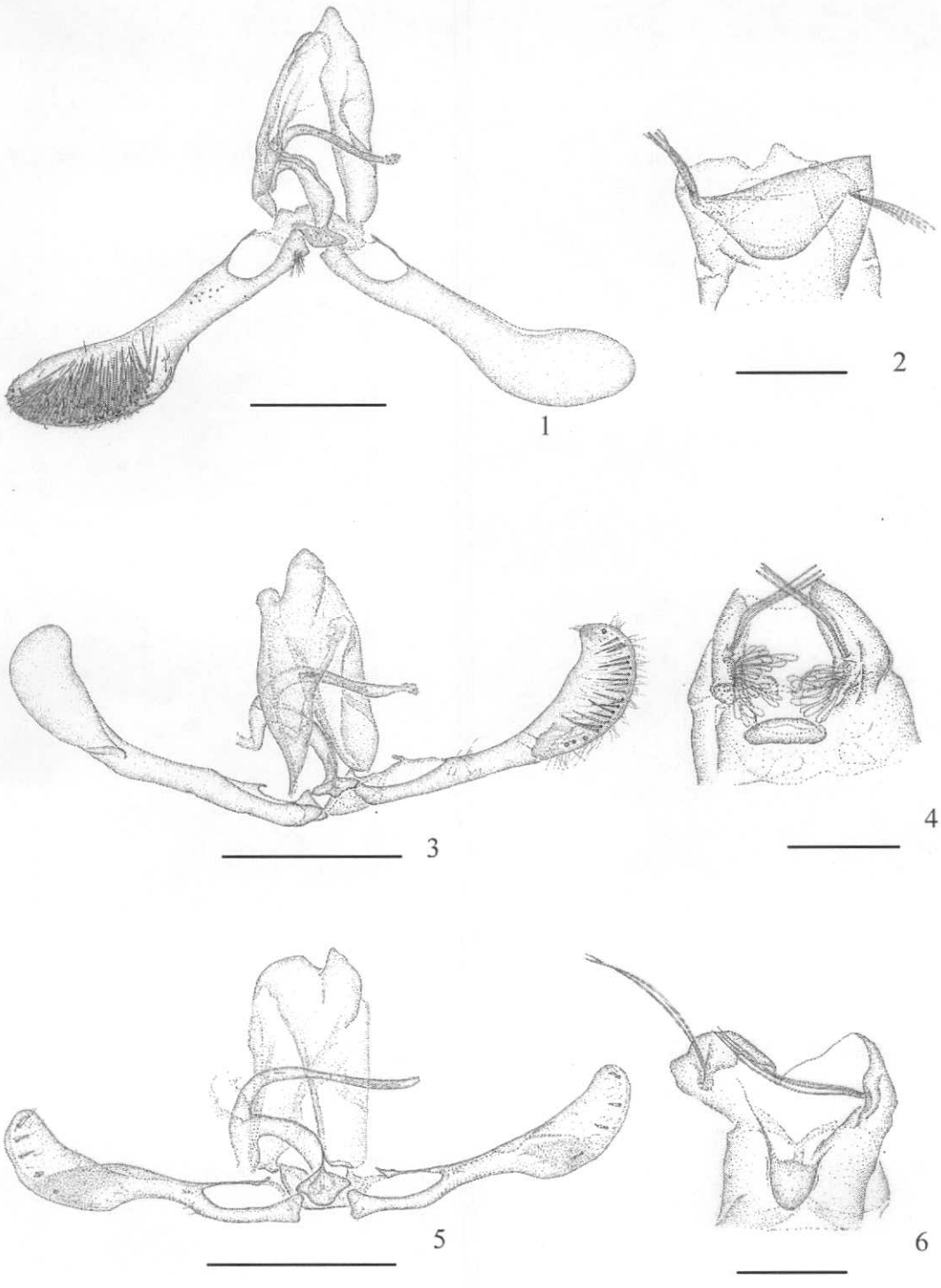


Figure 69 Male genitalia. 69.1. *Acanthoclita* sp. C, NP538. 69.2. *A.* sp. C, abdomen. 69.3. *A.* sp. D, NP256. 69.4. *A.* sp. D, abdomen, NP256. 69.5. *A.* sp. F, NP499. 69.6. *A.* sp. F, abdomen, NP499. Scales = 0.5 mm.

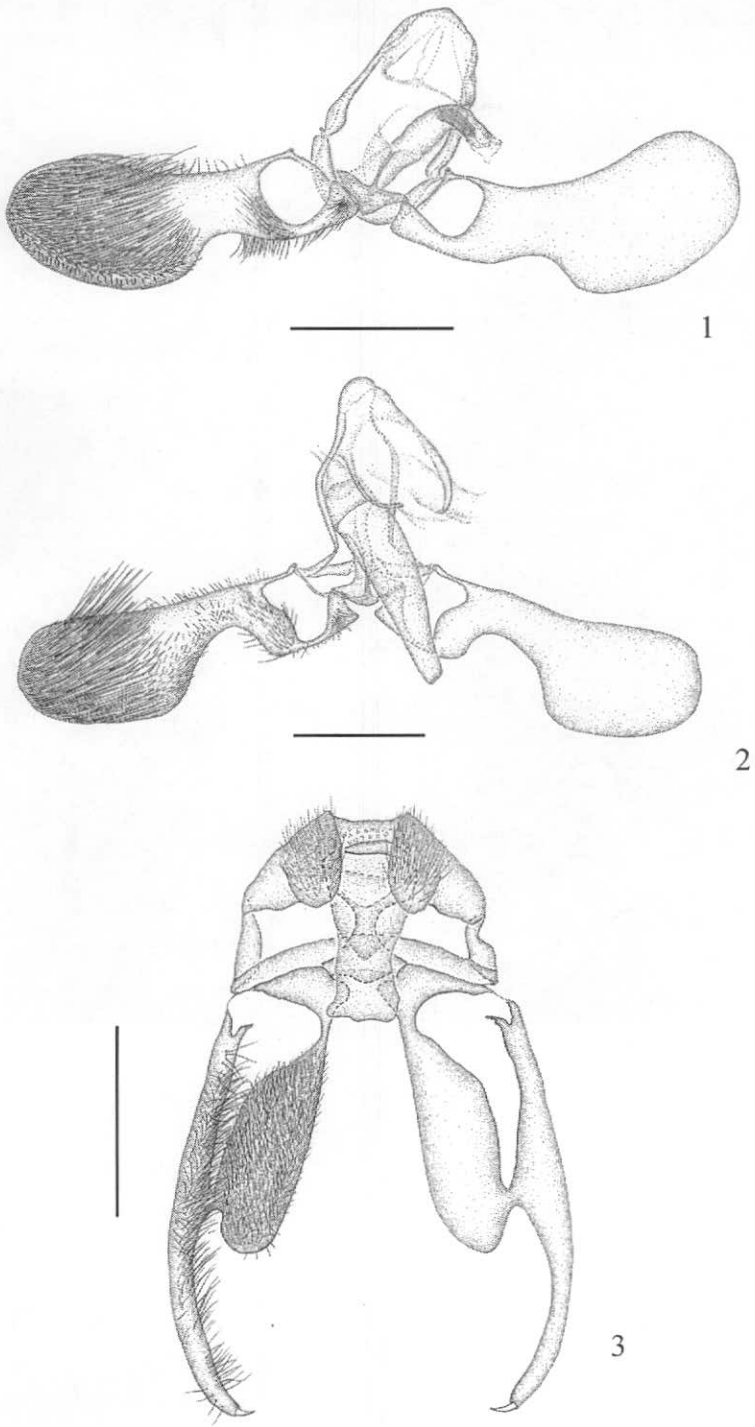


Figure 70 Male genitalia. 70.1. *Andrioplecta shoreae* Komai, NP466. 70.2. *A. subpulverula* (Obraztsov), NP422. 70.3. *Cimeliomorpha cymbalora* (Meyrick), NP757. Scales = 0.5 mm.

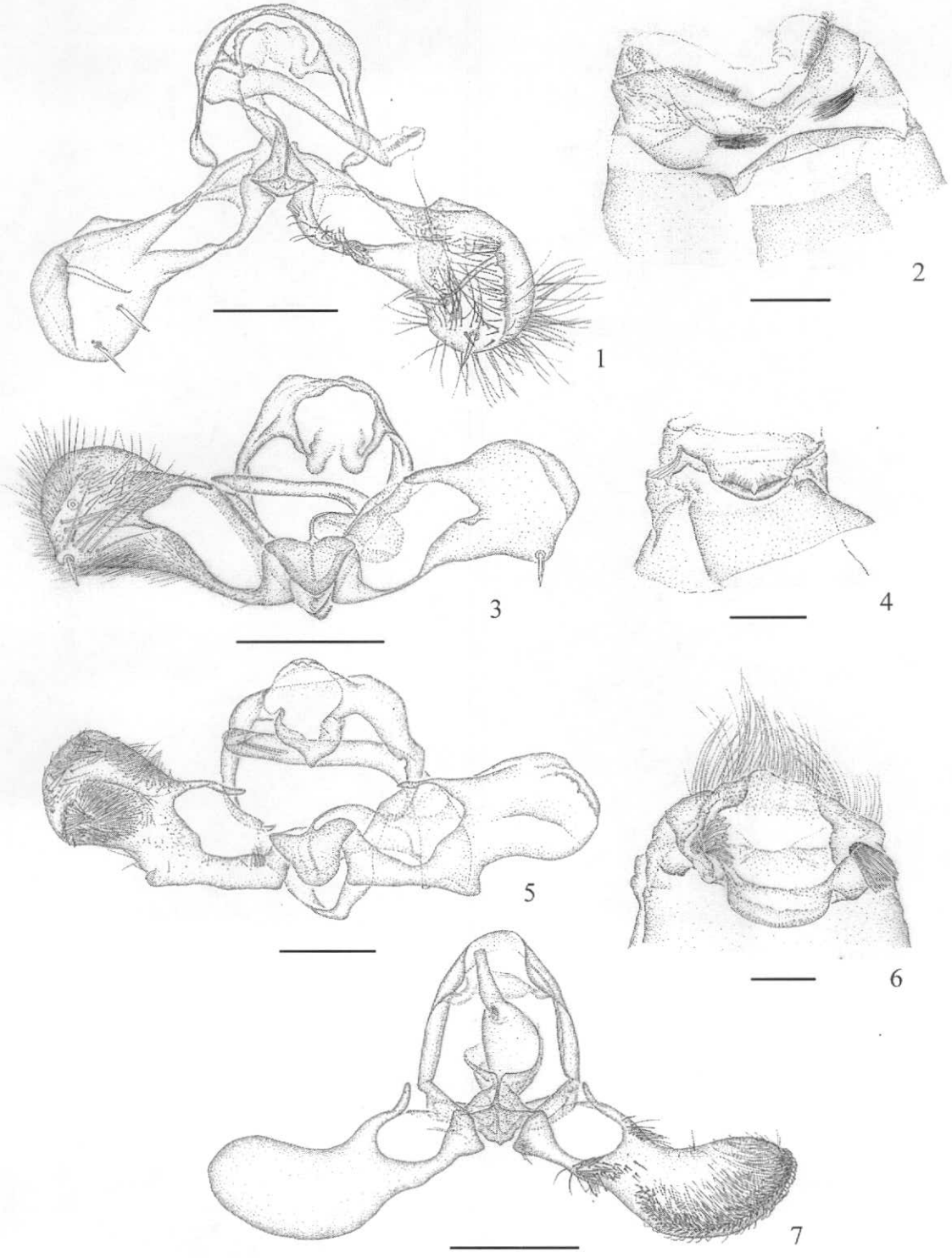


Figure 71 Male genitalia. 71.1. *Cryptophlebia ombrodelta* (Lower), NP425. 71.2. *C. ombrodelta*, abdomen, NP425. 71.3. *C. repletana* (Walker), NP646. 71.4. *C. repletana*, abdomen, NP646. 71.5. *C. rhynchias* (Meyrick), NP592. 71.6. *C. rhynchias*, abdomen, NP592. 71.7. *Cydia malesana* (Meyrick), NP399. Scales = 0.5 mm.

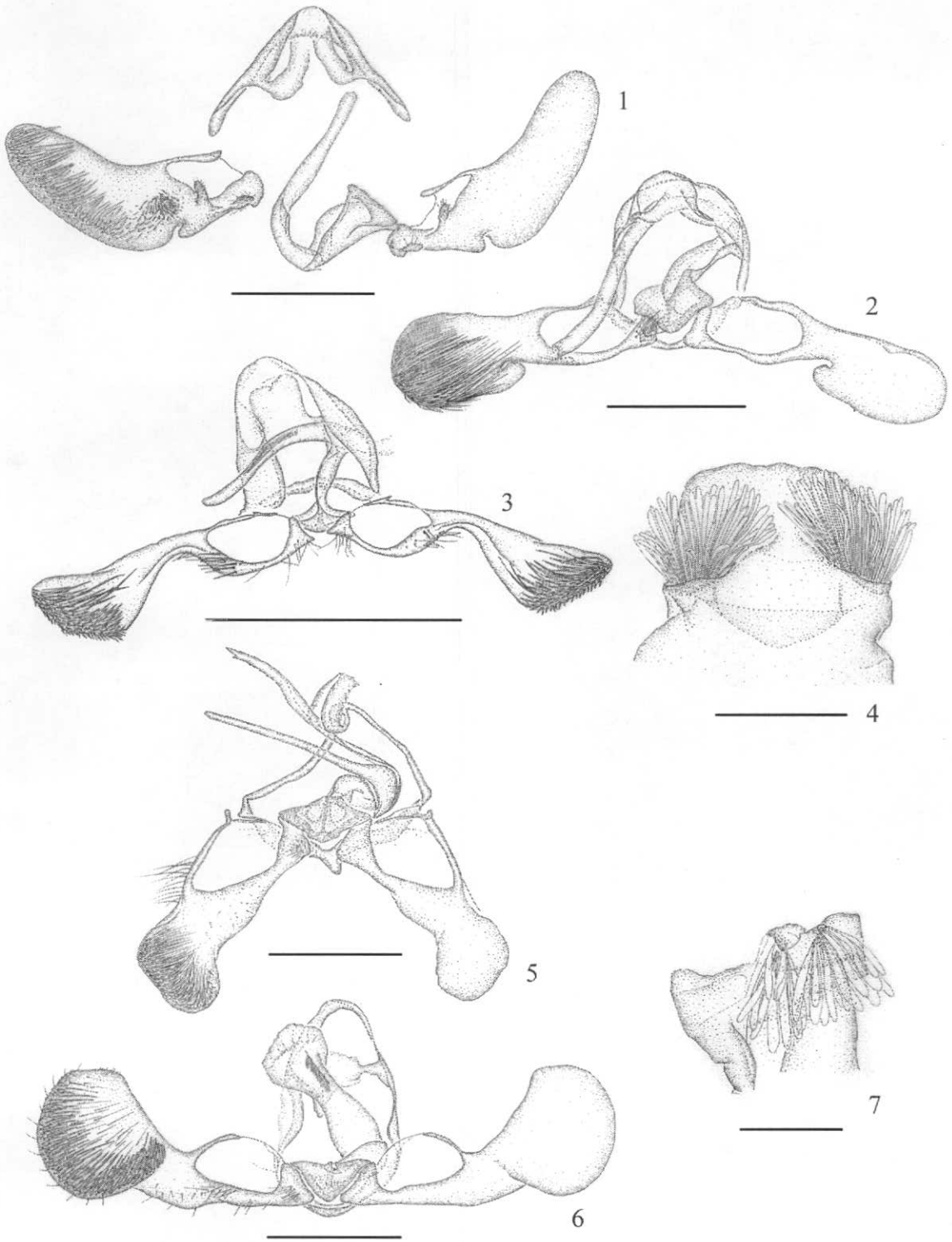


Figure 72 Male genitalia. 72.1. *Cydia obumbrana* Kuznetsov, NP258. 72.2. *Dichrorampha* sp. A, NP584. 72.3. *Dierlia* sp. A, NP500. 72.4. *D.* sp. A, abdomen, NP500. 72.5. *Fulcrifera tricentra* (Meyrick) NP710. 72.6. *Grapholita comanticosta* Kuznetsov, NP413. 72.7. *G. comanticosta*, abdomen, NP173. Scales = 0.5 mm.

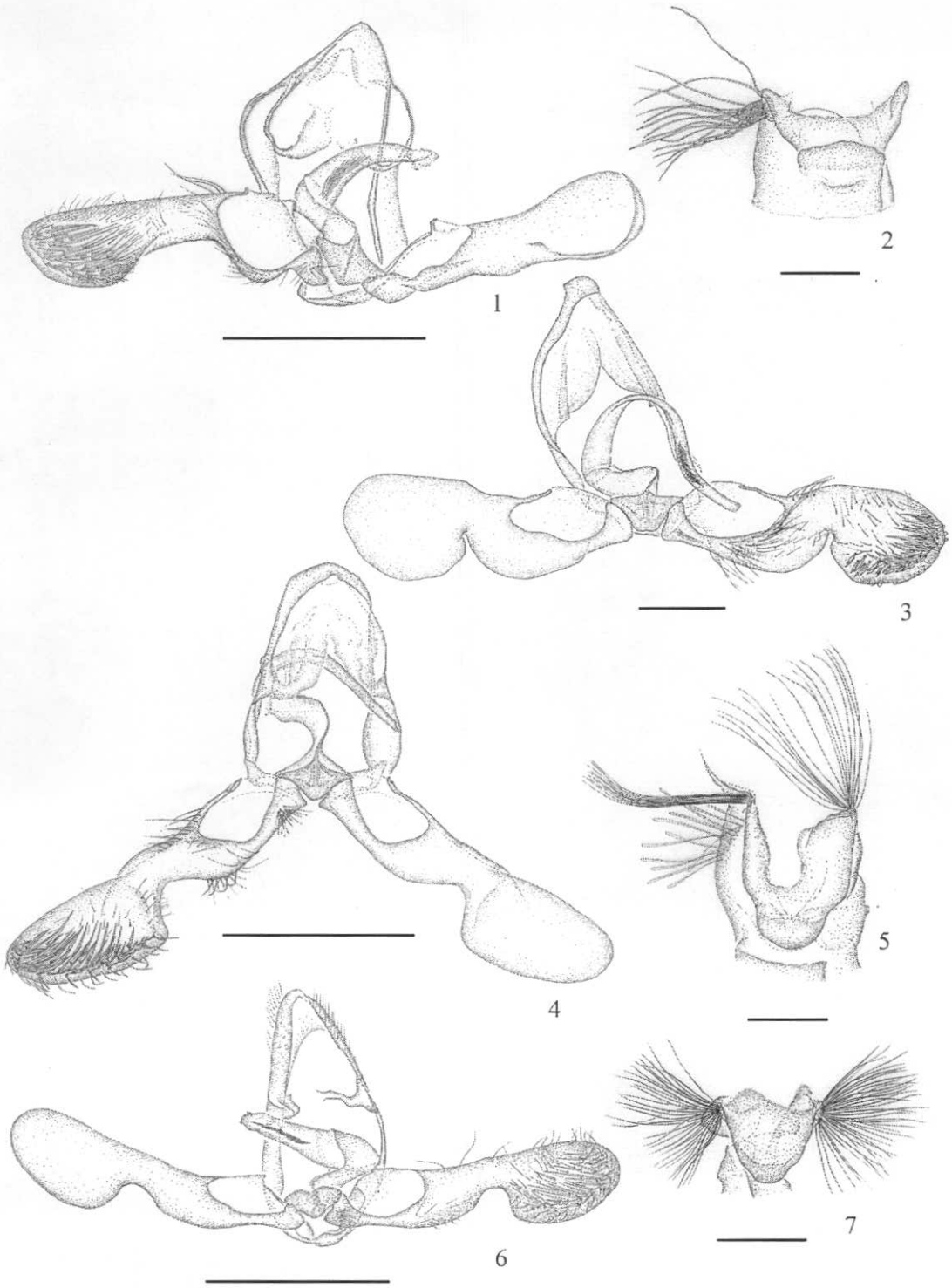


Figure 73 Male genitalia. 73.1. *Grapholita dysaetria* Diakonoff, NP597. 73.2. *G. dysaetria*, abdomen, NP597. 73.3. *Grapholita seclusana* (Walker), NP247. 73.4. *G.* sp. A, NP404. 73.5. *G.* sp. A, abdomen, NP404. 73.6. *G.* sp. B, NP683. 73.7. *G.* sp. B, abdomen, NP683. Scales = 0.5 mm.

