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Thalassodes and related taxa of emerald moths in China (Geometridae, Geometrinae)

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Abstract

The Chinese group of *Thalassodes* and related taxa, including four genera and eighteen species is reviewed. Four new species are described: *Pelagodes paraveraria* **sp. nov.**, *Pelagodes bellula* **sp. nov.**, *Pelagodes simplvalvae* **sp. nov.**, *Pelagodes sinuspinae* **sp. nov.** The genus *Remiformvalva*, the species *Remiformvalva viridicaput*, *Orothalassodes floccosa* and *Pelagodes clarifimbria* are recorded for the first time from China. Descriptions and diagnoses of the genera and diagnoses for the species are provided. The female genitalia of *R. viridicaput* are described for the first time. Moths of all species are illustrated in colour and figures of the genitalia and the male eighth segment are provided.

Key words: *Thalassodes*, *Orothalassodes*, *Pelagodes*, *Remiformvalva*, new species

Introduction

Most members of the genera *Thalassodes* Guenée, 1858, *Orothalassodes* Holloway, 1996, *Pelagodes* Holloway, 1996 and *Remiformvalva* Inoue, 2006 have the following features: the wing colour is sea-green and semi-transparent; white transverse lines on both wings are weak to distinct but very narrow; the postmedial line is usually straight on the forewing, but angled on the hind wing; the outer margin of the hind wing is usually protruding on the M_3 end; the antenna is bipectinate and the rami are adpressed. However, it is very difficult to identify specimens to genera and species on these external similarities, without examining the genitalia. Additionally there is often problems with matching males and females, for often several almost identical species, of the genera are collected at the same locality in the same season.

These four genera are the members of the tribe Hemitheini (= Hemitheiti Holloway, 1996), and were formerly treated as only one, traditionally accepted genus, *Thalassodes*. Inoue (1961) established the tribe Thalassodini based on the genus *Thalassodes* and was followed by Hausmann (1996). Holloway (1996) studied the Bornean fauna of this group and subordinated Thalassodini with the Hemitheini together with the Thalerini, Comostolini, Hemistolini and Jodini. He removed many species from *Thalassodes* mainly based on the structures of the male genitalia and the eighth segment, and erected two new genera, *Orothalassodes* and *Pelagodes*. Afterwards, Inoue (2006) erected the fourth genus of the group, *Remiformvalva*. These four genera are widely distributed in the Indo-Pacific tropics, with a few species extending to Africa, Japan and North China.

Although no worldwide study of this group has yet been published, many species have been described in this group. For example, Guenée (1858) described four new species, Walker (1861) named six species from south-east Asia and Warren (1897a, 1897b, 1898, 1899, 1901, 1902, 1903, 1905, 1906, 1912) established 15 new species and one subspecies from south-west Pacific and Africa in the late nineteenth to early twentieth. Prout (1911, 1912, 1916a, 1916b, 1917a, 1917b 1919, 1922, 1925a, 1925b, 1926, 1928, 1933, 1934, 1937) described 23 species and one subspecies from south-east Asia, south-west Pacific and African regions in the early twentieth century. The following researchers have made most of the recent additions. Herbulot (1958, 1963, 1972, 1986) described five new species from Africa. Robinson (1968, 1975) added two new species from Fiji. Holloway (1977, 1979, 1996) estab-

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lished four new species from New Caledonia and 13 new species from Borneo. Galsworthy (1997) named one new species from Hong Kong and Sommerer (1997) brought one new species from Sumatra. Parsons *et al.* (1999) listed 93 species and subspecies in *Thalassodes*, *Orothalassodes* and *Pelagodes*. Inoue (1971, 1976, 1994, 2003, 2005, 2006) described 32 new species mainly from south-east Asia.

Comparatively less progress has been made on this group in China. Chu (1981), Zhu & Xue (1992), Xue (1992a, 1992b, 2001) and Han & Xue (2002) recorded four species in the chapters of several monographs. The most comprehensive work on this group in China is by Han & Xue (2011), in which ten species were included. However, in this work, only few to no Chinese specimens were recorded in several species.

This revision was enabled by the recent collection of many fresh specimens, especially during bi-annual expeditions to Hainan province from 2007 to 2010, where the tropical climate fosters rich biodiversity. This led to twelve species being recognized in the Hainan province and a total of nineteen species recognized in China. The purposes of this paper are: to provide a summarization of Chinese species in this group; to provide diagnostic characters for each genus and species; to describe four new species; to publish new records from China; to describe the female genitalia of *R. viridicaput*, and, to provide illustrations of external features and genitalia of Chinese species.

Material and methods

Specimens studied were mainly from the following sources: the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), the Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming, China (KIZCAS), the Natural History Museum, London, UK (BMNH), Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany (ZFMK) and Sir Anthony Galsworthy's collection (AG Coll.). More than 120 genital slides were prepared and examined by the authors in IZCAS, and 54 genital slides including 30 types were photographed and examined in BMNH. Terminology of the wing venation follows the Comstock-Needham System (Comstock 1918) and that of the genitalia is based on Pierce (1914), Sibatani *et al.* (1954), Klots (1970) and Nichols (1989). Photographs of the specimens were taken using various digital cameras. The digital images were enhanced and the plates compiled using Adobe® Photoshop® software.

Thalassodes Guenée, 1858

Thalassodes Guenée, 1858, *in* Boisduval & Guenée, *Hist. nat. Insectes* (Spec. gén. Lépid.), 9: 359. Type species: *Thalassodes pilaria* Guenée, 1858, by subsequent designation by Moore, 1887. SOCIETY ISLANDS: Tahiti Island.

Description. Head: Antenna of male bipectinate, adpressed, tapering and filiform at tip, filiform in female. Frons slightly projecting, rough-scaled. Labial palpus weak, third segment in female slightly elongate. Thorax: Hind tibia usually dilated in male, with hair-pencil and terminal extension; two pairs of spurs in both sexes. Wing pattern: Outer margin of both fore- and hind wings usually smooth, and usually distinctly angled at middle of hind wing, occasionally serrate on both wings (e.g. *T. zebrata* Warren, 1906 (Papua New Guinea)); inner margin of hind wing elongate. Apex of forewing pointed (especially so in *T. acutipennis* Prout, 1916b (Caroline Islands)) to blunt, that of hind wing protruding or rounded. Wings bluish green, semitransparent, diffused with whitish to pale green streaks. Forewing with costa yellowish or whitish; antemedial and postmedial lines indistinct, linear, slightly dentate or sinuous, the latter almost perpendicular to inner margin. Hind wing with postmedial line straight or sinuous at upper half, bending inwards at CuA_1, then wavy to inner margin. Submarginal line usually absent. Terminal line appearing as small dots on vein ends if present. Fringes yellowish white. Venter pale bluish green, streaks on dorsum discernible. Frenulum present. Venation: Discal cell shorter than 1/2 length of wings. Forewing with R_1 diverging from upper angle of cell or proximally, close to or connected with Sc; R_{2-5} shortly stalked with M_1, M_3 shortly stalked with CuA_1. Hind wing with Rs stalked with M_1, M_3 stalked with CuA_1; discocellulars oblique; 3A absent. Abdomen: Third sternite of male abdomen with pair of setal patches; eighth segment unmodified or slightly modified. Male genitalia: Uncus, socii slender, tapering, of similar length. Gnathos with median process long, narrow, pointed. Valva usually with pointed to tongue-like process (here named 'valva basal process'), often spined or scobinate, arising from near base of transtilla and sometimes near base of sacculus; harpe often present, appearing

as an oblique sclerotized band at the centre of the valva, usually forming small spur near the ventral margin of the valva, sometimes harpe bearing one to two, small to large processes; Sacculus expanded, margin often scobinate. Saccus broad, sometimes with a small mesal, cephalic process. Coremata usually present. Aedeagus slender; often with blunt cornutus on vesica; sometimes coecum penis considerably long, narrow. Female genitalia: Sterigma sclerotized. Ductus bursae short to long. Corpus bursae small, spherical to oval, with a bicornute signum.

Diagnosis. On wing pattern, typical *Thalassodes* are very close to *Pelagodes*, except that the hind wing outer margin is more strongly angled in *Thalassodes*. The hair-pencil and the terminal extension on the hind tibia in *Thalassodes*, which are characteristic for *Thalassodes*, are absent in *Pelagodes*, *Orothalassodes* and *Remiformvalva*. In the male genitalia, *Thalassodes* has many characteristic features, such as: well-developed valva basal process, in most species; the developed harpe, which is an oblique sclerotized band at the centre of the valva, sometimes bearing large process, or forming small spur near ventral margin; well-developed coremata; the relatively less modified eighth segment; and the setal patches on the third sternite. Some atypical species, *T. nivestrota* Warren, 1903 (Papua New Guinea), *T. zebrata* Warren, 1906 (Papua New Guinea), *T. viridifascia* Swinhoe, 1908 (Borneo), *T. effata* Prout, 1916b (Moluccas) and *T. interalbata* Prout, 1911 (Irian Jaya) have different wing patterns from the transverse lines being replaced by a broad greenish band.

Distribution. China, Japan, Oriental to Australia region, Africa.

Thalassodes immissaria Walker, 1861

Figs 1, 21, 40, 58, 84

Thalassodes immissaria Walker, 1861, *List Specimens lepid. Insects Colln Br. Mus*., 22: 553. Syntype(s) ♂, Ceylon [Sri Lanka].

Material examined. CHINA: Hunan (IZCAS): Hengshan, 25.VI.1981, coll. Li Jutao, 1♂; Liuyang, 20.XI.1984, 1♀. **Hainan** (IZCAS): Danzhou, South China University of Tropical Agriculture, 140–150 m, 15–17.V.2007, coll. Chen Fuqiang, 1♀; Baisha, Yinggeling, 434 m, 1–4.IV.2008, coll. Lang Songyun, 1♂5♀ (Slide No. 1203 (♂)); Baisha, Nankai, Nanmaola, 1261 m, 10, 12–14.V.2009, coll. Chen Fuqiang, Yan Keji, 5♂8♀ (Slide No. 1230 (♂), 1232 (♂), 1233 (♀)); Baisha, Hongkan Shuiku, 553 m, 3–5.V.2009, coll. Yan Keji, 2♂2♀ (Slide No. 1247(♂)); Wuzhishan, Shuiman, 730–900 m, 7–11.V.2007, coll. Han Hongxiang, Lang Songyun, 22♂5♀ (Slide No. 1191(♀), 1192(♂), 1193(♂), 1239(♂)); *ibidem*, 732 m, 8–9.XII.2007, coll. Li Jing, 1♀; *ibidem*, 730–900 m, 1.IV.2008, coll. Lang Songyun, 1♂; Wanning, Xinglong, 41 m, 21.III.2008, coll. Lang Songyun, 1♀; Lingshui, Diaoluoshan, 920 m, 2–5.V.2007, coll. Han Hongxiang, Lang Songyun, 5♂2♀ (Slide No. 1205(♂)); *ibidem*, 95 m, 10.XII.2007, coll. Li Jing, 1♂1♀ (Slide No. 1214(♂)); *ibidem*, 929 m, 11–12.XII.2007, coll. Li Jing, 1♀; *ibidem*, 30–31.III.2008, coll. Lang Songyun, 4♂9♀; Ledong, Jianfengling, Yulingu, 707 m, 21.V.2009, coll. Chen Fuqiang, 1♀. **Guangxi** (IZCAS): Longzhou, Nonggang, 330 m, 15.VI.2000, coll. Yao Jian, 1♂ (Slide No. 612). **Yunnan** (IZCAS): Wenshan, Malipo, Tianshengqiao, 1105 m, 5, 21–25.XI.2003, coll. Lu Shengxian, 3♀ (Slide No. 1261). **Hong Kong (AG Coll.):** Victoria peak, Hong Kong Island, 23.VIII. (G.42), 1♂. **INDONESIA** (BMNH): G. Rangkoenau, Paloe, W. Celebes, 1800 ft, XII.1936, (J.P.A. Kalis), Rothschild Bequest, B.M. 1939-1, 1♂ (Slide No. 4161); *ibidem*, 900 ft, XI.1936, 1♂; Sidaonta, Paloe, W. Celebes, 4500 ft, VI.1937, (J.P.A. Kalis), Rothschild Bequest, B.M. 1939-1, 1♀ (Slide No. 4153). **MALAYSIA** (BMNH): Sarawak, Kuching, Semengok, 3–9.II.1976, E.W. Classey, B.M. 1976-116, 1♂ (Slide No. 8685; figured specimen in *The Moths of Borneo* Part 9).

Diagnosis. *T. immissaria* can be distinguished from the other congeners by the male genitalia having a long, tongue-like valva basal process and a tongue-like harpe. Other similar species, for example *T. viridulus* Inoue, 2006 (Philippines), *T. yazakii* Inoue, 2006 (Sulawesi, Philippines) and *T. intaminata* Inoue, 1971 also have a long valva basal process. The harpe of the first two species have two processes, and the harpe of the last species is a horn-like or triangular sclerite instead of tongue-like. The aedeagus is slender as in *T. intaminata*, but the sclerotized posterior process is usually much more acute than that of *T. intaminata* (but also pointed in BMNH slide 17678). The cornutus is smaller than in *T. intaminata*. The posterior margin of the male eighth sternite is less excavated centrally than that of *T. intaminata* The corpus bursae is relatively small and much shorter than the ductus bursae. Whereas, in *T. intaminata*, the corpus bursae is of similar length to the ductus bursae. The frons is greyish reddish brown. The terminal line appears as brown dots on the vein ends as in *T. opalina* Butler, 1880.