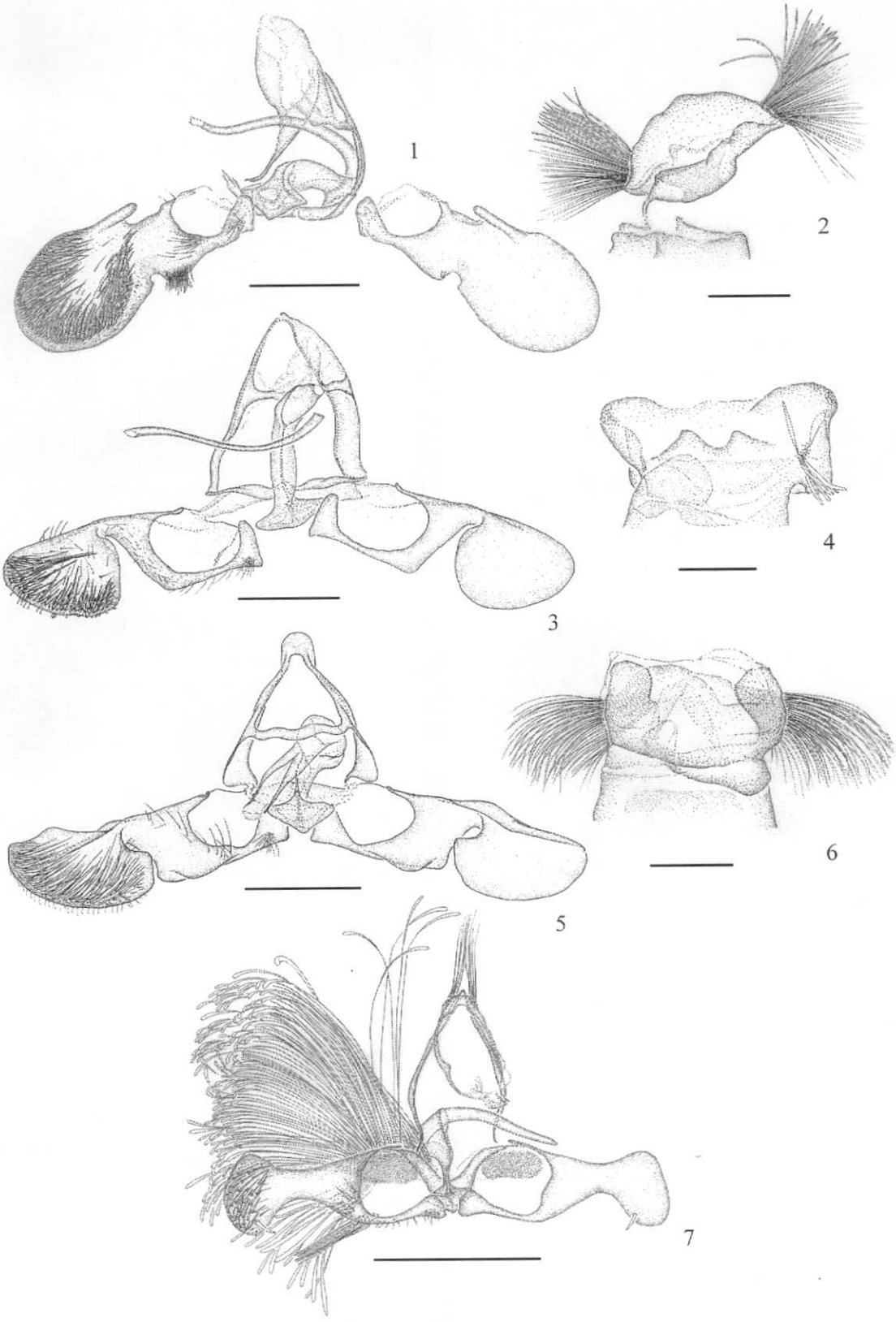


Figure 74 Male genitalia. 74.1. *Grapholita* sp. C, NP401. 74.2. *G.* sp. C, abdomen, NP401. 74.3. *Grapholita* sp. E, NP339. 74.4. *G.* sp. E, abdomen, NP339. 74.5. *G.* sp. F, NP570. 74.6. *G.* sp. F, abdomen, NP570. 74.7. *Karacaoglania* sp. A, NP530. Scales = 0.5 mm.

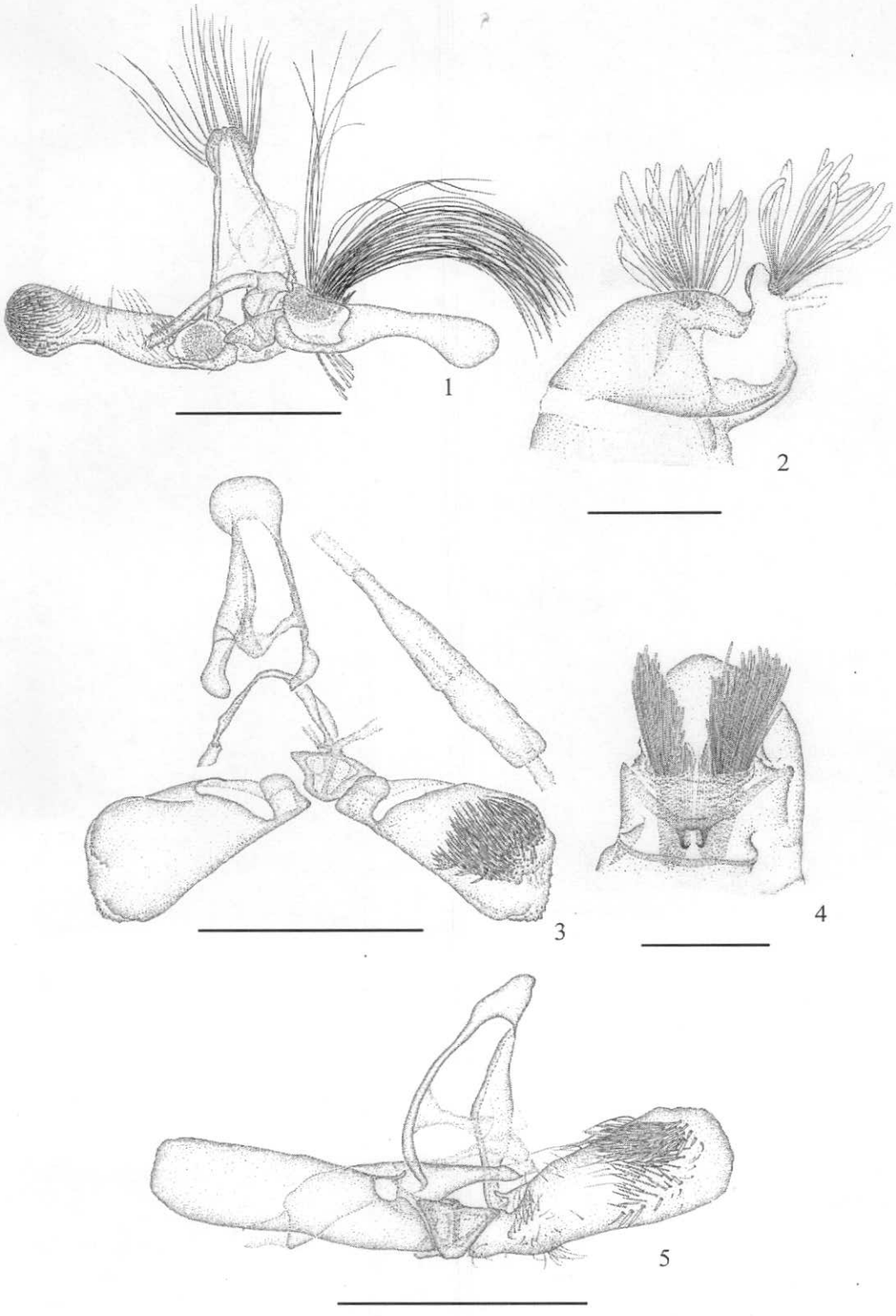


Figure 75 Male genitalia. 75.1. *Karacaoglania* sp. B, NP487. 75.2. *K.* sp. B, abdomen, NP487. 75.3. *Microsarotis lucida* (Meyrick), NP395. 75.4. *M. lucida*, abdomen, NP395. 75.5. *M. palamedes* (Meyrick), NP343. Scales = 0.5 mm.

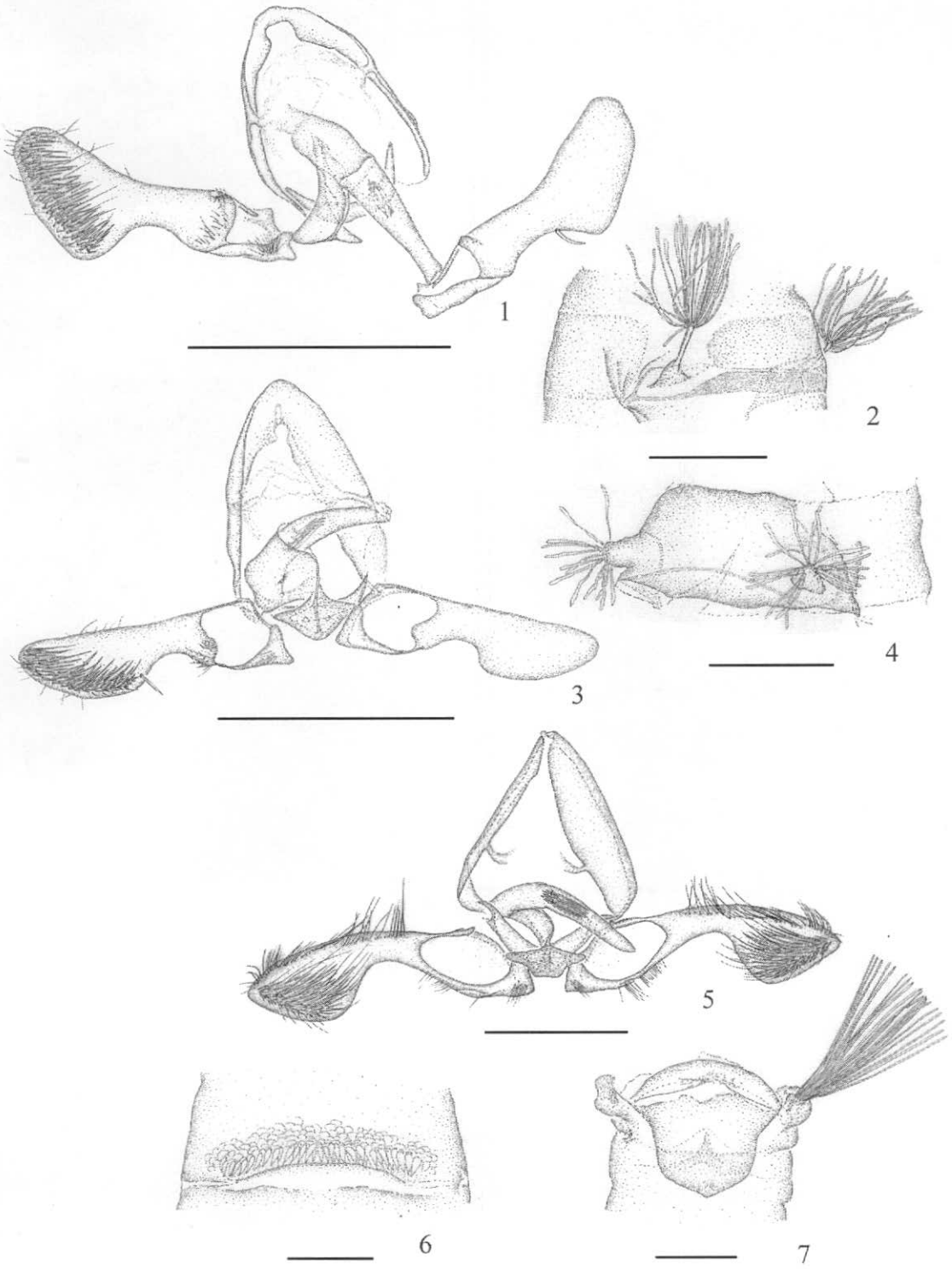


Figure 76 Male genitalia. 76.1. *Pammene* sp. A, NP521. 76.2. *P.* sp. A, abdomen, NP521. 76.3. *P.* sp. B, NP527. 76.4. *P.* sp. B, abdomen, NP527. 76.5. *Parapammene* sp. A, NP420. 76.6-76.7. *P.* sp. A, abdomen, NP420. Scales = 0.5 mm.

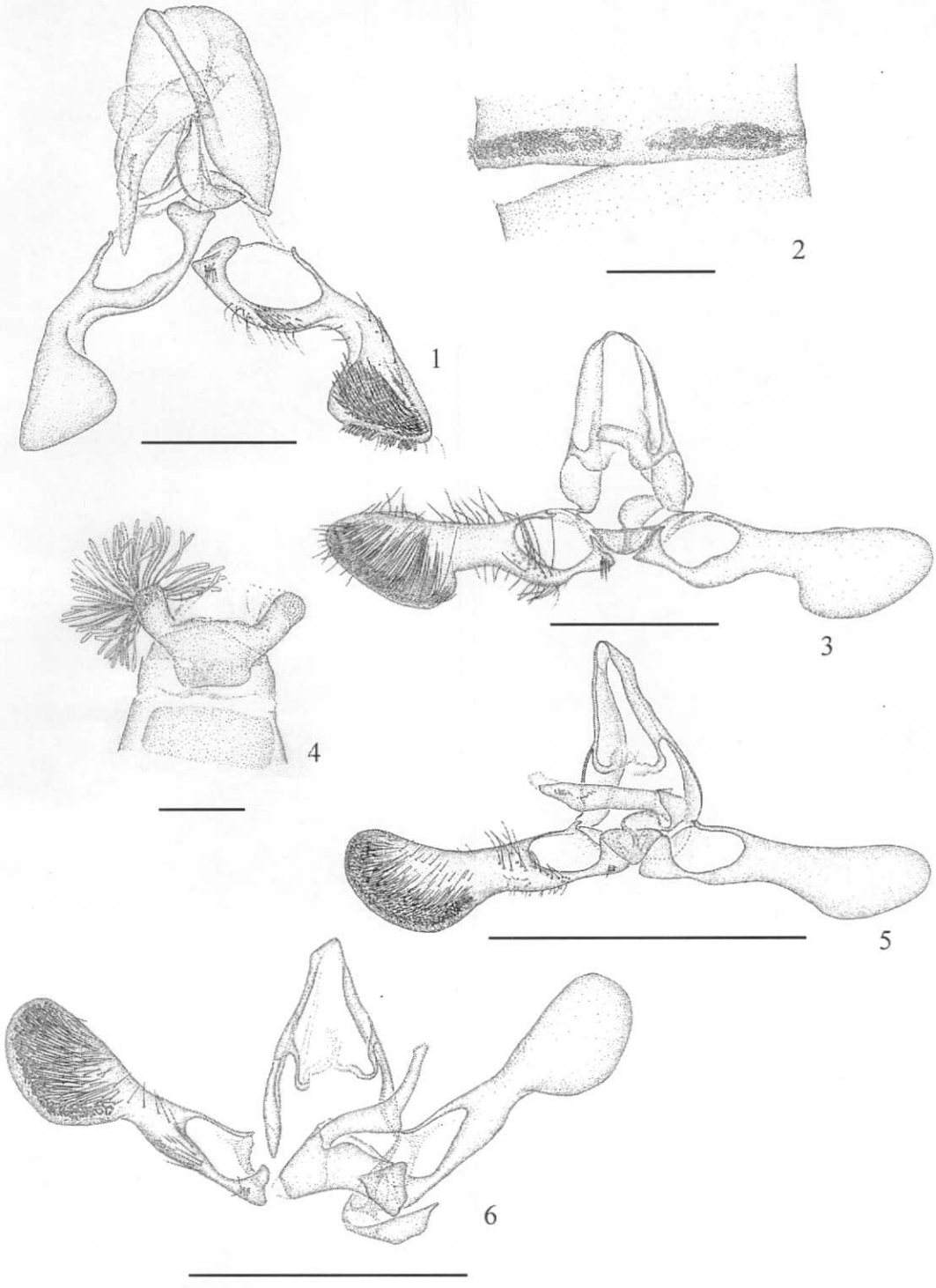


Figure 77 Male genitalia. 77.1. *Parapammene* sp. B, NP164. 77.2. *P.* sp. B, abdomen, NP164. 77.3. *P.* sp. E, NP619. 77.4. *P.* sp. E, abdomen, NP619. 77.5. *Strophedra* sp. A, NP407. 77.6. *Strophedra* sp. B, NP455. Scales = 0.5 mm.