Biology. Holloway (1996) and Parsons *et al.* (1999) recorded the food plants of *Thalassodes immissaria* as follows: Anacardiaceae: *Mangifera indica*; Myrtaceae: *Eucalyptus camaldulensis*; Sapindaceae: *Dimocarpus longan*, *Nephelium*; Lythraceae: *Lagerstroemia*. Hung *et al*. (2006) recorded *Thalassodes immissarius* Walker (a misspelling of *immissaria*) feeding on litchi (*Litchi chinensis*) and longan (*Dimocarpus longans*) in Taiwan, both of the Sapindaceae family.

Distribution. China (Hunan, Taiwan, Hainan, Hong Kong, Guangxi, Yunnan), Japan, India, Vietnam, Thailand, Sri Lanka, Malaysia, Indonesia.

Thalassodes intaminata Inoue, 1971

Figs 2, 22, 41, 59, 85

Thalassodes immissaria intaminata Inoue, 1971, *Bull. Fac. domest. Sci., Otsuma Wom. Univ.*, 7: 144, pl. 6, figs 49, 50. Holotype ♂, Japan: Okinawa, Shuri. (BMNH)
Thalassodes intaminata: Inoue, 2005, *Trans. lepid. Soc. Japan*, 56 (4): 280, figs 8–10, 17.

Material examined. Holotype (BMNH), ♂, **JAPAN:** Okinawa, Shuri, 1.IX.1965, coll. S. Kuniyoshi, Inoue Coll. B.M. 1992-71 (photograph examined). BMNH Geometridae Slide photographs examined, 3♂, Slide No. 17349 from Taiwan, 17347, 17678 from Luzon); 1♀, (Slide No. 17350).

Diagnosis. See under the previous species for comparison of genitalia. The adult is smaller than that of *T. immissaria* and *T. opalina*. The terminal line is absent but appears as small brown dots on vein ends in *T. immissaria* and *T. opalina*.

Distribution. China (Fujian, Taiwan), Japan, Thailand, Philippines, Indonesia (Sumatra).

Thalassodes maipoensis Galsworthy, 1997

Figs 3, 23, 42

Thalassodes maipoensis Galsworthy, 1997, *Mem. Hong Kong nat. Hist. Soc.*, 21: 130, text-fig. 3; pl. 1, fig. 22. Holotype ♂, China: Hong Kong, Maipo. (BMNH)

Material examined. Holotype (BMNH), ♂, **CHINA:** Hong Kong: Maipo Education Centre N.T., 31.VIII.1994, coll. R. C. Kendrick (Slide No. 19176); paratype (BMNH), Maipo, 1♀.

Diagnosis. The male genitalia are close to those of *T. depulsata* Walker, 1861 (Sulawesi, Borneo) for both having a small scobinate valva basal process, an almost quadrate sacculus, and a tongue-like harpe, which is smaller than in *T. immissaria*. However the harpe is much smaller in *T. maipoensis*, and bigger and rounded in *T. depulsata*. The posterior margin of the male eighth sternite is shallowly concave and arc-like, whereas it is more deeply concave in *T. depulsata*. *T. maipoensis* is different from other congeners by the lack of setal patches on the third sternite, and because the hind tibia is not dilated and lacks a hair-pencil and terminal extension.

Distribution. China (Hong Kong).

Thalassodes opalina Butler, 1880

Figs 4, 24, 43, 60, 86

Thalassodes opalina Butler, 1880, *Ann. Mag. nat. Hist.* (5) 6: 214. Holotype ♂, India: Darjeeling. (BMNH)
Thalassodes immissaria opalina: Prout, 1933, *in* Seitz, *Macrolepid. World* 12: 100, pl. 11i.
Thalassodes proquadraria: Han & Xue, 2002, *Forest Insects of Hainan Island*: 549. (*Nec* Inoue)

Material examined. Holotype (BMNH), ♂, **INDIA:** Darjiling, 79.57 (Slide No. 4119; photograph examined). **CHINA: Hainan** (IZCAS): Baisha, Hongkan Shuiku, 553 m, 3–5.V.2009, coll. Chen Fuqiang, Yan Keji, 4♀; Baisha, Nankai, Nanmaola, 1261 m, 10, 12–14.V.2009, coll. Chen Fuqiang, Yan Keji, 17♂8♀ (Slide No. 1229(♂), 1231(♂), 1259(♀)); Jianfeng, 13–15.IV.1980, coll. Zhang Baolin, 2♂1♀ (one labeled, 900 m, Slide No. 1263(♀));

ibidem, 9.VIII.1983, coll. Liu Yuanfu, 1♂; Ledong, Jianfengling, 934 m, 14–17.XII.2007, coll. Li Jing, 2♂ (Slide No. 1242, 1258); *ibidem*, 828 m, 24.III.2008, coll. Lang Songyun, 1♂. **Yunnan** (IZCAS): Xishuangbanna, Xiaomengyang, 1000 m, 3.IX.1957, coll. Wang Shuyong, 1♂(Slide No. 1252); Xishuangbanna, Damengyang, 650 m, 4.VIII.1958, coll. Zhang Yiran, 1♂. **Kouangsi (Guangxi)** (ZFMK): Région de Nanning, 1929, 2♂. **INDIA** (BMNH): Punjab, 1920-356, 1♂ (photograph examined).

Diagnosis. *T. opalina* is close to *T. opalinoides* Holloway, 1996 (Borneo) externally and on genitalia. On wing pattern, *T. opalina* lacks the distinctive feature that Holloway (1996) indicated for *T. opalinoides i.e.* — the ground colour grades darker towards the postmedial lines from the base and is abruptly paler just distal to them. In the male genitalia, *T. opalina* shares a spine-like valva basal process, a large blunt ampulla and a slender spine-like harpe with *T. opalinoides*. However in *T. opalinoides*, a scobinate, semicircular plate at the base of valva basal process is present. The sacculus is more strongly developed in *T. opalina* than in *T. opalinoides*, with a sclerotized and spinulose ventral margin. The aedeagus has a blunt posterior process and an acute cornutus, but both of these processes are acute in *T. opalinoides*. The male eighth sternite is identical to that of *T. opalinoides* in that the posterior margin is deeply rounded and concave, with two blunt protrusions. The female genitalia are almost identical to those of *T. opalinoides*. Both species bear a Y-shaped signum, which bears a tiny pointed process on the end of each branch. The lamella postvaginalis is a pair of sclerotized blunt protrusions, which are joined anteriorly.

Distribution. China (Taiwan, Hainan, Guangxi, Yunnan), India, Thailand.

Orothalassodes Holloway, 1996

Orothalassodes Holloway, 1996, *Malay. Nat. J.*, 49 (3–4): 259. Type species: *Thalassodes hypocrites* Prout, 1912, by original designation. SINGAPORE.

Description. Head: Identical to that of *Thalassodes*. Thorax: Hind tibia with two pairs of spurs in both sexes, not dilated, without hair-pencil and terminal extension in male. Wing pattern: Outer margin of both fore- and hind wings smooth or crenulated, sometimes slightly projecting at middle on hind wing, inner margin elongate. Apex of forewing pointed to blunt, that of hind wing slightly protruding, rounded. Wings bluish green (more bluish than *Thalassodes*), diffused with white striations. Forewing with antemedial line indistinct, postmedial line punctuated, composed of series of dots on veins, often enlarged, forming white patch on inner margin. Hind wing with postmedial line similar to that of forewing; sometimes with white discal spot. Fringes of both wings sometimes reddish, appearing as white dots on vein ends. Venter paler than dorsum, streaks on dorsum discernible. Venation identical to that of *Thalassodes*. Abdomen: Dorsal side often with small white patches. Third sternite of male abdomen lacking setal patches. Eighth segment modified: sternite very broad, often expanded laterally, with blunt process, concave at middle or occasionally with sclerotized process; tergite very narrow, bifurcate posteriorly. Male genitalia: Uncus sclerotized, narrow and long. Socii narrow, of similar length to uncus. Gnathos with median process tapering, pointed or blunt. Valva usually simple, with a weak longitudinal setal patch at middle near costa; occasionally with ampulla (e.g. *O. pervulgatus* Inoue, 2005). Juxta sometimes with serrated sclerite at lateral sides of posterior. Saccus semicircular or tongue-like. Coremata absent. Aedeagus sclerotized and usually blunt terminally; vesica wrinkled, with pointed to blunt cornutus. Female genitalia: Shape variable. Sterigma wrinkled, sclerotized. Ductus bursae very short to long, often broad and with lateral lobe. Corpus bursae small to very large; bicornute signum sometimes present.

Diagnosis. On wing pattern, *Orothalassodes* can be distinguished from other three genera (*Thalassodes*, *Pelagodes* and *Remiformvalva*) by the large white spot on the forewing postmedial line at the inner margin, or the white discal spot on the hind wing. Main characteristic features are in the modification of the eighth segment, which is more pronounced than in *Thalassodes*. Contrastingly the pair of slender lateral processes on the sternite and simple tergite in *Pelagodes* are absent in this genus. In the male genitalia, the usually simple valva is distinguishes the genus from the other three genera. In the female genitalia, the lateral lobe that is often present on the ductus bursae is also distinctive. However the narrow socii are similar to that of *Thalassodes* and the absence of setal patches on the third sternite and coremata is shared with *Pelagodes* and *Remiformvalva*.

Distribution. South-east Asia to South-west Pacific.

***Orothalassodes hypocrites* (Prout, 1912)**
Figs 5, 25, 44, 61, 87

Thalassodes hypocrites Prout, 1912, *in* Wytsman, *Genera Insectorum*, 129: 153. Holotype ♂, Singapore. (BMNH)
Orothalassodes hypocrites: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 259.

Material examined. Holotype (BMNH), ♂, **SINGAPORE:** H.N. Ridley, 1900-258 (Slide No. 8691). **CHINA: Hainan** (IZCAS): Baisha, Nankai, Nanmaola, 1261 m, 10.V.2009, coll. Chen Fuqiang, 1♀; Wuzhishan, Shuiman, 730–900 m, 7.V.2007, coll. Lang Songyun, 1♂; Lingshui, Diaoluoshan, 929 m, 11–12.XII.2007, coll. Li Jing, 1♀; Jianfengling, 14.V.1982, coll. Liu Yuanfu, 1♂. **Yunnan** (IZCAS): Luxi, 1200 m, 5.V.1980, coll. Li Hongxing, 1♂ (Slide No. 1185); Mengla, 16.IV.1982, coll. He Wan, 1♀ (ex. KIZCAS); Kunming, Huahongdong, 29.V.1974, coll. Sun Shaorong, 1♀ (ex. KIZCAS, Slide No. 1296); Xishuangbanna, Bubeng, 700 m, 14.IX.1993, coll. Yang Longlong, 1♂. **Hong Kong (AG Coll.):** Victoria Peak, Hong Kong Island, 13.VI.1993, 1♀. **INDIA** (BMNH): Pirmad, Travancore, R.S. Imray, 1902-238, 1♂; Khasis, XII.1896, Nat. Coll, Rothschild Bequest, B.M. 1939-1, 1♂; Khasis, Nat. Coll, Ex. Oberthür Coll. Brit. Mus. 1927-3 (other labels: *Thalassodes albomaculata* Hamps. Hl. Het. IX. 14g, pl. 170.19), 1♂; Khasia Hills, Assam, Nissary, Det. by L.B. Prout, Joicey Bequest, Brit. Mus. 1934-120, 1♂ (Slide No. 8698); Cherrapunji, XI.1893, Assam, Rothschild Bequest, B.M.1939-1 (other labels: *Thalassodes hypocrites* Prout ♂, Seitz. 11k; *albomaculata* Hampson), 1♂; Sikkim, VII.1909, F. Moller, 1910-140, 1♂; Gopaldhara, Darjeeling, 4720 ft (H. Stevens), VII.1918, Rothschild Bequest, B.M. 1939-1, 1♀. **INDONESIA** (BMNH): 49.24, Lebong Tandai, Benkoalen, Sumatra, VII.1922, C.J. Brooks, Joicey Bequest, Brit. Mus. 1934-120, 1♀ (Slide No. 17867); **MALAYSIA** (BMNH): PAHANG, F.M.S., Lubok Tamang, 3500 ft, 10.VI.1923, H.M. Pendlebury, L.B. Prout Coll. B.M. 1939-643, ex coll. F.M.S. Museum, 1♂ (Slide No. 8697); Perak, F.M.S. Batang Padang. Jor Camp, 1800 ft, 5.III.1924, H.M. Pendlebury, L.B. Prout Coll. B.M. 1939-643, ex coll. F.M.S. Museum, 1♂ (Govrmt. Hill, Penang, 22.III.[18]98, 1000 ft, (Curtis), Rothschild Bequest, B.M. 1939-1, 1♂; Site 25, April, G. Api 900 m, 427550 Lower montane forest MV and Act, SARAWAK: Gunong Mulu Nat. Park, R.G.S. Exped. 1977-8, J.D. Holloway *et al*., B.M. 1978-206, 1♂ (Slide No. 16737).