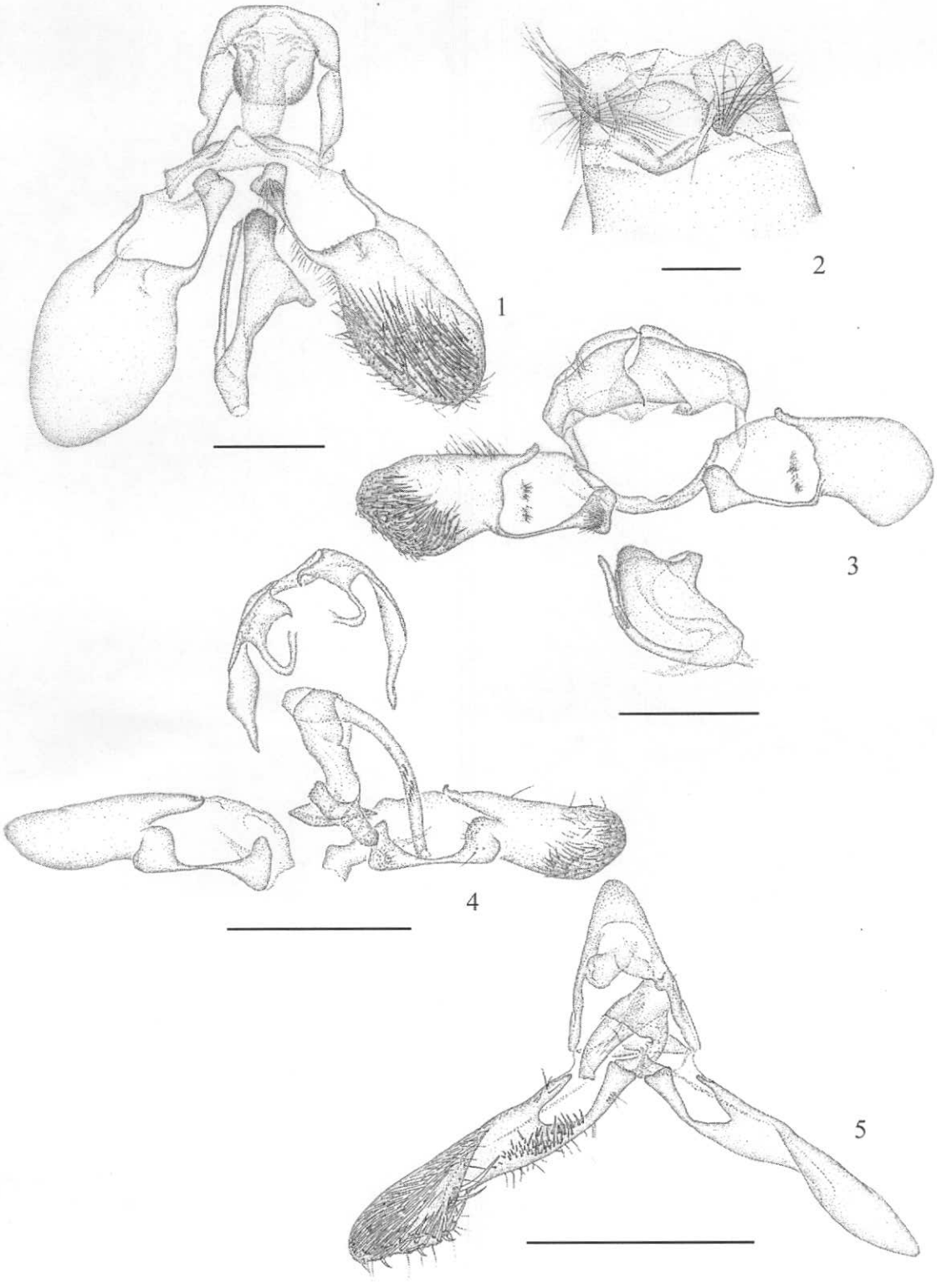
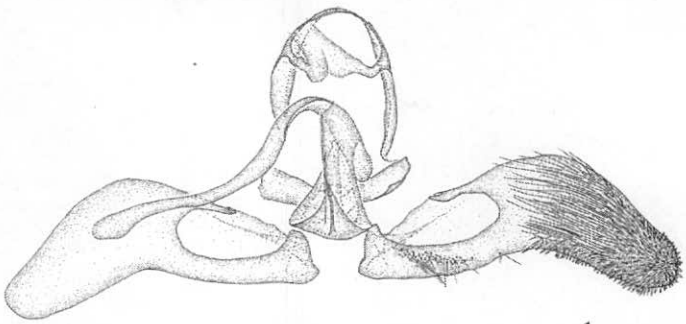


Figure 78 Male genitalia. 78.1. *Thaumatotibia hemitoma (*Diakonoff), NP367. 78.2 *T. hemitoma*, abdomen, NP367. 78.3. *T.* sp. C, NP454. 78.4. *T.* sp. D, NP745. 78.5. Grapholitini genus A sp. A, NP360. Scales = 0.5 mm.



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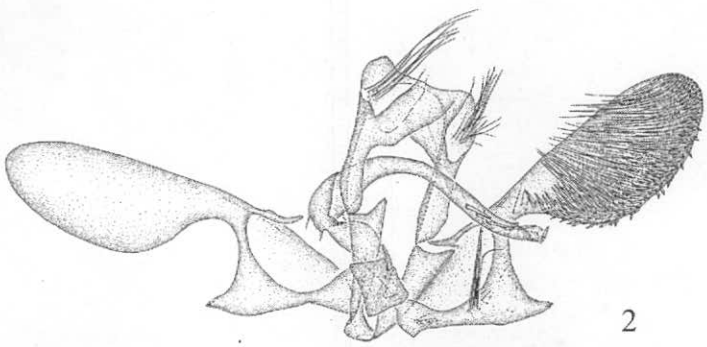

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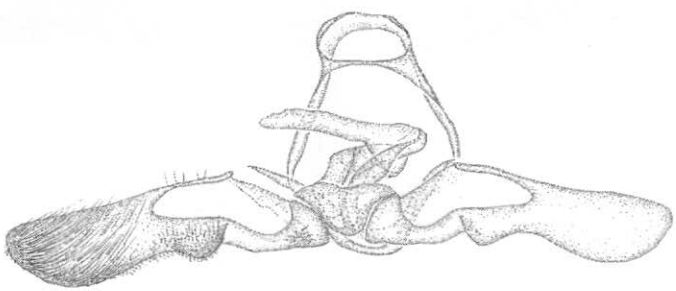

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Figure 79 Male genitalia. 79.1. Grapholitini genus B sp. A, NP263. 79.2. Grapholitini genus H sp. A, NP260. 79.3. Grapholitini genus M sp. A, NP716. Scales = 0.5 mm.

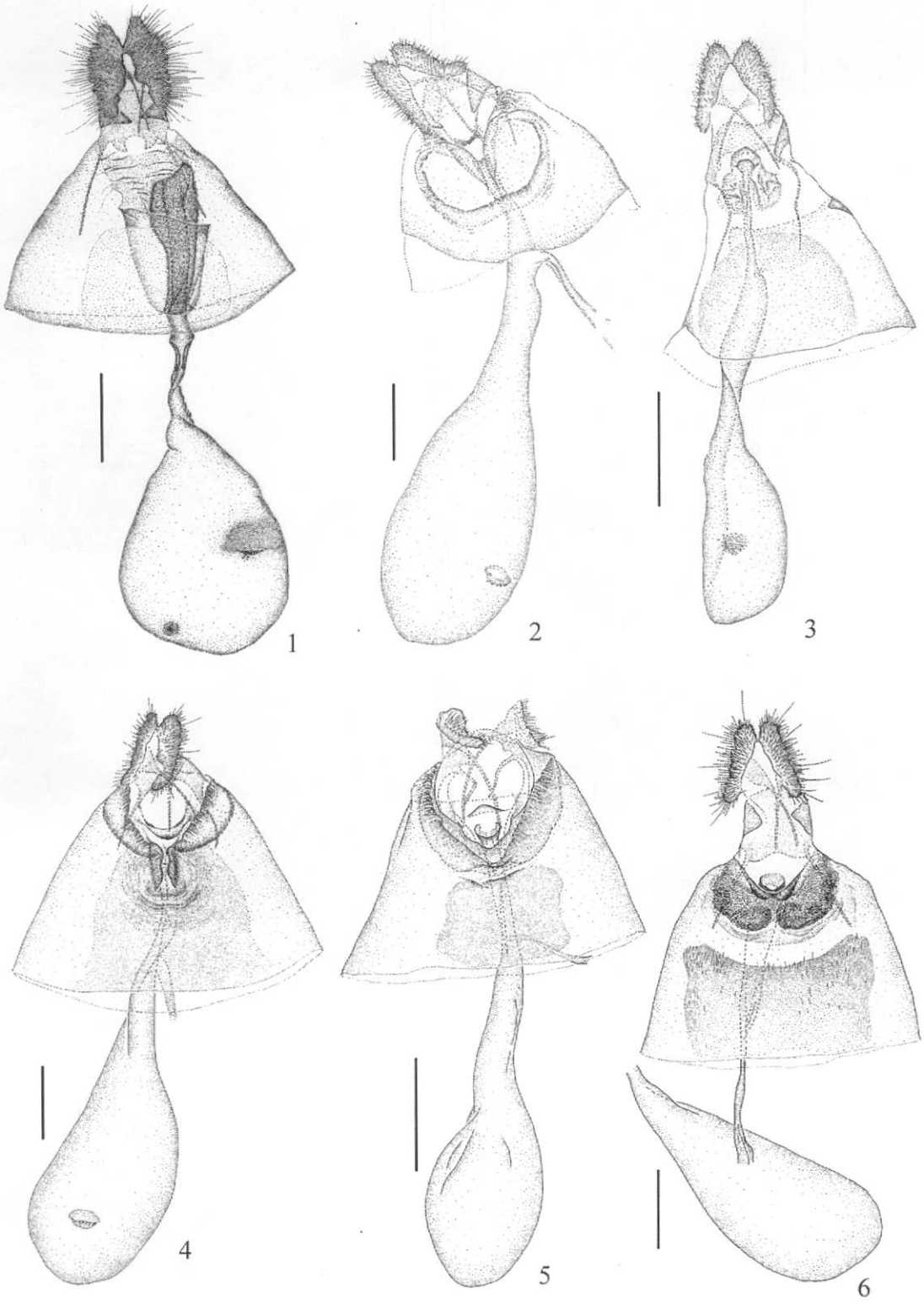

Figure 80 Female genitalia. 80.1. *Gatesclarkeana idia* Diakonoff, NP296. 80.2. *Bactra coronata* Diakonoff, NP634. 80.3. *B. honesta* (Meyrick), NP738. 80.4. *B. venosana* (Zeller), NP374. 80.5. *B.* sp. B, NP449. 80.6. *Bubonoxena* sp. A, NP458. Scales = 0.5 mm.

Figure 81 Female genitalia. 81.1. *Bubonoxena* sp. B, NP573.
81.2. *Apsidophora purpurorbis* Diakonoff, NP33.
81.3. *Argyroptocha phalaenopa* (Diakonoff), NP110.
81.4. *Dicephalarcha herbosa* (Meyrick), NP378.
81.5. *Dudua aprobola* (Meyrick), NP457. Scales = 0.5 mm.

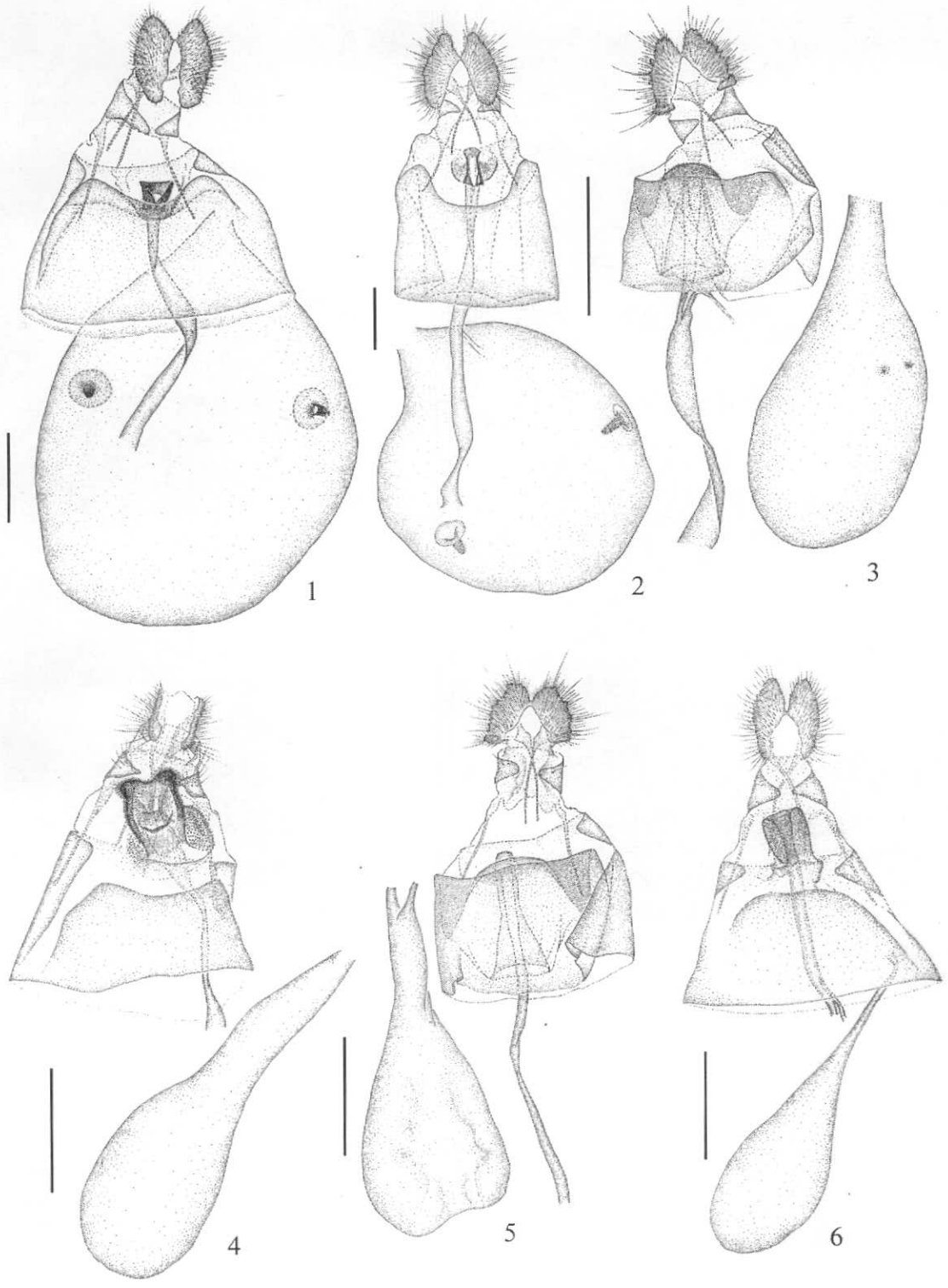

Figure 82 Male genitalia. 82.1. *Dudua brachytoma* Diakonoff, NP27. 82.2. *D. tetanota* (Meyrick), NP100. 82.3. *Lobesia aeolopa* Meyrick, NP479. 82.4. *L. kurokoi* Bae, NP599. 82.5. *L. lithogonia* Diakonoff, NP471. 82.6. *L.* sp. A, NP650. Scales = 0.5 mm.

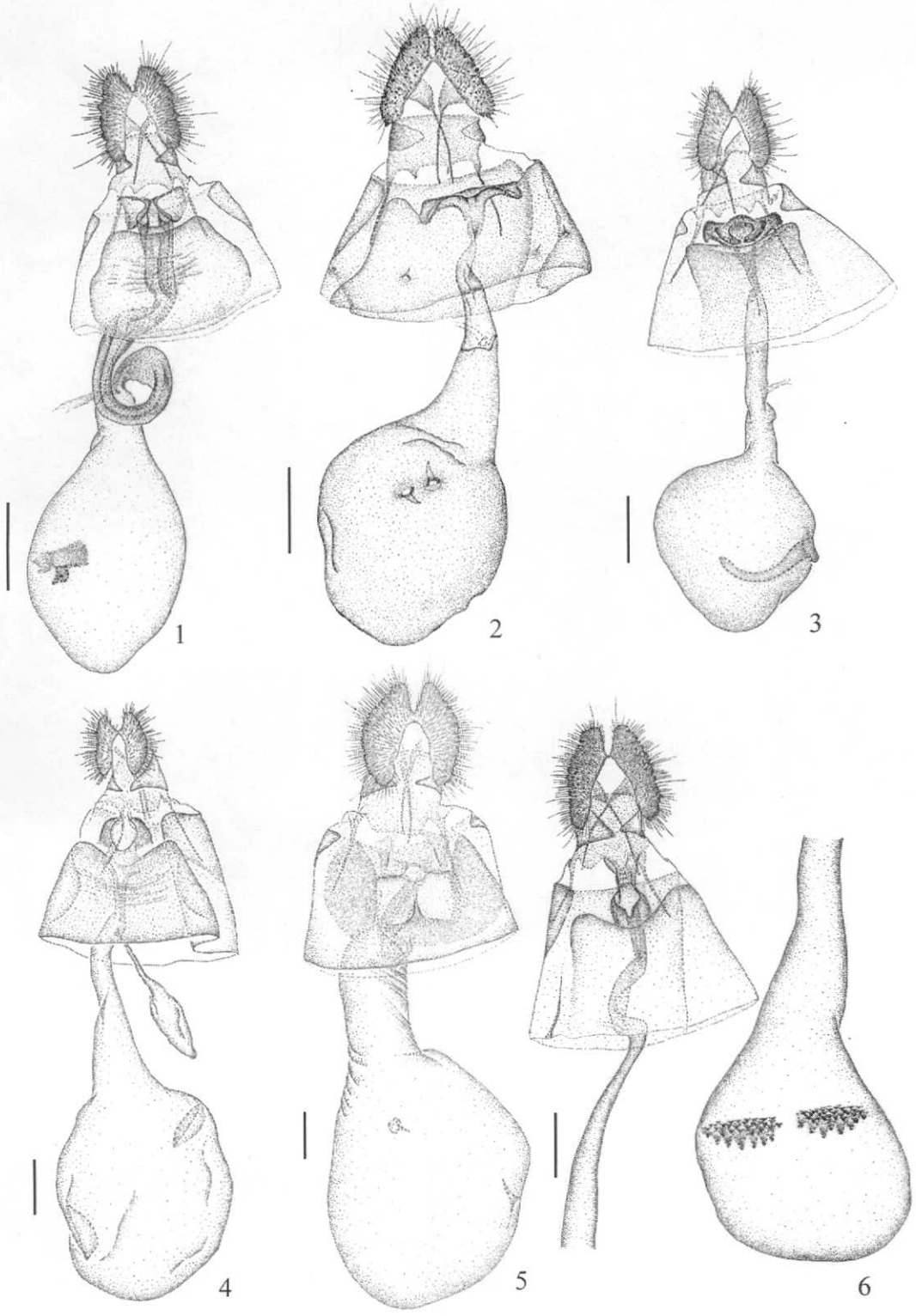

Figure 83 Male genitalia. 83.1. *Megalota fallax* (Meyrick), NP363. 83.2. *Neohermenias* sp. A, NP162. 83.3. *Ophiorrhabda mormopa* (Meyrick), NP466. 83.4. *Phaecadophora fimbriata* Walsingham, NP755. 83.5. *Phaecasiophora walsinghami* Diakonoff, NP673. 83.6. *Phaulacantha metamelas* Diakonoff, NP107. Scales = 0.5 mm.

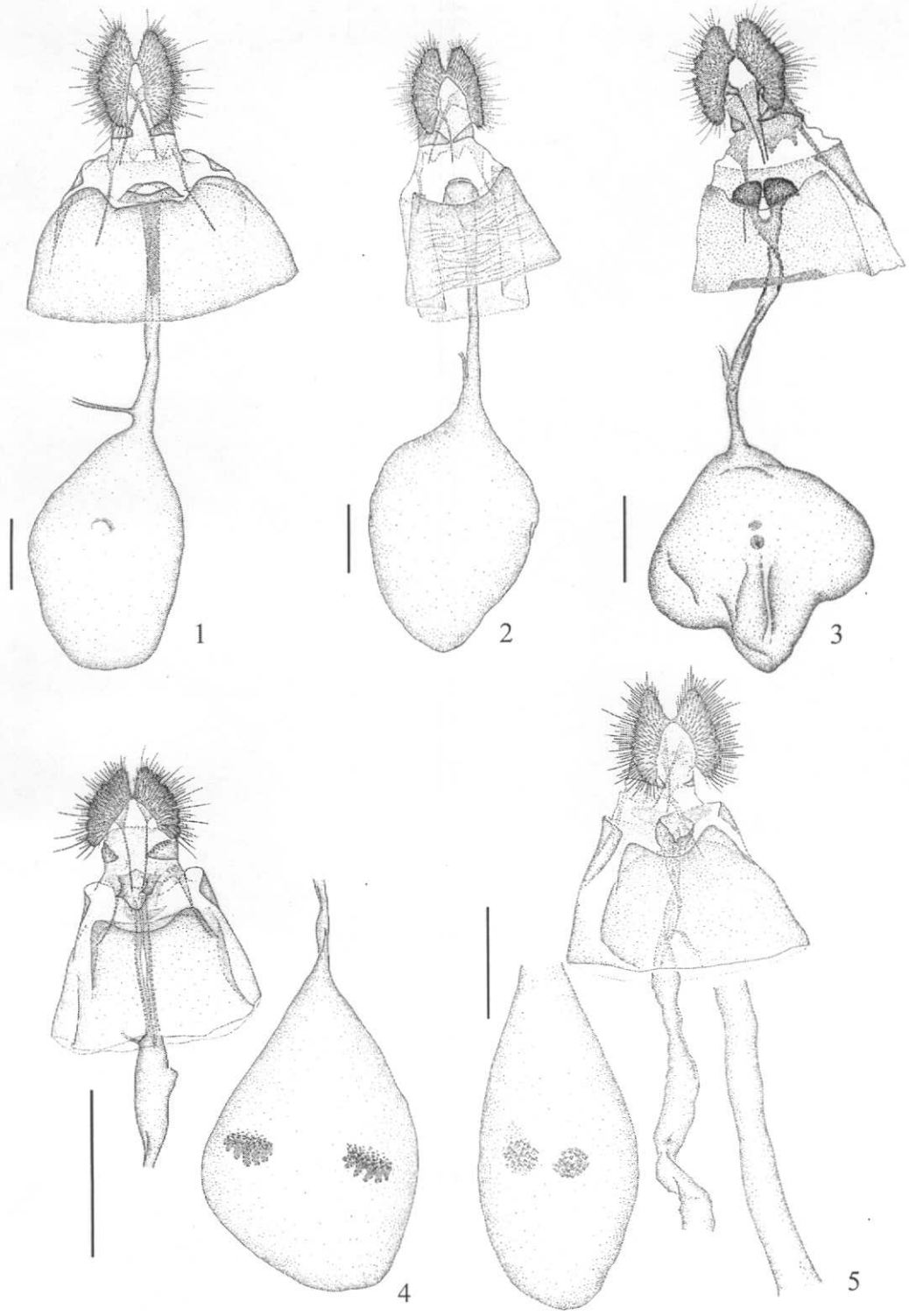

Figure 84 Female genitalia. 84.1. *Sorolopha nagaii* Kawabe, NP429. 84.2. *S. semiculta* (Meyrick), NP140. 84.3. *S.* sp. B, NP439. 84.4. *Statherotis leucaspis* (Meyrick), NP240. 84.5. *S.* sp. A, NP602. Scales = 0.5 mm.

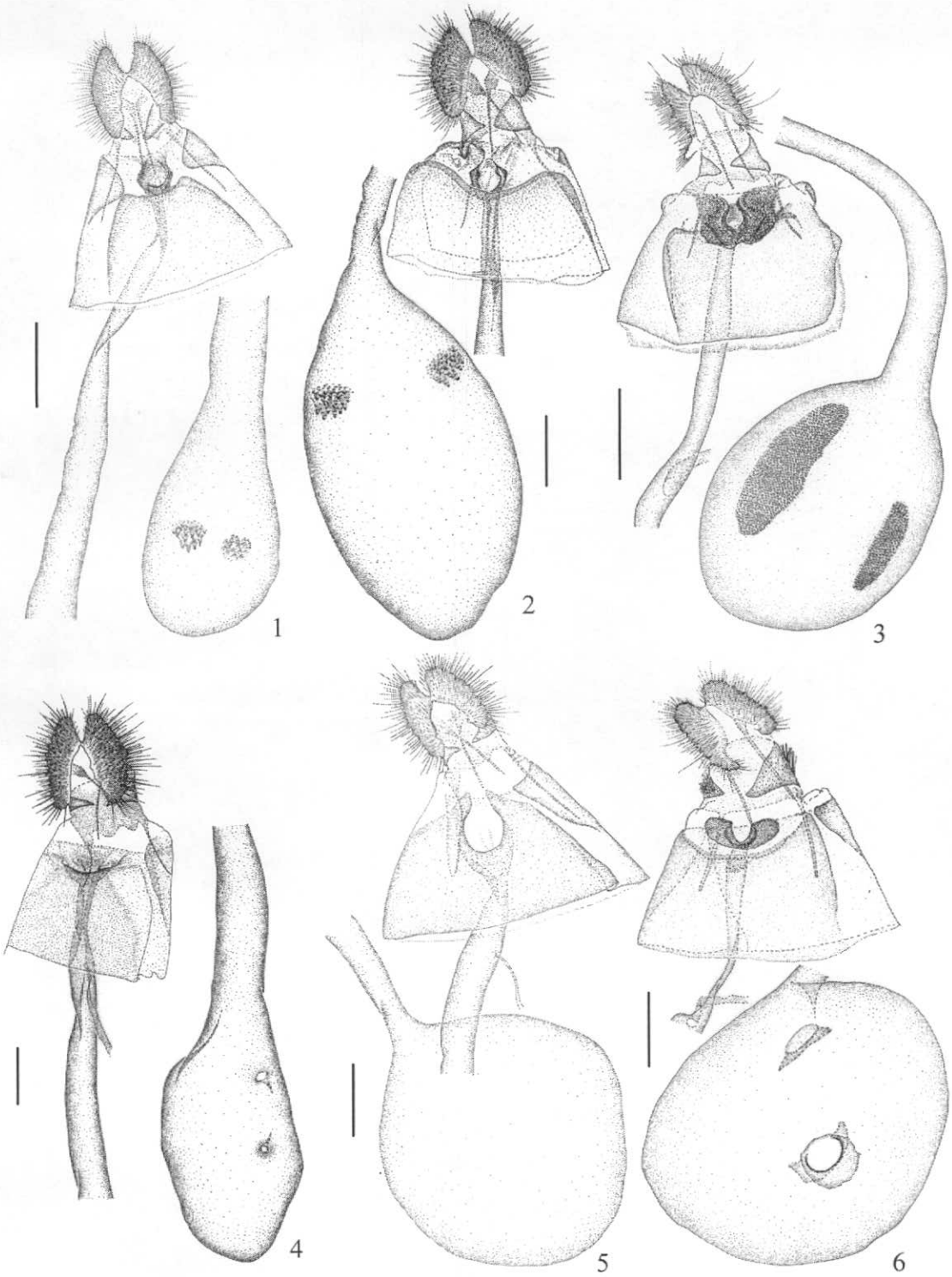

Figure 85 Female genitalia. 85.1. *Statherotis* sp. B, NP605. 85.2. *S.* sp. C, NP450. 85.3. *S.* sp. D, NP230. 85.4. *Sycacantha* sp. C, NP472. 85.5. *S.* sp. F, NP589. 85.6. *Thysanocrepis crossota* (Meyrick), NP468. Scales = 0.5 mm.

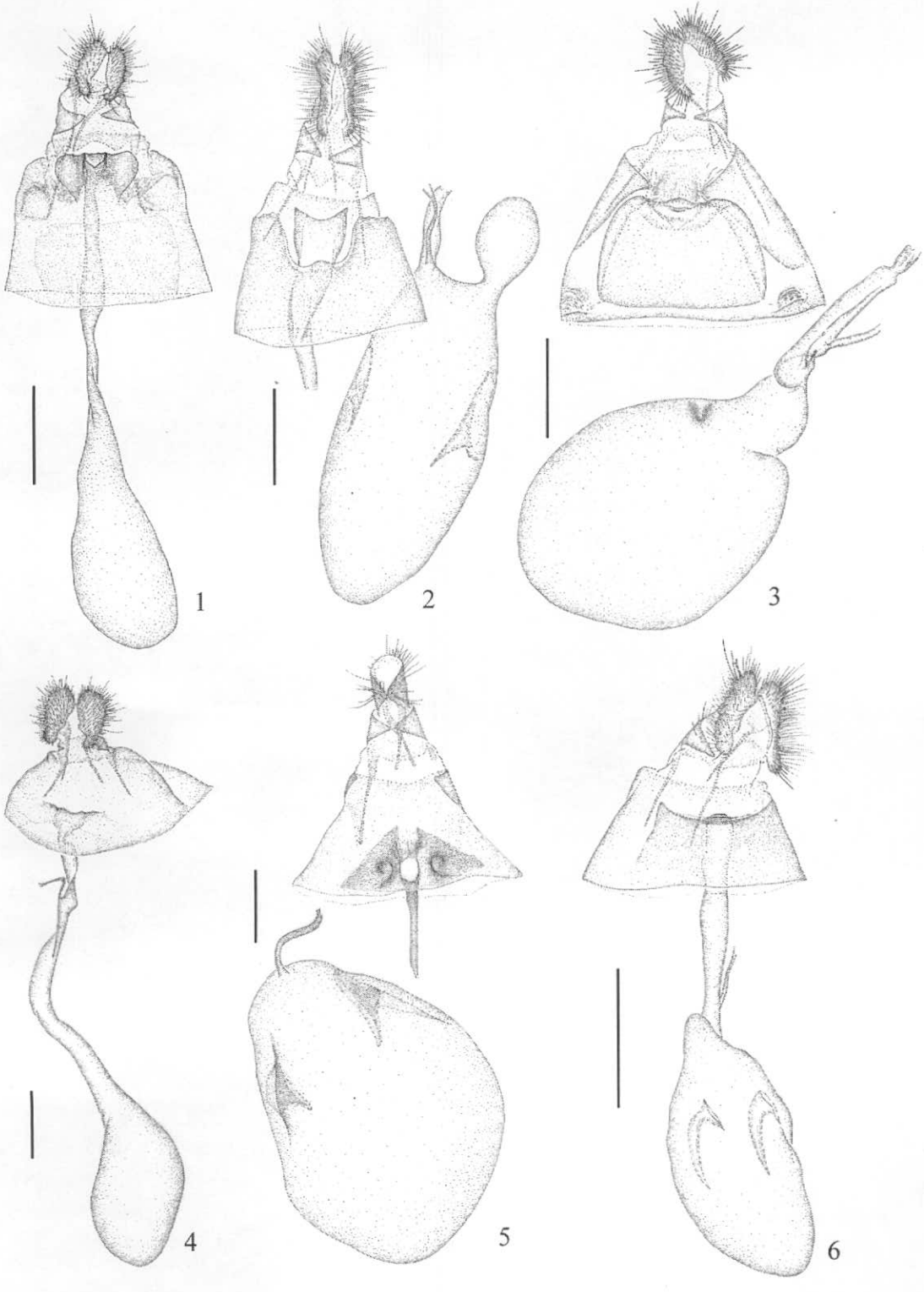

Figure 86 Female genitalia. 86.1. Olethreutini genus A sp. A, NP456. 86.2. *Ancylis aromatias* Meyrick, NP643. 86.3. *Loboschiza koenigiana* (Fabricius), NP628. 86.4. Enarmoniini genus A sp. A, NP372. 86.5. Enarmoniini genus C sp. A, NP96. 86.6. Enarmoniini genus G sp. A, NP601. Scales = 0.5 mm.

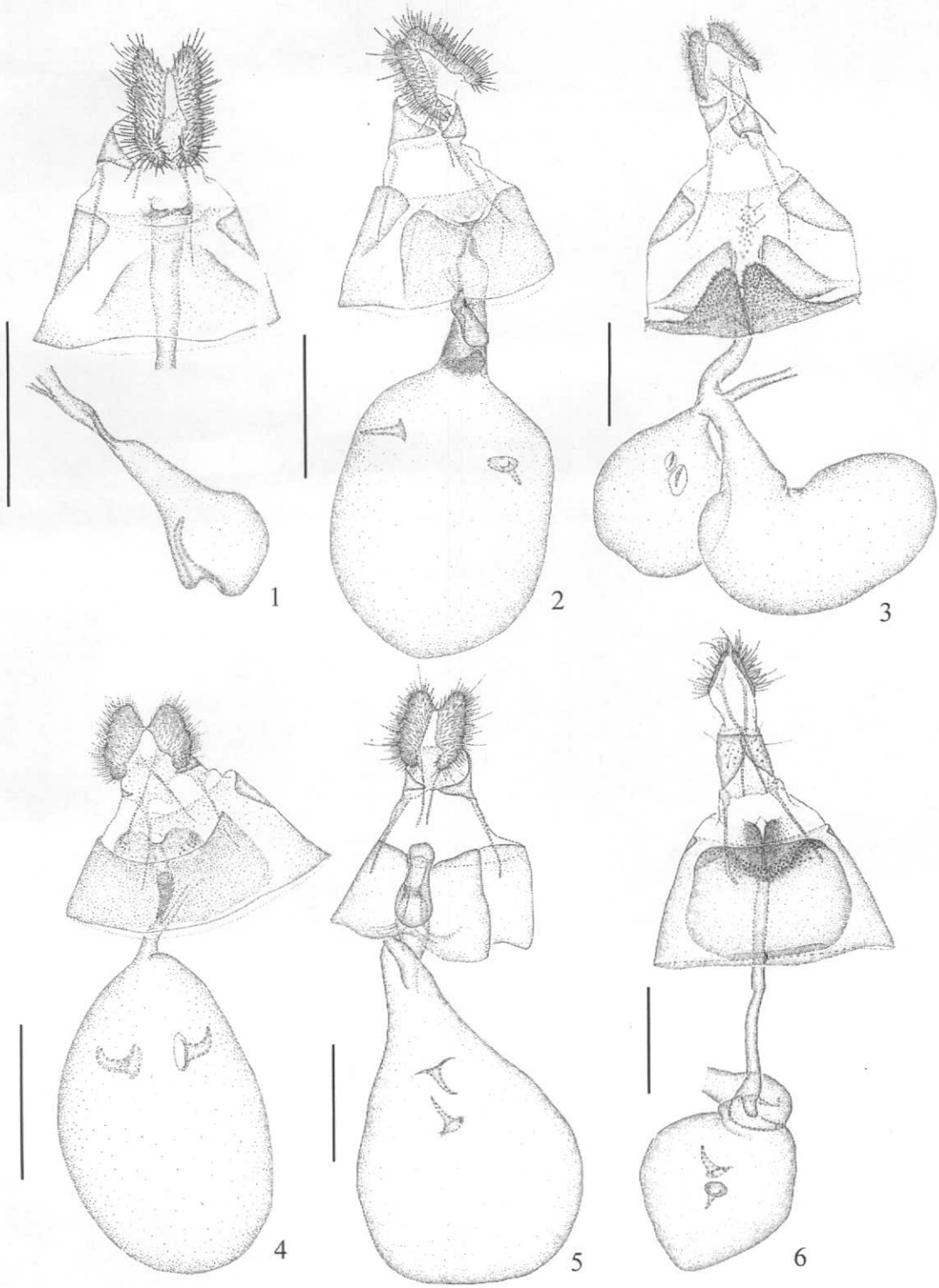

Figure 87 Female genitalia. 87.1. Enarmoniini genus H sp. A, NP624. 87.2. Enarmoniini genus J sp. A, NP637. 87.3. Enarmoniini genus L sp. A, NP705. 87.4. Enarmoniini genus N sp. A, NP 717. 87.5. *Acroclita lithoxoa* Diakonoff, NP451. 87.6. *Coniostola* sp. A, NP264. Scales = 0.5 mm.

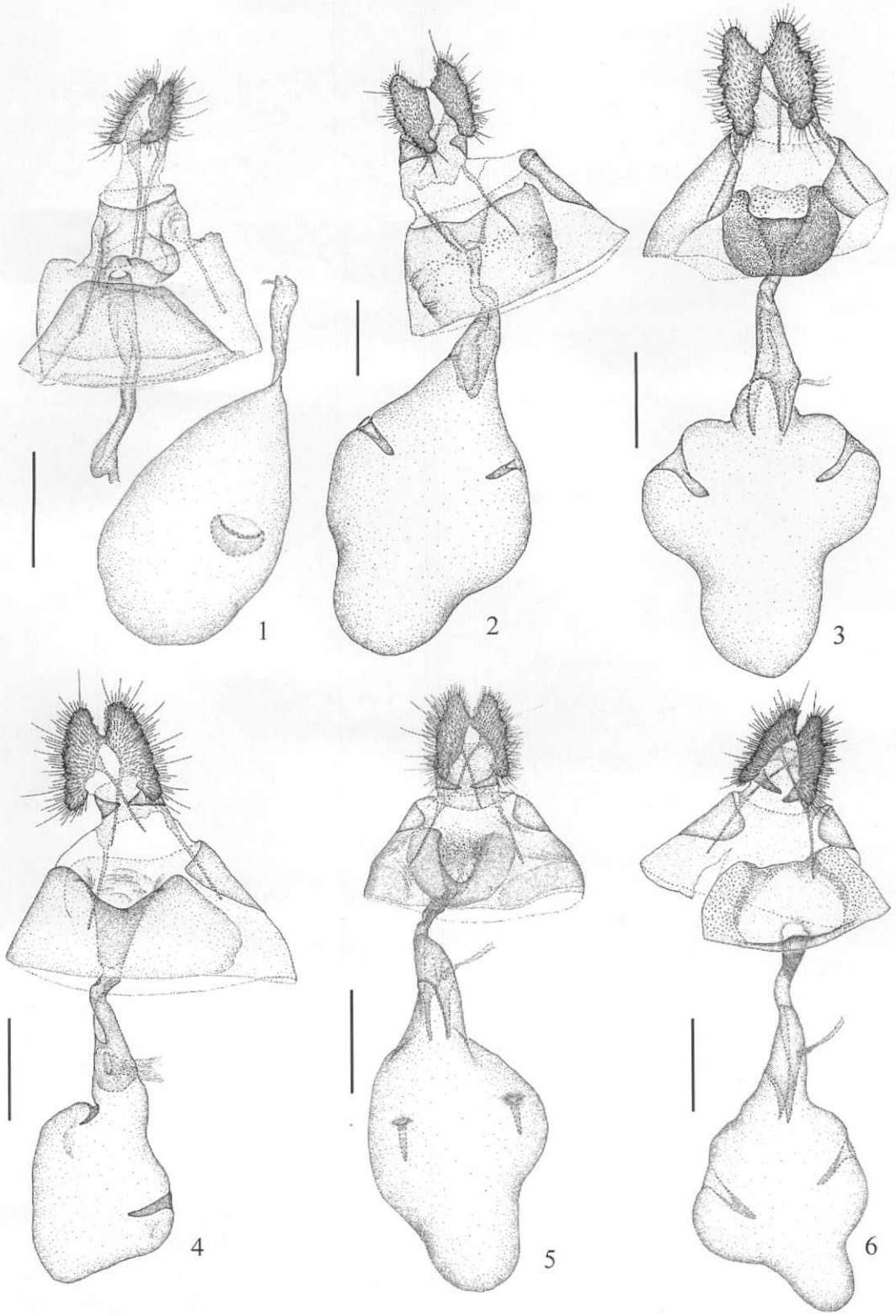

Figure 88 Female genitalia. 88.1. *Emrahia hoplista* (Meyrick), NP351. 88.2. *Eucoenogenes bicuculla* Pinkaew, NP141. 88.3. *E. munda* (Diakonoff), NP173. 88.4. *E. vaneeae* Pinkaew, NP463 88.5. *E.* sp. E, NP405. 88.6. *E.* sp. F, NP17. Scales = 0.5 mm.