Diagnosis. On wing pattern, *O. hypocrites* shares the white spot on the forewing inner margin with *O. retaka* Holloway, 1996 (Borneo), *O. vivida* (Prout, 1922) (Moluccas) and *O. leucospilota* (Moore, 1887) (Sri Lanka). The fringes are reddish brown, with white spots on the vein ends. Apomorphies of the male genitalia of these four species are, a densely hairy and spinose subcostal area on a simple valva, and a pair of spinose processes posterior to the juxta. However the valva of *O. retaka* is much broader than in the other three species. Additionally the processes associated with the juxta are of even width in *O. hypocrites*, slightly curved in *O. leucospilota*, expanded posteriorly in *O. vivida* and very broad in *O. retaka*. There are also differences in the male eighth abdominal segment: the tergite is Y-shaped in *O. retaka*; widely Y-shaped in *O. vivida*; a relatively wider cleft in *O. hypocrites*, which is more strongly excavated in *O. leucospilota*; the sternite protrudes with a blunt mesal process in the distal margin in *O. hypocrites*; in *O. vivida* and *O. leucospilota* the sternite has two mesal processes; in *O. retaka* the sternite bears a cleft. The female genitalia have an oval lamella postvaginalis and wrinkled lamella antevaginalis. The ductus bursae is very broad and sclerotized, bearing a rounded lateral lobe. The corpus bursae is of similar length to the ductus bursae. The signum is bicornute.

Distribution. China (Hainan, Hong Kong, Yunnan), India, Vietnam, Thailand, Malaysia, Singapore, Indonesia.

***Orothalassodes floccosa* (Prout, 1917a)**
Figs 6, 7, 26, 45, 62, 88

Thalassodes floccosa Prout, 1917a, *Ann. Mag. nat. Hist.* (8) 20: 121, pl. 7, fig. 4. Syntype(s) ♂, Peninsular Malaysia. Province Wellesley. (BMNH)
Orothalassodes floccosa: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 260.
Thalassodes immissaria opalina: Han & Xue, 2002, *Forest Insects of Hainan Island*: 549. (*Nec* Butler)

Material examined. CHINA: Hainan (IZCAS): Wuzhishan, Shuiman, 730–900 m, 8–9.V.2007, coll. Han Hongxiang, Lang Songyun, 2♂ (Slide No. 1184); Diaoluoshan, 8.V.1984, coll. Gu Maobin, 1♂; Lingshui, Diaoluoshan, 920 m, 2–3.V.2007, coll. Han Hongxiang, Lang Songyun, 4♀; *ibidem*, 929 m, 11–12.XII.2007, coll. Li Jing, 1♀;

ibidem, 916 m, 31.III.2008, coll. Lang Songyun, 1♂; Jianfengling, 12.XI.1981, coll. Gu Maobin, 2♀ (Slide No. 613); *ibidem*, 21.X.1982, coll. Wang Chunling, 1♀.

Diagnosis. *O. floccosa* is distinctive by the long and dense reddish brown scales on the hind leg, and the basal half of the hind wing in the males. *O. floccosa* has a simple valva as in *O. hypocrites* and related species mentioned under that species, but the valva is much shorter, the costal length is also relatively short (less than the saccus length). But in *O. hypocrites* and other close related species the costa is longer than the saccus . The male genitalia resemble those of *O. glabrosa* Holloway, 1996 (Borneo; BMNH Slide No. 16747) and *O. simplex* (Warren, 1912) (Sulawesi, Seram, Irian Jaya); but *O. glabrosa* and *O. simplex* lack any sclerites related to the juxta, which are present but small and blunt in *O. floccosa*. The eighth sternite is quite different from other congeners. It is deeply concave mesally in *O. floccosa*, but only shallowly excavated in *O. glabrosa*. The female genitalia are distinctive in having two finger-like lateral lobes at the juncture of the ductus bursae and the corpus bursae.

Distribution. China (Hainan), Philippines, Malaysia, Indonesia.

Orothalassodes pervulgatus Inoue, 2005

Figs 8, 27, 46, 63, 89

Orothalassodes pervulgatus Inoue, 2005, *Trans. lepid. Soc. Japan*, 56 (4): 284, fig. 5–6, 13, 18. Holotype ♂, India: Darjeeling. (BMNH)

Material examined. CHINA: Hainan (IZCAS): Wanning, Xinglong, 41 m, 21.III.2008, coll. Lang Songyun, 1♀; Jianfeng, 15.IV.1980, coll. Zhang Baolin, 1♂ (Slide No. 1237). **Guangxi** (IZCAS): Shangsi, Hongqi Linchang, 350 m, 29.V.1999, coll. Li Wenzhu, 1♂; Fangcheng, Banba, 350 m, 4.VI.2000, coll. Li Wenzhu, 1♂; Fangcheng, Fulong, 500 m, 24.V.1999, coll. Liu Dajun, 1♂; Napo, Defu, 1350 m, 18, 19.VI.2000, coll. Li Wenzhu, Yao Jian, 3♂ (Slide No. 1220). **Sichuan** (IZCAS): Dukou, 2150 m, 21–22.VIII.1980, coll. Zhang Baolin, 2♂3♀; Dukou, Pingdi, 1900 m, 23.VIII.1980, coll. Han Yinheng, 1♀; Xichang, 29.VI.1980, coll. Zhang Baolin, 1♂. **Yunnan** (IZCAS): Tengchong, Dahaoping, 2000 m, 24–26.V.1992, coll. Xue Dayong, 1♂; Ruili Dengga, 980 m, 6–8.VII.1992, coll. Xue Dayong, 1♂ (Slide No. 1250); Baoshan, Bawan, 1100 m, 19–23.V.1992, coll. Xue Dayong, 7♂1♀; *ibidem*, 1040 m, 8–10.VIII.2007, coll. Lang Songyun, 1♂; Baoshan, Baihualing, 1520 m, 11–13.VIII.2007, coll. Wu Chunguang, Lang Songyun, 8♂5♀ (Slide No. 1228(♂), 1291(♀)); Qujing, 7.VII.1982, coll. Song Shimei, 1♂ (Slide No. 1260); Longkou, 1200 m, 26.VI.1970, 1♂ (Slide No. 1251); Yuxi, Xiaoshiqiao, 22.IX.1975, coll. Gan Yunxing, 1♂ (ex. KIZCAS, Slide No. 1264); Mile, 4.VIII.1982, coll. Liang Xingcai, 1♀ (ex. KIZCAS); Jinggu, 18.VII.1981, coll. Lu Huaping, 1♂ (ex. KIZCAS). **Tibet** (IZCAS): Mêdog, Yarang, 1091 m, 20–23.VIII.2006, coll. Lang Songyun, 9♂1♀ (Slide No. 1199(♂), 1257(♂), 1292(♀)) ; Bomi, Yigong, Tongmai, 2079 m, 29–30.VIII.2006, coll. Lang Songyun, 1♀; Zayü, Xiazayü, 1534 m, 26.VIII.2005, coll. Wang Xuejian, 1♂(Slide No. 1221); Zayü, Shangzayü, 1960 m, 22.VIII.2005, coll. Wang Xuejian, 1♂; Zham Kou'an, 13.VIII.1981, coll. Hu Shengchang, 1♂2♀; Zham, 21.VII.1984, coll. Hu Shengchang, 1♂; Nyalam, Zham, 2250 m, 20.IV., 12.V.1974, coll. Zhang Xuezhong, 2♂ (Slide No. 1197).