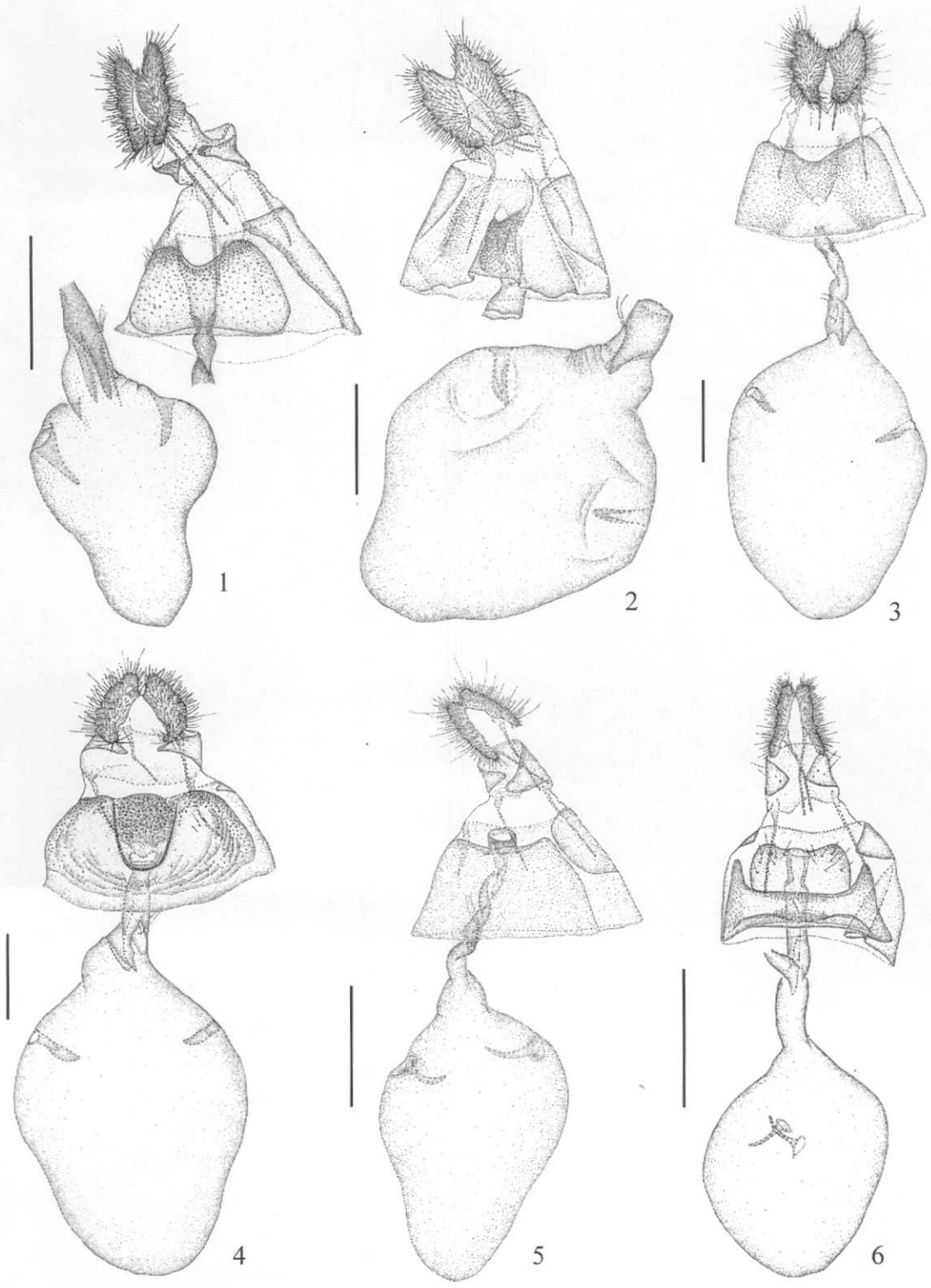

Figure 89 Female genitalia. 89.1. *Eucoenogenes* sp. G, NP366. 89.2. *E.* sp. H, NP116. 89.3. *E.* sp. I, NP115. 89.4. *E.* sp. J, NP484. 89.5. *Gypsonoma anthrasitis* Meyrick, NP484. 89.6. *G. infuscana* Kuznetsov, NP507. Scales = 0.5 mm.

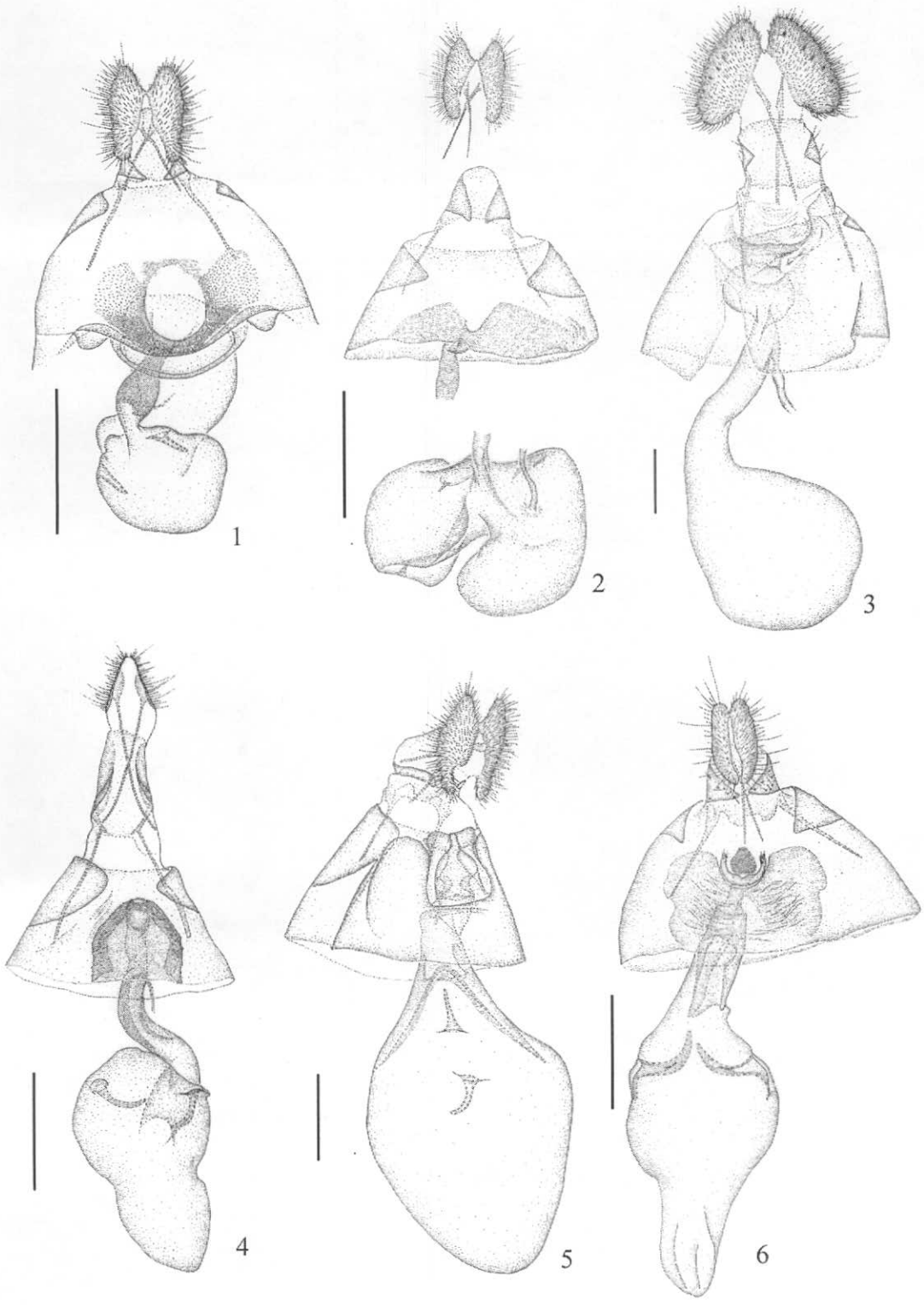

Figure 90 Female genitalia. 90.1. *Herpystis* sp. A, NP534. 90.2. *H.* sp. B, NP724. 90.3. *Mesocallyntera squamosa* Diakonoff, NP428. 90.4. *Peridaedala* sp. A, NP445. 90.5. *Rhopobota* sp. A, NP462. 90.6. *R.* sp. B, NP143. Scales = 0.5 mm.

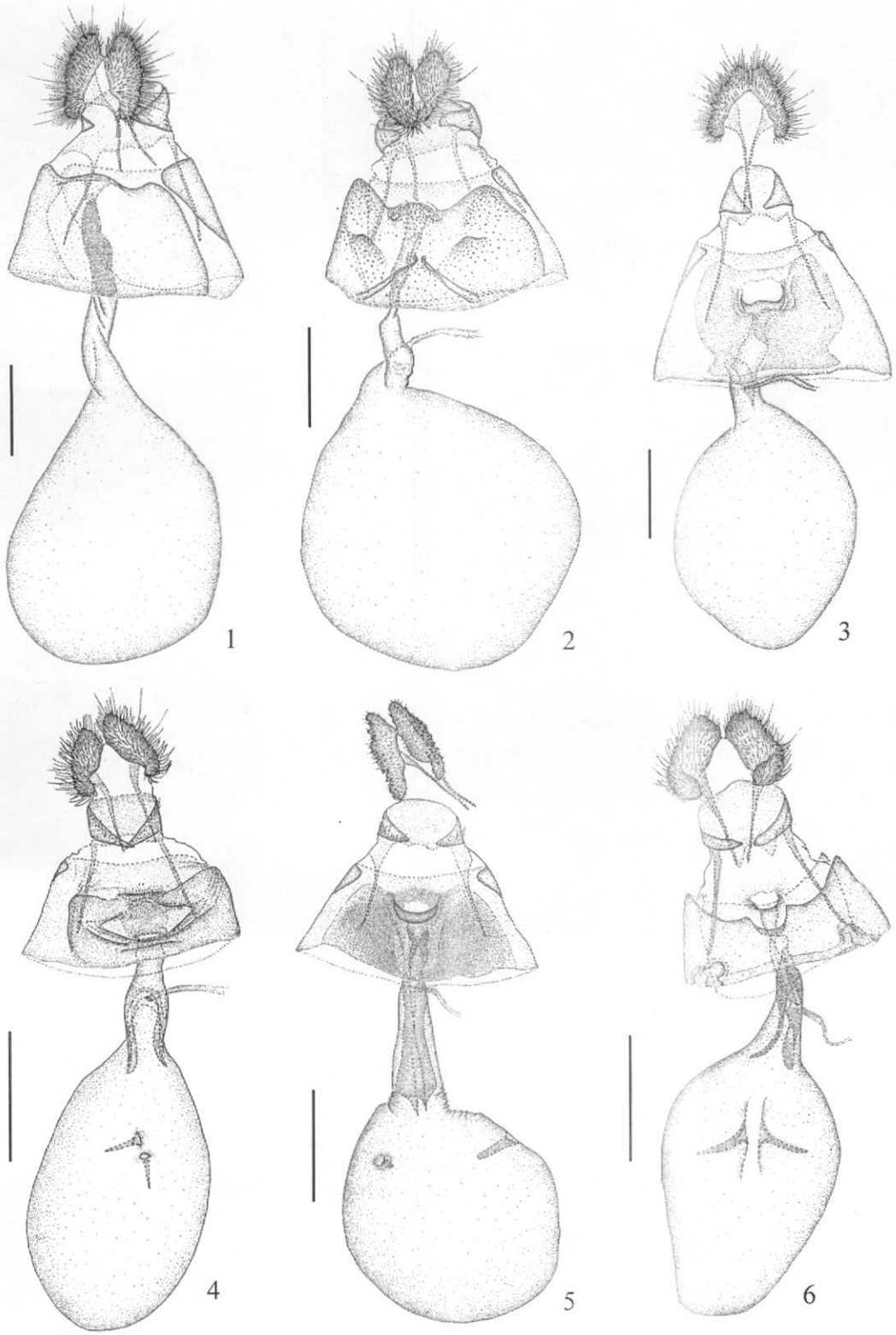

Figure 91 Female genitalia. 91.1. *Spilonota melanocopa* (Meyrick), NP481. 91.2. *S.* sp. A, NP453. 91.3. *Strepsicrates discobola* Diakonoff, NP535. 91.4. Eucosmini genus B sp. A, NP526. 91.5. Eucosmini genus C sp. A, NP40. 91.6. Eucosmini genus C sp. B, NP426. Scales = 0.5 mm.

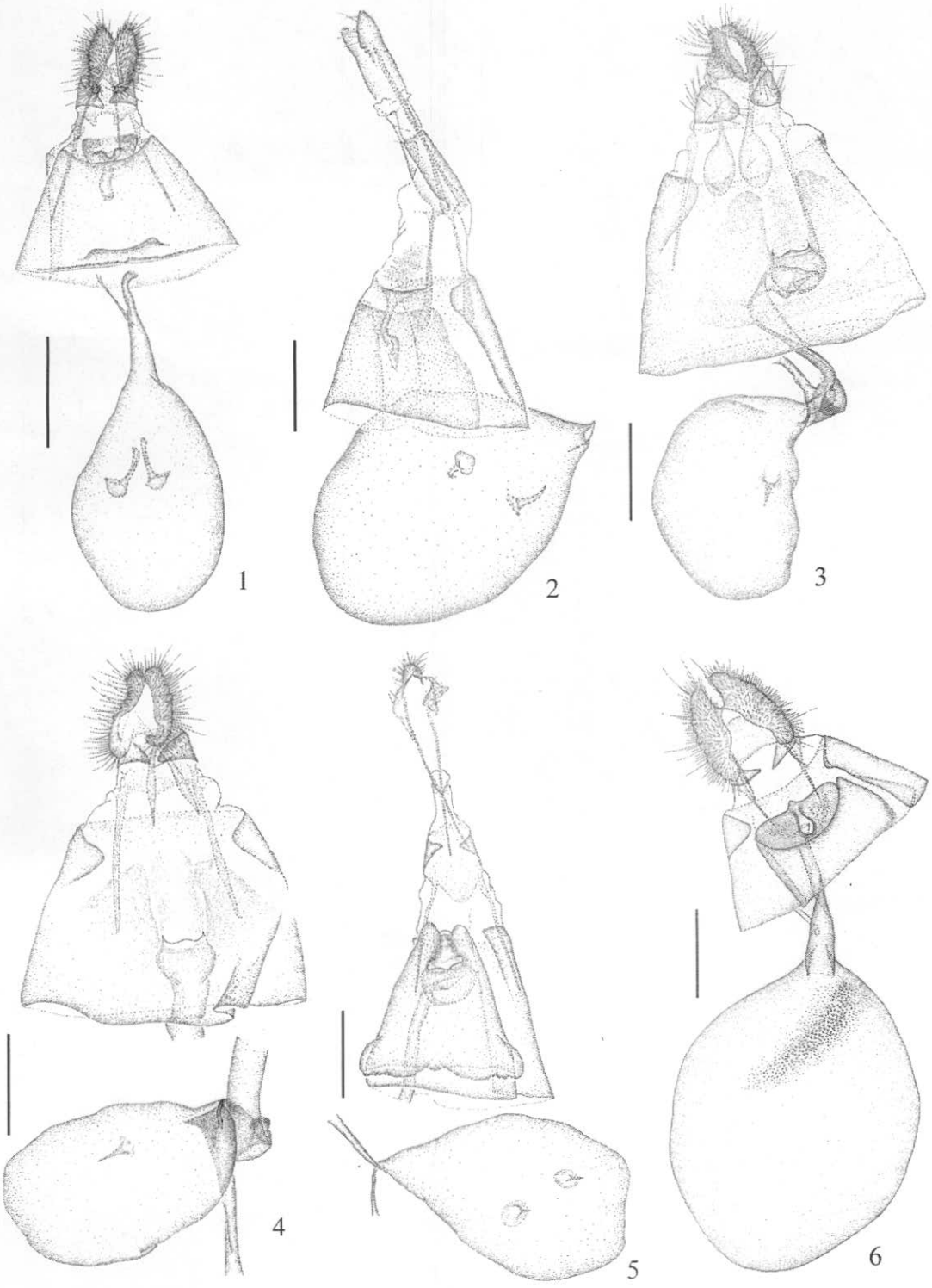

Figure 92 Female genitalia. 92.1. Eucosmini genus H sp. A, NP341. 92.2. Eucosmini genus I sp. A, NP315. 92.3. Eucosmini genus L sp. A, NP557. 92.4. Eucosmini genus L sp. B, NP560. 92.5. Eucosmini genus M sp. A, NP562. 92.6. Eucosmini genus O sp. A, NP193. Scales = 0.5 mm.

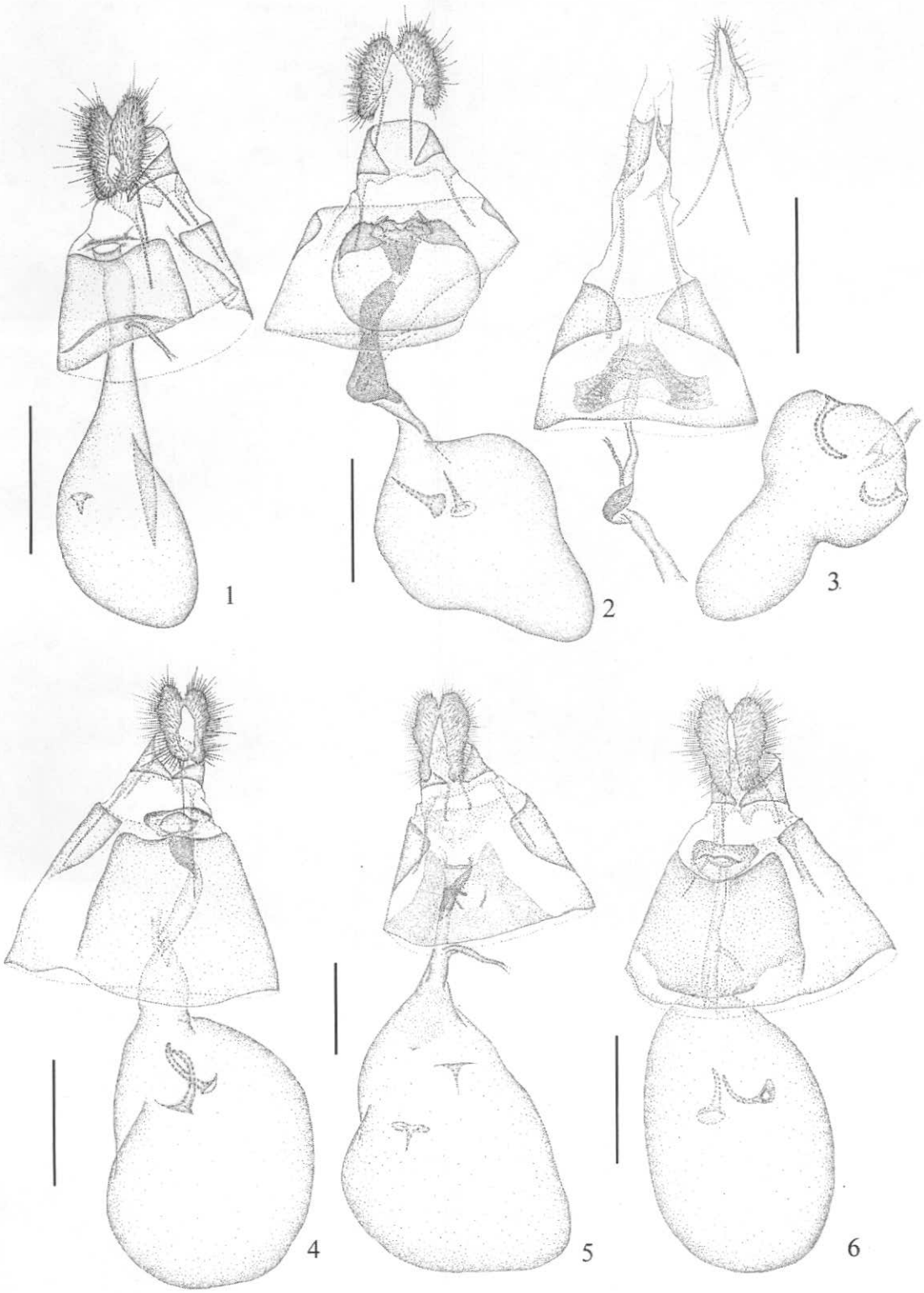

Figure 93 Female genitalia. 93.1. Eucosmini genus P sp. A, NP253. 93.2. Eucosmini genus Q sp. A, NP491. 93.3. Eucosmini genus R sp. A, NP659. 93.4. *Acanthoclita balanoptycha* (Meyrick), NP618. 93.5. *A. balia* Diakonoff, NP603. 93.6. *A.* sp. B, NP748. Scales = 0.5 mm.

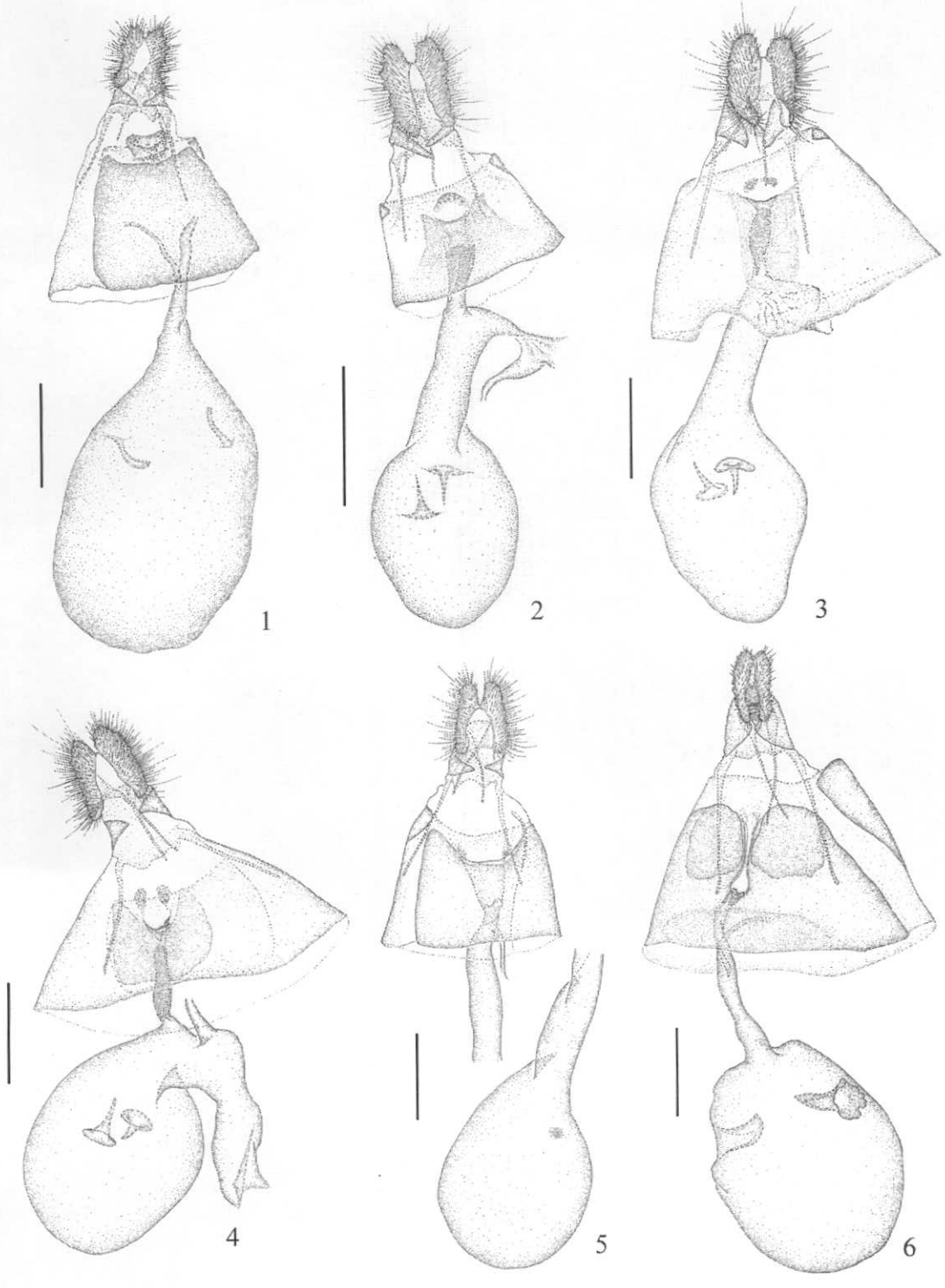

Figure 94 Female genitalia. 94.1. *Acanthoclita* sp. E, NP577. 94.2. *Andrioplecta dierli* Komai, NP662. 94.3. *A. shoreae* Komai, NP478. 94.4. *A. subpulverula* (Obraztsov), NP299. 94.5. *Cimeliomorpha cymbalora* (Meyrick), NP757. 94.6. *Cryptophlebia amblyopa* Clarke, NP84. Scales = 0.5 mm.

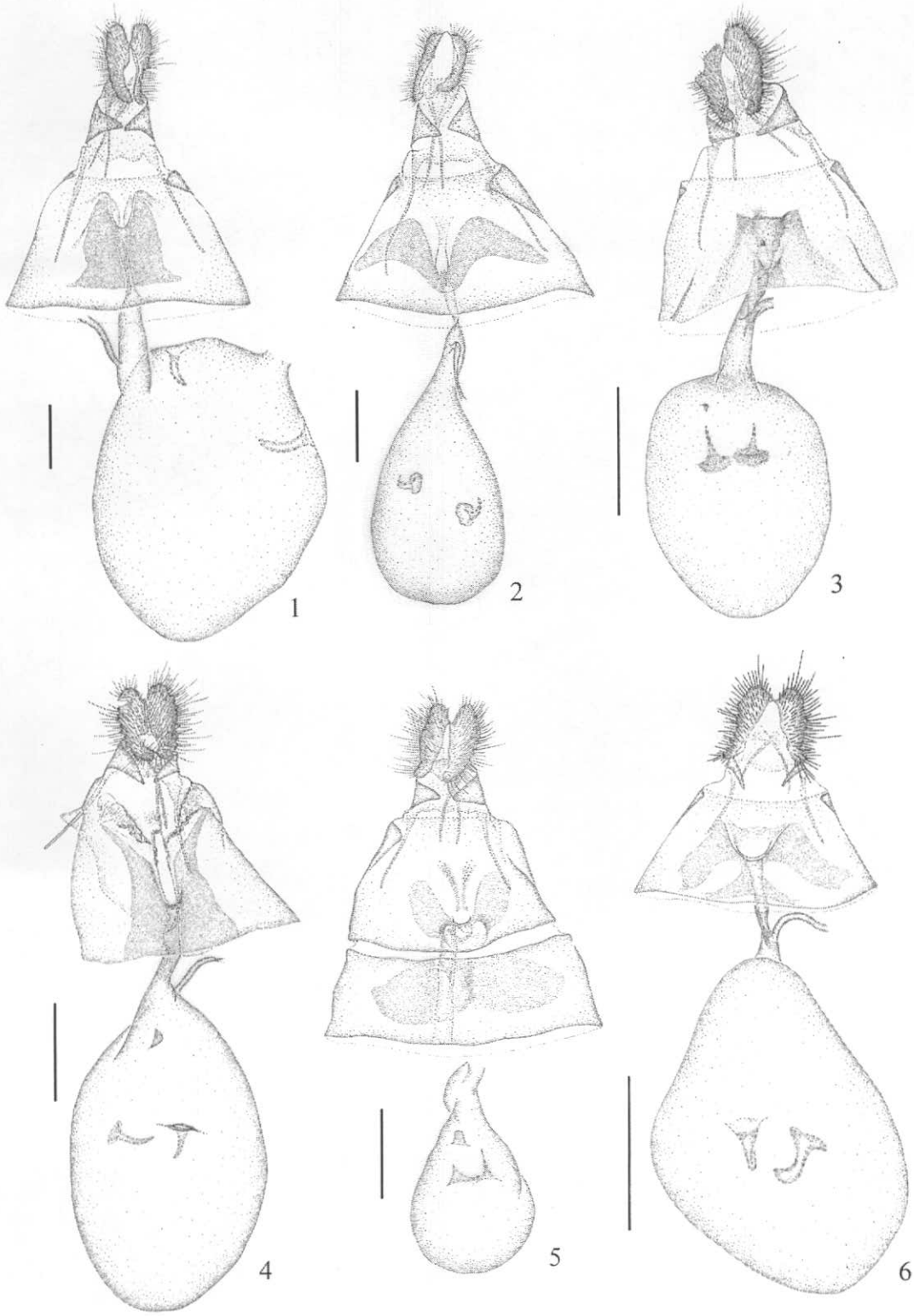

Figure 95 Female genitalia. 95.1. *Cryptophlebia ombrodelta* (Lower), NP644. 95.2. *C. repletana* (Walker), NP645. 95.3. *Cydia celiae* (Clarke), NP356. 95.4. *C. malesana* (Meyrick), NP398. 95.5. *C.* sp. A, NP572. 95.6. *Dierlia* sp. B, NP627. Scales = 0.5 mm.

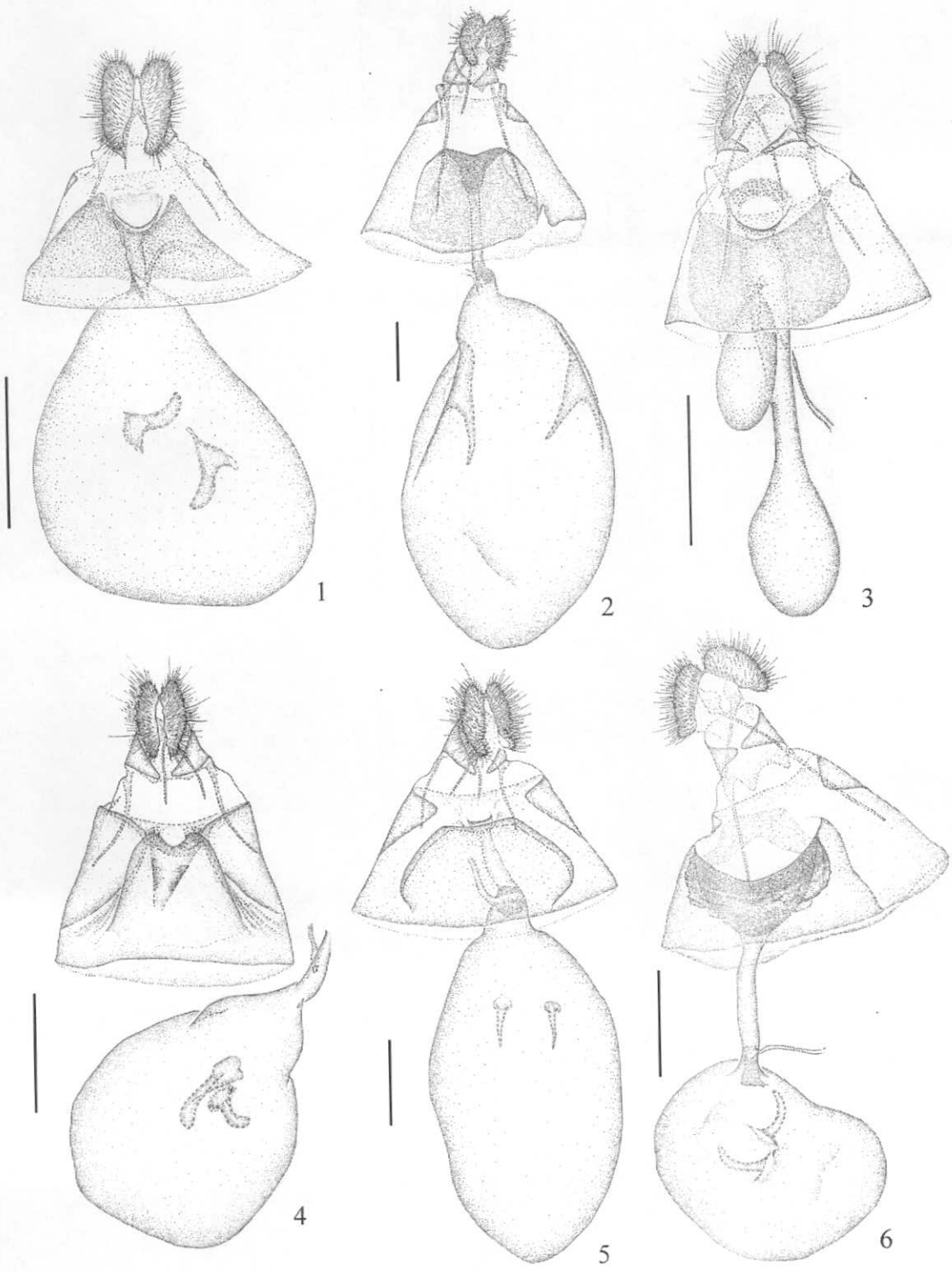

Figure 96 Female genitalia. 96.1. *Dierlia* sp. C, NP613. 96.2. *Grapholita seclusana* (Walker), NP250. 96.3. *G.* sp. B, NP684. 96.4. *G.* sp. C, NP319. 96.5. *G.* sp. D, NP474. 96.6. *G.* sp. E, NP340. Scales = 0.5 mm.

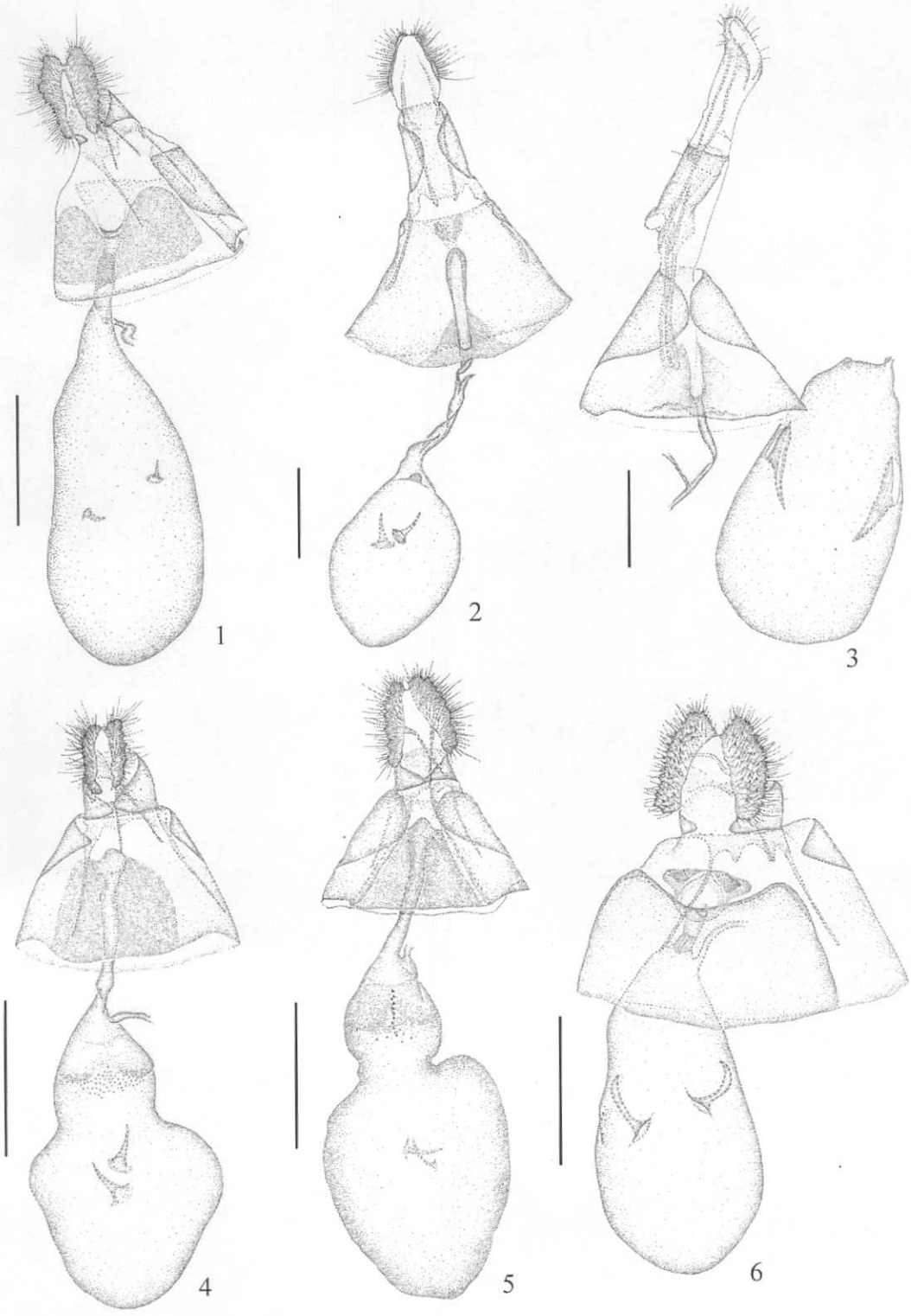

Figure 97 Female genitalia. 97.1. *Karacaoglania* sp. A, NP693. 97.2. *Leguminivora* sp. A, NP368. 97.3. *L.* sp. B, NP614. 97.4. *Microsarotis lucida* (Meyrick), NP383. 97.5. *M. palamedes* (Meyrick), NP609. 97.6. *Pammene* sp. C, NP349. Scales = 0.5 mm.