Diagnosis. *O. pervulgatus* is externally similar to *O. falsaria* Prout, 1912, but is much greener than the latter species, which is much more bluish. In the male genitalia, *O. pervulgatus* is distinct in *Orothalassodes* by the long dentate ventral margin of the sacculus and the blunt ampulla. The paired basal processes associated with the juxta are present. The tiny mesal, cephalic protrusion is absent in the saccus. The aedeagus has a small pointed cornutus and a blunt lateral lobe. The tergite and sternite of the male eighth segment are deeply concave, the former is much narrower, and the latter is broader, with two long lateral anterior processes. The female genitalia have a small oval lamella postvaginalis with a pair of slightly sclerotized rounded processes, and a well sclerotized margin. The ductus bursae is very long, longer than the length of the corpus bursae. The corpus bursae is rounded, and without a signum.

Distribution. China (Taiwan, Hainan, Guangxi, Sichuan, Yunnan, Tibet), NE India, Nepal, Pakistan, Vietnam, Thailand, Philippines (Luzon).

Orothalassodes falsaria (Prout, 1912)

Figs 9, 28, 47, 64

Thalassodes falsaria Prout, 1912, *in* Wytsman, *Genera Insectorum*, 129: 153. Holotype ♂, India: Khasi Hills. (BMNH)
Thalassodes griseifimbria Prout, 1937, *Novit. zool*., 40: 179. Syntypes 2♂, Bali (east): Batoeriti. (BMNH)
Pelagodes falsaria: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 265.
Orothalassodes falsaria: Inoue, 2005, *Trans. lepid. Soc. Japan* 56 (4): 281, figs 3–4, 12, 15.

Material examined. Holotype (BMNH), ♂, **INDIA:** Khasis, Nat. Coll., L.B. Prout Coll., B.M. 1939-643 (Slide No. 4091; other labels: "*Thalassodes falsaria* Prout, Gen. Ins. Hem, p. 153, type"). Syntype of *Thalassodes griseifimbria*. **INDONESIA** (BMNH): Batoeriti, E. Bali, 3500 ft, VI.1935, (J.P.A. Kalis), Rothschild Bequest, B.M.1939-1 (Slide No. 4090; other labels "*Thalassodes griseifimbria* Prout, type") 1♂. **CHINA: Hainan** (IZCAS): Baisha, Nankai, Nanmaola, 1261 m, 12–14.V.2009, coll. Chen Fuqiang, 1♂ (Slide No. 1262); Bawangling, Donger Linchang, 1015 m, 8–10.V.2007, coll. Chen Fuqiang, 3♂; Lingshui, Diaoluoshan, 920 m, 2.V.2007, coll. Han Hongxiang, Lang Songyun, 2♂ (Slide No. 1236); Jianfeng, 14.IV.1980, coll. Zhang Baolin, 1♂; Jianfeng, 18.V.1982, coll. Chen Zhiqing, 1♂; Ledong, Jianfengling, 828 m, 24.III.2008, coll. Lang Songyun, 1♂ (Slide No. 1265). **Yunnan** (BMNH): Tsekou, R.P. Dubernard, Ex. Oberthür Coll. Brit. Mus. 1927-3, 1♂; Tsekou, P. Dubernard, Ex. Oberthür Coll. Brit. Mus. 1927-3, 1♂. **BHUTAN** (BMNH): Bhutan, Rothschild Bequest, B.M.1939-1, 1♂. **INDIA** (BMNH): Khasia Hills, Assam, Nissary, Joicey Bequest, Brit. Mus. 1934-120, Det. by L.B. Prout, 1♂; Sikkim, Darjeeling, R.P. Bretaudeau, 1894, Ex. Oberthür Coll. Brit. Mus. 1927-3, 1♂; Mussoree, India, L.B. Prout Coll. B.M. 1939-643, 1♂; Nilgiris, Hampson Coll. 89-129, 619.73, 1♂. **INDONESIA** (BMNH): Batoeriti, E. Bali, 3500 ft, VI.1935, (J.P.A. Kalis), Rothschild Bequest, B.M.1939-1, 1♂; Nongkodjadjar, E. Java, 4000 ft, IV.1934, (A.M.R. Wegner), Rothschild Bequest, B.M.1939-1, 1♂. **MALAYSIA** (BMNH): Mt. Kinabalu, Marei Parei, 5000 ft, 2.V.1929, 1♂ (Slide No. 8479; other labels "B. 1073; *Thalassodes veraria* Guen."); Nord Borneo, Mt. Kinabalu, 5.VIII.1903, John Waterstradt, Ex. Oberthür Coll. Brit. Mus. 1927-3, 1♂.

Diagnosis. In fresh specimens, the shaft of the antenna is brown, and the rami are green. The male genitalia can be distinguished by the following combination of features: the large well sclerotized, triangular sacculus; the short and strongly sclerotized basal and subsaccular ridge; the small ampulla appearing as ridge; the absence of basal paired processes on the juxta. The aedeagus posteriorly bears two large lobes, one of them is the developed and acute cornutus, and the other is very broad and blunt, but forming a tiny point at apex. The eighth segment is a little similar to that of *O. pervulgatus* in that both tergite and sternite are concave and the latter has the long anterior lateral processes. The lateral processes on the tergite are tapered and pointed in *O. falsaria* but blunt and with a rounded tip in *O. pervulgatus*. The processes of the sternite are much shorter in *O. falsaria* compared to those of *O. pervulgatus*. The female genitalia (from Inoue 2005) have a band-like lamella antevaginalis, an extremely short ductus bursae, and a large wrinkled corpus bursae with more than ten strip-like sclerites mesally.

Distribution. China (Taiwan, Hainan, Yunnan), India, Bhutan, Sri Lanka, Malaysia, Indonesia.

Pelagodes Holloway, 1996

Pelagodes Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 261. Type species: *Thalassodes aucta* Prout, 1912, by original designation. N.E. Himalaya.