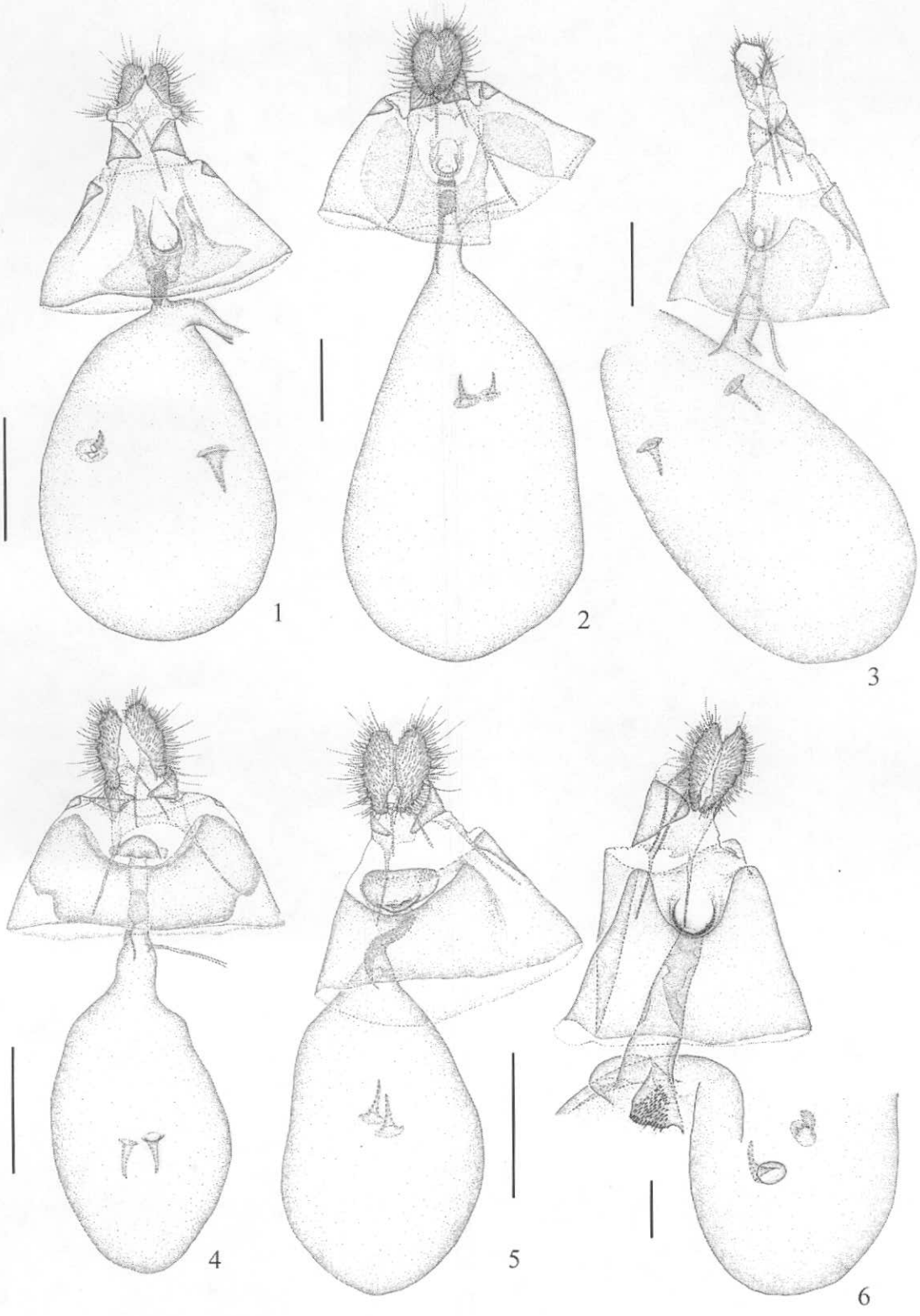

Figure 98 Female genitalia. 98.1. *Pammene* sp. D, NP571. 98.2. *Parapammene* sp. A, NP486. 98.3. *P.* sp. B, NP166. 98.4. *P.* sp. C, NP421. 98.5. *P.* sp. D, NP345. 98.6. *Procoronis swinhoeiana* (Walsingham), NP209. Scales = 0.5 mm.

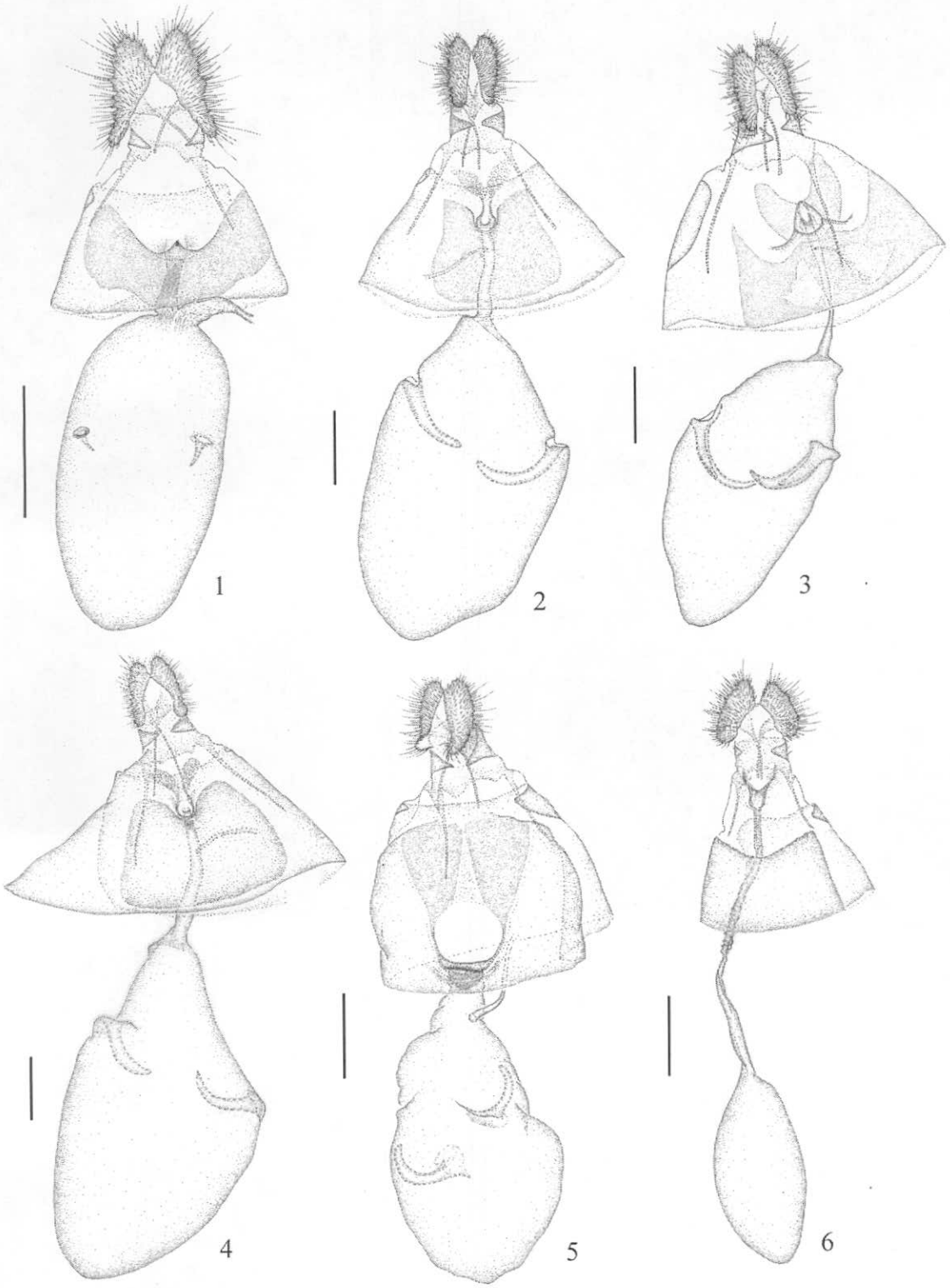

Figure 99 Female genitalia. 99.1. *Strophedra* sp. A, NP406. 99.2. *Thaumatotibia hemitoma* (Diakonoff), NP431. 99.3. *T.* sp. A, NP419. 99.4. *T.* sp. B, NP384. 99.5. Grapholitini genus C sp. A, NP411. 99.6. Grapholitini genus D sp. A, NP387. Scales = 0.5 mm.

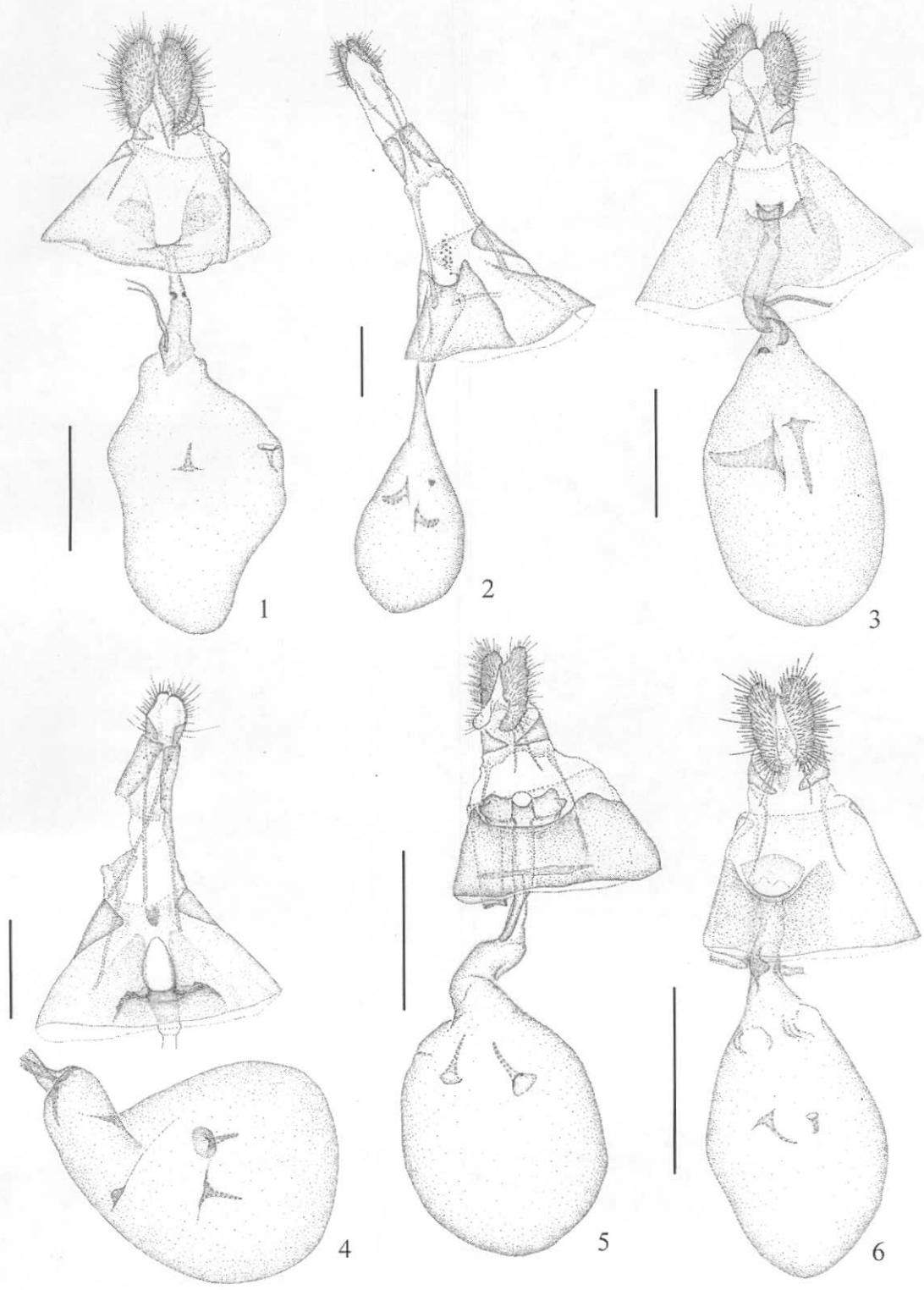

Figure 100 Female genitalia. 100.1. Grapholitini genus E sp. A, NP546. 100.2. Grapholitini genus F sp. A, NP512. 100.3. Grapholitini genus G sp. A, NP357. 100.4. Grapholitini genus H sp. A, NP262. 100.5. Grapholitini genus I sp. A, NP493. 100.6. Grapholitini genus J sp. A, NP625. Scales = 0.5 mm.

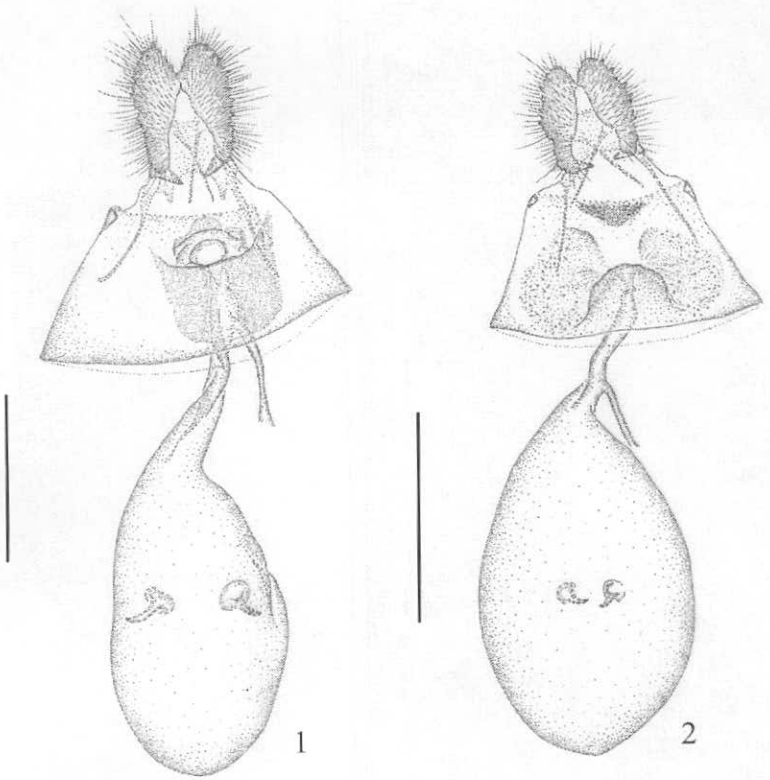

Figure 101 Female genitalia. 101.1. Grapholitini genus K sp. A, NP668. 101.2. Grapholitini genus L sp. A, NP714. Scales = 0.5 mm.

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APPENDIX

Appendix Table 1 Species list of Olethreutinae associated with habitat types

No	Species	Tribe	Habitat Types			Remarks
			H[1]	D[2]	M[3]	
1	*Gatesclarkeana idia* Diakakonff, 1973	Gatesclarkeanini	x	o	x	o
2	*Bactra cerata* (Meyrick)	Bactrini	x	o	o	o
3	*Bactra coronata* Diakonoff, 1950	Bactrini	x	o	x	o
4	*Bactra honesta* Meyrick, 1909	Bactrini	o	o	x	new record
5	*Bactra orbiculi* Diakonoff, 1966	Bactrini	x	o	o	new record
6	*Bactra venosana* (Zeller), 1847	Bactrini	x	o	x	o
7	*Bactra* sp. A	Bactrini	x	o	x	o
8	*Bactra* sp. B	Bactrini	x	o	x	o
9	*Bubonoxena ephippias* (Meyrick), 1907	Bactrini	o	x	o	o
10	*Bubonoxena spirographa* Diakonoff, 1968	Bactrini	x	x	o	new record
11	*Bubonoxena* sp. A	Bactrini	o	o	x	o
12	*Bubonoxena* sp. B	Bactrini	x	o	o	o
13	*Syntozyga pedias* (Meyrick), 1920	Bactrini	x	o	x	new recordo
14	*Apsidophora purpurorbis* Diakonoff, 1973	Olethreutini	x	o	o	o
15	*Arcesis anax* Diakonoff, 1983	Olethreutini	o	o	x	new record
16	*Archilobesia* sp. A	Olethreutini	x	o	x	o
17	*Argyroptocha phalaenopa* Diakonoff, 1968	Olethreutini	x	o	o	new record
18	*Balbidomaga* sp. A	Olethreutini	x	o	o	o
19	*Cymolomia phaeopelta* (Meyrick), 1921	Olethreutini	o	o	x	o
20	*Dactylioglypha pallens* Diakonoff, 1973	Olethreutini	x	o	x	new record
21	*Dactylioglypha tonica* (Meyrick), 1909	Olethreutini	x	o	o	o
22	*Dicephalarcha herbosa* (Meyrick), 1909	Olethreutini	x	o	o	o
23	*Dudua aprobola* (Meyrick), 1886	Olethreutini	x	o	x	o
24	*Dudua brachytoma* Diakonoff, 1973	Olethreutini	x	o	x	o
25	*Dudua charadraea* (Meyrick), 1909	Olethreutini	x	x	o	new record
26	*Dudua tetanota* (Meyrick), 1909	Olethreutini	x	o	x	o
27	*Gnathmocerodes* sp. A	Olethreutini	x	o	o	o
28	*Hoplitendemis* sp. A	Olethreutini	o	o	x	o
29	*Lobesia aeolopa* Meyrick, 1907	Olethreutini	x	o	x	o
30	*Lobesia genialis* Meyrick, 1912	Olethreutini	o	o	x	o
31	*Lobesia kurokoi* Bae, 1995	Olethreutini	o	o	x	o
32	*Lobesia lithogonia* Diakonoff, 1954	Olethreutini	x	o	x	o
33	*Lobesia* sp. A	Olethreutini	o	x	o	o
34	*Megalota fallax* (Meyrick), 1909	Olethreutini	o	o	x	new record
35	*Megalota vera* Diakonoff, 1966	Olethreutini	o	o	x	o
36	*Neohermenias thalassitis* (Meyrick), 1910	Olethreutini	x	o	o	new record
37	*Neohermenias* sp. A	Olethreutini	x	o	o	o
38	*Neopotamia cathemacta* Diakonoff, 1983	Olethreutini	x	o	o	new record
39	*Neopotamia formosa* Kawabe, 1989	Olethreutini	x	o	o	o
40	*Neopotamia* sp. A	Olethreutini	x	o	o	o
41	*Olethreutes* sp. A	Olethreutini	x	o	o	o
42	*Ophiorrhabda mormopa* (Meyrick), 1906	Olethreutini	x	o	o	o
43	*Ophiorrhabda philocompsa* (Meyrick), 1921	Olethreutini	x	x	o	o
44	*Penthostola albomaculatis* (Liu & Bai), 1985	Olethreutini	x	o	o	o
45	*Phaecadophora fimbriata* Walsingham, 1900	Olethreutini	x	x	x	o
46	*Phaecasiophora walsinghami* Diakonoff, 1959	Olethreutini	x	o	x	o
47	*Phaecasiophora* sp. A	Olethreutini	x	o	o	o
48	*Phaulacantha metamelas* Diakonoff, 1973	Olethreutini	x	o	o	o
49	*Rhodacra parvusa* Kawabe, 1995	Olethreutini	o	o	x	o
50	*Rhodacra pyrrhocrossa* (Meyrick), 1912	Olethreutini	x	o	o	o
51	*Semutophila saccaropa* Tuck, 1986	Olethreutini	o	o	x	new record
52	*Sisona albitibiana* (Snellen), 1902	Olethreutini	o	x	o	o