Description. Head: Similar to that of *Thalassodes*. Thorax: Hind tibia with two pairs of spurs in both sexes. Male hind tibia not dilated, without hair-pencil and terminal extension. Wing pattern: Outer margin of both fore- and hind wings smooth; hind wing with outer margin slightly projecting at middle, straight or shallowly curved before middle, straight from middle to anal angle; inner margin elongated. Apex of forewing pointed or blunt, that of hind wing slightly protruding, rounded. Wings bluish green, semitransparent, diffused with white striations. Forewing with yellowish-brown costa; antemedial line directed obliquely distally, straight, sometimes indistinct; postmedial line straight. Hind wing with postmedial line straight or slightly wavy at upper half, bending proximally under CuA_1, then wavy to inner margin. Fringes whitish to pale yellowish. Venter paler than dorsum, streaks on dorsum discernible. Venation identical to that of *Thalassodes*. Abdomen: Third sternite of male abdomen without setal patches. Eighth sternite usually with a pair of large pointed lateral processes, adorned with various small spines,

occasionally smooth; tergite projecting, occasionally concave on posterior margin. Male genitalia: Uncus rod-like, slightly tapering posteriorly. Socii usually very broad and evenly wide, occasionally slightly tapering or three-dimensional. Gnathos with sclerotized simple median process. Valva long and narrow; costa extending to form a sclerotized free arm at middle or near apex of valva; sacculus simple or slightly protruding anteriorly. Transtilla a pair of lightly sclerotized processes. Juxta sometimes with two sclerotized lateral processes on posterior margin. Saccus semicircular, occasionally with two tiny protrusions on the terminal margin. Coremata absent. Aedeagus short and thick, sclerotized posteriorly and sometimes spinulose; cornutus usually indistinctly shaped; coecum penis short and broad. Female genitalia: Region around ostium wrinkled, sclerotized, usually with developed sterigma. Lamella postvaginalis often containing a pair of deeply dentate lateral sclerites. Lamella antevaginalis often with small lateral processes. Ductus bursae short. Corpus bursae spherical, or elongate; signum bicornute or absent.

Diagnosis. On the wing pattern, *Pelagodes* is extremely close to *Thalassodes*, but it can be distinguished by lacking the red scales on the outer margin; unlike *Thalassodes*, the fringes are usually white or pale yellow, rather than the outer margin diffused with red, at least on the hind wing (Holloway 1996). In the male genitalia, the very broad socii and the costal extension in *Pelagodes* distinguish it from the other three genera in this study. The eighth sternite is characterised by two large sclerotized lateral processes. The genus also lacks coremata and setal patches on the third sternite similar to *Orothalassodes* and *Remiformvalva*.

Distribution. China, Japan, India to South East Asia, New Guinea, Australia.

***Pelagodes antiquadraria* (Inoue, 1976)**
Figs 10, 29, 48, 65–70, 90

Thalassodes antiquadraria Inoue, 1976, *Tinea*, 10 (2): 9, figs 4–6. Holotype ♂, Japan: Okinawa Island, Yona. (BMNH)
Pelagodes antiquadraria: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 261.

Material examined. Holotype (BMNH), ♂, **JAPAN:** Yona Okinawa I., Ryukyus, Japan, 29.IV.1972, S. Azuma, Inoue Coll. B.M. 1992-71 (type status verified by K. Buckmaster in 1992, type photographed in colour); paratype (BMNH), Yona, Okinawa, 24.IV.1965, S. Azuma, 1♂ (Slide No. 9781; other two labels: "Paratype, *Thalassodes antiquadraria* Inoue, Det. H. Inoue, 1976", "No. 1265"). **CHINA: Zhejiang** (IZCAS): Lin'an, Xitianmushan, 400–1500 m, 26–29.VII.2003, coll. Han Hongxiang, 2♂ (Slide No. 636); Taishun, Wuyanling, Shuangkengkou, 680 m, 28–29.VII.2005, coll. Lang Songyun, 50♂4 ♀ (Slide No. 1200, 1201). **Jiangxi** (IZCAS): Jinggangshan, 3.VII.1975, coll. Zhang Baolin, 3♂ (Slide No. 617, 618); Doushui, 3.VII.1975, coll. Song Shimei, 6♂ (Slide No. 634). **Hunan** (IZCAS): Yizhang, Mangshan, Senlin Gongyuan, 512–770 m, 13–15.VII.2008, coll. Chen Fuqiang, 4♂; Yanling, Taoyuandong, 631 m, 4–8.VII.2008, coll. Chen Fuqiang, 6♂(Slide No. 1225). **Fujian** (IZCAS): Jiangle, Longqishan, 650 m, 18.VIII.1991, coll. Song Shimei, 1♂ (Slide No. 1195); Wuyishan, Dazhulan, 1150 m, 28.VII.2006, coll. Yang Chao, 1♂1♀. **Guangdong** (IZCAS): Ruyuan, Nanling, Baohuzhan, 1020 m, 16–20.VII.2008, coll. Chen Fuqiang, 40♂3♀ (Slide No. 1226); Shixing, Chebaling, 365–401 m, 22–26.VII.2008, coll. Chen Fuqiang, 14♂2♀. **Hainan** (IZCAS): Baisha, Hongkan Shuiku, 553 m, 3–5.V.2009, coll. Yan Keji, 1♂; Wuzhishan, Shuiman, 727–900 m, 8–10.V.2007, 6–9.XII.2007, 1.IV.2008, coll. Han Hongxiang, Lang Songyun, Li Jing, 11♀ (Slide No. 1190, 1241); Lingshui, Diaoluoshan, 95–929 m, 10–12.XII.2007, 31.III.2008, coll. Li Jing, Lang Songyun, 9♂13♀ (Slide No. 1206, 1211); Ledong, Jianfengling, 828–934 m, 14–17.XII.2007, 24.III.2008, coll. Li Jing, Lang Songyun, 6♂6♀ (Slide No. 1188(♂), 1189(♀)); Jianfengling, Tianchi, 828 m, 1–5.V.2007, coll. Chen Fuqiang, 1♂ (Slide No. 1187); Ledong, Jianfengling, Yulingu, 707 m, 21.V.2009, coll. Chen Fuqiang, Yan Keji, 1♂1♀ (Slide No. 1235(♂)). **Guangxi** (IZCAS): Fangcheng, Banba, 550 m, 4.VI.2000, coll. Li Wenzhu, Yao Jian, 1♂1♀ (Slide No. 1273(♀)); Longsheng, Neizujiang, 840 m, 7.VI.1963, coll. Wang Chunguang, 2♂ (Slide No. 1217); Napo, Defu, 1350 m, 18.VI.2000, coll. Yao Jian, 1♂ (Slide No. 1209); Shangsi, Hongqi Linchang, 300 m, 28.V.1999, coll. Zhang Yanzhou, Liu Dajun 2♂ (Slide No. 1210); Jinxiu Luoxiang, 450 m, 30.VI.2000, coll. Li Wenzhu, 1♂ (Slide No. 1208). **Yunnan** (IZCAS): Tengchong, Dahaoping, 2020 m, 5–7.VIII.2007, coll. Wu Chunguang, 2♂; Baoshan, Bawan, 1040 m, 8–10.VIII.2007, coll. Xue Dayong, Lang Songyun, 2♂1♀; Baoshan, Baihualing, 1520 m, 11–13.VIII.2007, coll. Lang Songyun, Wu Chunguang, 24♂3♀ (Slide No. 1227(♂)); Yingjiang, 15.IV.1980, coll. Li Hongxing, 3♂ (Slide No. 1180); Cangyuan, 750–790 m, 17–22.V.1980, coll. Song Shimei *et al*., 27♂1♀ (Slide No. 1182(♂)); Ruili, Dengga, 980 m, 6–8.V.1992, coll. Xue Dayong, 9♂3♀ (Slide No.