Appendix Table 1 (Cont'd)

No	Species	Tribe	Habitat Types			Remarks
			H[1]	D[2]	M[3]	
53	*Sorolopha archimedias* (Meyrick), 1912	Olethreutini	x	o	x	new record
54	*Sorolopha herbifera* (Meyrick), 1909	Olethreutini	x	o	o	o
55	*Sorolopha nagaii* Kawabe, 1989	Olethreutini	x	o	o	o
56	*Sorolopha plinthograpta* (Meyrick), 1931	Olethreutini	x	o	o	o
57	*Sorolopha semiculta* (Meyrick), 1909	Olethreutini	x	o	x	o
58	*Sorolopha sphaerocopa* (Meyrick), 1931	Olethreutini	x	o	o	o
59	*Sorolopha stygiaula* (Meyrick), 1933	Olethreutini	o	o	x	new record
60	*Sorolopha* sp. A	Olethreutini	x	o	o	o
61	*Sorolopha* sp. B	Olethreutini	x	o	o	o
62	*Statherotis discana* (Felder & Rogenhofer), 1875	Olethreutini	x	x	o	o
63	*Statherotis leucaspis* (Meyrick), 1902	Olethreutini	x	o	o	o
64	*Statherotis* sp. A	Olethreutini	o	o	x	o
65	*Statherotis* sp. B	Olethreutini	o	o	x	o
66	*Statherotis* sp. C	Olethreutini	x	o	o	o
67	*Statherotis* sp. D	Olethreutini	x	o	o	o
68	*Statherotoxys* sp. A	Olethreutini	x	o	o	o
69	*Sycacantha* sp. A	Olethreutini	o	o	x	o
70	*Sycacantha* sp. B	Olethreutini	x	o	x	o
71	*Sycacantha* sp. C	Olethreutini	x	o	o	o
72	*Sycacantha* sp. D	Olethreutini	x	o	o	o
73	*Sycacantha* sp. E	Olethreutini	x	o	o	o
74	*Sycacantha* sp. F	Olethreutini	o	o	x	o
75	*Teleta taralis* (Durrant), 1915	Olethreutini	x	o	o	o
76	*Temnolohpa matura* Diakonoff, 1973	Olethreutini	x	o	x	o
77	*Thysanocrepis crossota* (Meyrick), 1911	Olethreutini	x	o	o	o
78	Olethreutini genus A sp. A	Olethreutini	o	o	x	o
79	Olethreutini genus B sp. A	Olethreutini	x	o	o	o
80	Olethreutini genus C sp. A	Olethreutini	x	o	o	o
81	*Anathamna spermatophaga* Diakonoff & Bradley, 1976	Enarmoniini	o	o	x	new record
82	*Anathamna* sp. A	Enarmoniini	x	o	o	o
83	*Anathamna* sp. B	Enarmoniini	o	o	x	o
84	*Ancylis anthophanes* Meyrick, 1928	Enarmoniini	x	o	x	o
85	*Ancylis aromatias* Meyrick, 1912	Enarmoniini	x	o	o	o
86	*Ancylis celerata* Meyrick, 1912	Enarmoniini	x	o	o	new record
87	*Ancylis lutescens* Meyrick, 1912	Enarmoniini	o	o	x	new record
88	*Loboschiza koenigiana* Fabricius, 1775	Enarmoniini	x	o	x	new record
89	*Loboschiza* sp. A	Enarmoniini	o	o	x	o
90	*Tetramoera flavescens* Kuznetsov, 1988	Enarmoniini	o	o	x	new record
91	Enarmoniini genus A sp. A	Enarmoniini	o	x	o	o
92	Enarmoniini genus B sp. A	Enarmoniini	o	o	x	o
93	Enarmoniini genus C sp. A	Enarmoniini	x	o	o	o
94	Enarmoniini genus D sp. A	Enarmoniini	x	o	o	o
95	Enarmoniini genus E sp. A	Enarmoniini	x	o	o	o
96	Enarmoniini genus F sp. A	Enarmoniini	x	o	o	o
97	Enarmoniini genus G sp. A	Enarmoniini	x	o	x	o
98	Enarmoniini genus H sp. A	Enarmoniini	x	o	x	o
99	Enarmoniini genus I sp. A	Enarmoniini	o	o	x	o
100	Enarmoniini genus J sp. A	Enarmoniini	o	o	x	o
101	Enarmoniini genus K sp. A	Enarmoniini	o	o	x	o
102	Enarmoniini genus L sp. A	Enarmoniini	x	o	o	o
103	Enarmoniini genus M sp. A	Enarmoniini	x	o	o	o
104	Enarmoniini genus N sp. A	Enarmoniini	o	o	x	o

Appendix Table 1 (Cont'd)

No	Species	Tribe	Habitat Types			Remarks
			H[1]	D[2]	M[3]	
105	*Acroclita cheradota* Meyrick, 1912	Eucosmini	o	o	x	new record
106	*Acroclita lithoxoa* Diakonoff, 1950	Eucosmini	x	o	o	new record
107	*Acroclita macrosaris* (Meyrick), 1938	Eucosmini	x	o	o	o
108	*Acroclita nigrovenana* Kuznetsov, 1988	Eucosmini	x	o	x	new record
109	*Aemulatrix aequilibra* Diakonoff, 1982	Eucosmini	x	o	o	new record
110	*Assulella archaea* Dikonoff, 1983	Eucosmini	x	o	o	o
111	*Bipartivalva aquilana* Kuznetsov, 1988	Eucosmini	o	o	x	new record
112	*Coniostola* sp. A	Eucosmini	x	o	x	o
113	*Emrahia hoplista* (Meyrick), 1927	Eucosmini	o	x	x	new record
114	*Epinotia canthonias* (Meyrick), 1920	Eucosmini	x	x	x	new record
115	*Eucoenogenes bicuculla* Pinkaew, 2005	Eucosmini	x	o	o	new species
116	*Eucoenogenes cyanopsis* (Meyrick), 1912	Eucosmini	x	o	o	o
117	*Eucoenogenes munda* (Diakonoff), 1983	Eucosmini	x	o	o	new record
118	*Eucoenogenes vaneeae* Pinkaew, 2005	Eucosmini	x	o	o	new species
119	*Eucoenogenes* sp. A	Eucosmini	x	o	o	o
120	*Eucoenogenes* sp. B	Eucosmini	x	o	o	o
121	*Eucoenogenes* sp. C	Eucosmini	x	o	o	o
122	*Eucoenogenes* sp. D	Eucosmini	x	o	o	o
123	*Eucoenogenes* sp. E	Eucosmini	x	o	o	o
124	*Eucoenogenes* sp. F	Eucosmini	x	o	o	o
125	*Eucoenogenes* sp. G	Eucosmini	x	o	o	o
126	*Eucoenogenes* sp. H	Eucosmini	x	o	o	o
127	*Eucoenogenes* sp. I	Eucosmini	x	o	o	o
128	*Eucoenogenes* sp. J	Eucosmini	x	o	o	o
129	*Eucosma calligrapha* (Meyrick), 1912	Eucosmini	x	o	x	new record
130	*Eucosma mollita* (Meyrick), 1931	Eucosmini	o	o	x	new record
131	*Gypsonoma anthrasitis* Meyrick, 1912	Eucosmini	x	o	x	new record
132	*Gypsonoma infuscana* Kuznetsov, 1988	Eucosmini	x	o	x	new record
133	*Heleanna physalodes* (Meyrick), 1910	Eucosmini	x	o	x	new record
134	*Heleanna* sp. A	Eucosmini	o	o	x	o
135	*Hermenias pachnitis* Meyrick, 1912	Eucosmini	x	x	o	o
136	*Herpystis mica* Kuznetsov, 1988	Eucosmini	x	o	o	new record
137	*Herpystis* sp. A	Eucosmini	x	o	x	o
138	*Herpystis* sp. B	Eucosmini	x	o	o	o
139	*Herpystis* sp. C	Eucosmini	x	o	o	o
140	*Megaherpystis melanoneura* (Meyrick), 1912	Eucosmini	x	o	x	o
141	*Mesocallyntera squamosa* Diakonoff, 1959	Eucosmini	x	o	o	o
142	*Noduliferola niphada* (Diakonoff), 1984	Eucosmini	x	o	x	new record
143	*Pelochrista pollinaria* (Diakonoff), 1971	Eucosmini	x	o	o	new record
144	*Peridaedala* sp. A	Eucosmini	x	o	o	o
145	*Rhopobota antecellana* Kuznetsov, 1988	Eucosmini	x	o	x	new record
146	*Rhopobota symbolias* (Meyrick), 1912	Eucosmini	x	o	o	o
147	*Rhopobota* sp. A	Eucosmini	x	o	o	o
148	*Rhopobota* sp. B	Eucosmini	x	o	o	o
149	*Rhopobota* sp. C	Eucosmini	x	o	o	o
150	*Rhopobota* sp. D	Eucosmini	x	x	x	o
151	*Rhopobota* sp. E	Eucosmini	x	o	o	o
152	*Spilonota babylonica* Meyrick, 1912	Eucosmini	o	o	x	new record
153	*Spilonota melanocopa* (Meyrick), 1912	Eucosmini	x	x	x	o
154	*Spilonota* sp. A	Eucosmini	x	x	x	o
155	*Strepsicrates discobola* Diakonoff, 1968	Eucosmini	x	o	o	new record
156	*Tritopterna anachastopa* (Meyrick), 1934	Eucosmini	x	o	o	new record

Appendix Table 1 (Cont'd)

No	Species	Tribe	Forest Types			Remarks
			H[1]	D[2]	M[3]	
157	Eucosmini genus A sp. A	Eucosmini	o	x	o	o
158	Eucosmini genus B sp. A	Eucosmini	o	x	o	o
159	Eucosmini genus C sp. A	Eucosmini	x	o	o	o
160	Eucosmini genus C sp. B	Eucosmini	o	x	o	o
161	Eucosmini genus D sp. A	Eucosmini	x	o	o	o
162	Eucosmini genus E sp. A	Eucosmini	x	o	o	o
163	Eucosmini genus F sp. A	Eucosmini	x	o	o	o
164	Eucosmini genus G sp. A	Eucosmini	x	o	o	o
165	Eucosmini genus H sp. A	Eucosmini	o	x	o	o
166	Eucosmini genus I sp. A	Eucosmini	o	x	o	o
167	Eucosmini genus J sp. A	Eucosmini	o	x	o	o
168	Eucosmini genus K sp. A	Eucosmini	x	x	x	o
169	Eucosmini genus L sp. A	Eucosmini	x	o	x	o
170	Eucosmini genus L sp. B	Eucosmini	o	o	x	o
171	Eucosmini genus L sp. C	Eucosmini	x	o	x	o
172	Eucosmini genus L sp. D	Eucosmini	x	o	o	o
173	Eucosmini genus M sp. A	Eucosmini	x	o	o	o
174	Eucosmini genus N sp. A	Eucosmini	o	o	x	o
175	Eucosmini genus O sp. A	Eucosmini	x	o	o	o
176	Eucosmini genus P sp. A	Eucosmini	x	o	o	o
177	Eucosmini genus Q sp. A	Eucosmini	x	o	x	o
178	Eucosmini genus R sp. A	Eucosmini	x	o	o	o
179	Eucosmini genus S sp. A	Eucosmini	o	o	x	o
180	*Acanthoclita balanoptycha* (Meyrick), 1910	Grapholitini	x	o	x	new record
181	*Acanthoclita balia* Diakonoff, 1982	Grapholitini	x	o	x	new record
182	*Acanthoclita* sp. A	Grapholitini	o	o	x	o
183	*Acanthoclita* sp. B	Grapholitini	x	x	o	o
184	*Acanthoclita* sp. C	Grapholitini	x	o	x	o
185	*Acanthoclita* sp. D	Grapholitini	x	o	x	o
186	*Acanthoclita* sp. E	Grapholitini	x	o	x	o
187	*Acanthoclita* sp. F	Grapholitini	x	o	o	o
188	*Andrioplecta dierli* Komai, 1992	Grapholitini	o	o	x	new record
189	*Andrioplecta shoreae* Komai, 1992	Grapholitini	x	o	o	o
190	*Andrioplecta subpulverula* (Obraztsov), 1968	Grapholitini	x	o	o	new record
191	*Cimeliomorpha cymbalora* (Meyrick), 1907	Grapholitini	o	o	x	new record
192	*Cryptophlebia amblyopa* Clarke, 1976	Grapholitini	x	o	o	o
193	*Cryptophlebia ombrodelta* (Lower), 1989	Grapholitini	x	x	x	o
194	*Cryptophlebia repletana* (Walker), 1863	Grapholitini	x	o	x	o
195	*Cryptophlebia rhynchias* (Meyrick), 1905	Grapholitini	o	o	x	o
196	*Cydia celiae* (Clarke), 1976	Grapholitini	o	o	x	new record
197	*Cydia malesana* (Meyrick), 1920	Grapholitini	x	x	x	new record
198	*Cydia obumbrana* Kuznetsov, 1992	Grapholitini	o	o	x	new record
199	*Cydia* sp. A	Grapholitini	o	x	o	o
200	*Dichrorampha* sp. A	Grapholitini	o	x	o	o
201	*Dierlia* sp. A	Grapholitini	o	o	x	o
202	*Dierlia* sp. B	Grapholitini	x	o	o	o
203	*Dierlia* sp. C	Grapholitini	o	o	x	o
204	*Fulcrifera tricentra* (Meyrick), 1907	Grapholitini	o	o	x	new record
205	*Grapholita comanticosta* Kuznetsov, 1988	Grapholitini	x	o	o	new record
206	*Grapholita dysaethria* Diakonoff, 1982	Grapholitini	o	o	x	new record
207	*Grapholita seclusana* (Walker), 1866	Grapholitini	x	o	o	new record
208	*Grapholita* sp. A	Grapholitini	x	o	o	o

Appendix Table 1 (Cont'd)

No	Species	Tribe	Habitat Types			Remarks
			H[1]	D[2]	M[3]	
209	*Grapholita* sp. B	Grapholitini	x	o	x	o
210	*Grapholita* sp. C	Grapholitini	x	x	o	o
211	*Grapholita* sp. D	Grapholitini	x	x	o	o
212	*Grapholita* sp. E	Grapholitini	o	o	x	o
213	*Grapholita* sp. F	Grapholitini	x	o	o	o
214	*Karacaoglania* sp. A	Grapholitini	x	x	x	o
215	*Karacaoglania* sp. B	Grapholitini	x	o	o	o
216	*Leguminivora* sp. A	Grapholitini	x	o	o	o
217	*Leguminivora* sp. B	Grapholitini	x	o	x	o
218	*Microsarotis lucida* (Meyrick), 1916	Grapholitini	x	x	x	new record
219	*Microsarotis palamedes* (Meyrick), 1916	Grapholitini	x	o	x	new record
220	*Pammene* sp. A	Grapholitini	o	o	x	o
221	*Pammene* sp. B	Grapholitini	x	o	x	o
222	*Pammene* sp. C	Grapholitini	o	o	x	o
223	*Pammene* sp. D	Grapholitini	x	o	o	o
224	*Parapammene* sp. A	Grapholitini	x	o	o	o
225	*Parapammene* sp. B	Grapholitini	x	o	o	o
226	*Parapammene* sp. C	Grapholitini	x	o	o	o
227	*Parapammene* sp. D	Grapholitini	o	o	x	o
228	*Parapammene* sp. E	Grapholitini	x	o	o	o
229	*Procoronis swinhoeiana* (Walsingham), 1890	Grapholitini	x	o	o	new record
230	*Strophedra* sp. A	Grapholitini	x	o	o	o
231	*Strophedra* sp. B	Grapholitini	x	o	o	o
232	*Thaumatotibia hemitoma* (Diakonoff), 1976	Grapholitini	x	x	x	o
233	*Thaumatotibia* sp. A	Grapholitini	o	x	x	o
234	*Thaumatotibia* sp. B	Grapholitini	x	o	o	o
235	*Thaumatotibia* sp. C	Grapholitini	o	x	o	o
236	*Thaumatotibia* sp. D	Grapholitini	x	o	o	o
237	Grapholitini genus A sp. A	Grapholitini	o	o	x	o
238	Grapholitini genus B sp. A	Grapholitini	x	o	o	o
239	Grapholitini genus C sp. A	Grapholitini	x	o	o	o
240	Grapholitini genus D sp. A	Grapholitini	o	o	x	o
241	Grapholitini genus E sp. A	Grapholitini	x	o	o	o
242	Grapholitini genus F sp. A	Grapholitini	o	o	x	o
243	Grapholitini genus G sp. A	Grapholitini	o	o	x	o
244	Grapholitini genus H sp. A	Grapholitini	x	o	x	o
245	Grapholitini genus I sp. A	Grapholitini	o	o	x	o
246	Grapholitini genus J sp. A	Grapholitini	x	o	o	o
247	Grapholitini genus K sp. A	Grapholitini	o	o	x	o
248	Grapholitini genus L sp. A	Grapholitini	o	o	x	o
249	Grapholitini genus M sp. A	Grapholitini	o	o	x	o

[1] H = Hill evergreen forest

[2] D = Dry evergreen forest

[3] M = Mixed deciduous forest