1181(♂)); Xishuangbanna, Xiaomengyang, 1000 m, 24.VIII, 3.IX.1957, coll. Wang Shuyong, 7♂ (Slide No. 1183); Xiaomengyang, 4–7.V.1980, coll. Wang Linyao, 7♂; Pingbian Daweishan, 1500 m, 14–19.V.1956, coll. Huang Keren *et al*., 1♂3♀ (Slide No. 1245(♂)). **Tibet** (IZCAS): Mêdog, 1060–1091 m, 13–23.VIII.2006, coll. Lang Songyun, 6♂3♀ (Slide No. 1223(♂), 1198(♂)). **BHUTAN** (BMNH): Bhutan, Rothschild Bequest, B.M. 1939-1, 1♂. **INDIA** (BMNH): Darjeeling, Mowis, 1891, Ex. Oberthür Coll. Brit. Mus. 1927-3, 1♂; Assam, W.F. Badgley, 1906-185, 1♂ (Slide No. 4069); *ibidem*, 1♀ (Slide No. 4070).

Diagnosis. *P. antiquadraria* is almost identical to *P. subquadraria* (Inoue, 1976) externally, but their male genitalia are quite different. For example, the distal half of the valva is comparatively narrower in *P. antiquadraria*, and the costal extension is situated mesally on the valva in the former species, but arises distally in the latter. In addition, *P. antiquadraria* has the typical very broad socii, but which are narrow and tapering in *P. subquadraria* and *P. sinuspinae* **sp. nov.** The costal extension is not tapering or acute, and is sometimes slightly ramose. Comparisons with *P. proquadraria* (Inoue, 1976) are summarized under that species. The male eighth sternite is distinguished by two large lateral processes, which are only basally curved, the other parts being almost straight, tapering and bearing two to seven small spines. The medial margin between the two lateral processes is strongly sclerotized and concave. In the female genitalia, the triangular medial part of the lamella antevaginalis is also characteristic.

Distribution. China (Zhejiang, Jiangxi, Hunan, Fujian, Taiwan, Guangdong, Hainan, Guangxi, Yunnan, Tibet), Japan, India, Bhutan, Thailand.

Remarks. *P. antiquadraria* is sympatric with *T. immissaria*. Both species are widely distributed in South China, and occupy most of the collection in IZCAS.

Pelagodes proquadraria (Inoue, 1976)

Figs 11, 30, 49, 71, 91

Thalassodes proquadraria Inoue, 1976, *Tinea*, 10 (2): 9, figs 7–9. Holotype ♂, Japan: Okinawa, Yona. (BMNH)
Pelagodes proquadraria: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 261.

Material examined. Holotype (BMNH), ♂, **JAPAN:** Yona Okinawa I., Ryukyus, Japan, 29.VI.1971, S. Azuma, Inoue Coll. B.M. 1992-71 (type status verified by K. Buckmaster in 1992, type photographed in colour); paratype (BMNH)**,** Shuri, Okinawa, 4.XI.1965, S. Azuma, No. 1266, Brit. Mus. 1976-608, 1♂. **CHINA: Taiwan** (BMNH): Kanschirei, Formosa, VII.1909, A.E. Wileman, Rothschild Bequest, B.M. 1939-1, 1♀ (Slide No. 4096); Koannania, Formosa, IX.1906, A. E. Wileman, Rothschild Bequest, B.M. 1939-1, 1♀.

Diagnosis. *P. proquadraria* is very similar to *P. antiquadraria*, except for the green frons, which is brown in *P. antiquadraria*. Moths of *P. proquadraria* are smaller than that of *P. antiquadraria*, with a forewing length 14–17 mm compared to 15–19 mm in both sexes. These two species can be distinguished on genitalia. The costal extension in *P. proquadraria* is straight and tapering and is not as curved as in *P. antiquadraria*. It is located much more distally than that of *P. antiquadraria*. The lateral processes in the male eighth sternite are much shorter than in *P. antiquadraria*, and are forked or divided into three thorns at the tip. However in *P. antiquadraria*, there are several teeth on the inner surface. The lamella antevaginalis in the female genitalia is smaller with two sclerites in *P. proquadraria*, but band-like and with two lateral processes in *P. antiquadraria*.

Distribution. China (Taiwan), Japan, India.

Pelagodes semengok Holloway, 1996

Figs 12, 13, 31, 32, 50, 72

Pelagodes semengok Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 263, pl. 10, [fig. 20]; fig. 301. Holotype ♂, Borneo: Sarawak, Kuching, Semengok. (BMNH)

Material examined. Holotype (BMNH), ♂, **MALAYSIA:** Sarawak: Kuching, Semengok, 3–9.II.1976 (Slide No. 8683). **CHINA: Hainan** (IZCAS): Bawangling, Donger Linchang, 1015 m, 8–10.V.2007, coll. Chen Fuqiang, 1♂; Bawangling, Donger Linchang, 1015 m, 19–21.XII.2007, coll. Li Jing, 1♂ (Slide No. 1216); Wuzhishan, Shuiman, 730–900 m, 8.V.2007, coll. Lang Songyun, Han Hongxiang, 4♂; Lingshui, Diaoluoshan, 95 m, 10.XII.2007, coll.

Li Jing, 1♂; Jianfengling, Tianchi, 828 m, 1–5.V.2007, coll. Chen Fuqiang, 1♂; Ledong, Jianfengling, 934 m, 14–17.XII.2007, coll. Li Jing, 1♂ (Slide No. 1244). **Guangxi** (IZCAS): Shangsi, Hongqi Linchang, 300 m, 29.V.1999, coll. Zhang Xuezhong, 1♂. **Yunnan** (IZCAS): Xishuangbanna, Bubeng, 700 m, 14–15.IX.1993, coll. Yang Longlong, 5♂1♀ (Slide No. 1186(♂)). **Tibet** (IZCAS): Mêdog, 812–1091 m, 14–23.VIII.2006, coll. Lang Songyun, 5♂ (Slide No. 1222, 1224).

Diagnosis. This and the next species are very similar in the male genitalia for both having recurved costal extensions, tapering at both ends but broad mesally. Also the distal half of the valva are narrower than in other congeners. The males of both species have a semicircular eighth abdominal tergite, and are distinctive in the eighth sternite by the large curved lateral processes, which are bifid apically, and with another tooth mesally. Inoue (2006) stated that sometimes there are two spines mesally, of which one may be forked. For additional comparisons see the following species descriptions.

Distribution. China (Taiwan, Hainan, Guangxi, Yunnan, Tibet), Philippines, Malaysia, Indonesia.

Remarks. One male specimen (Slide No. 1244) from Jianfengling, Hainan is different from others by having two small protrusions on the terminal margin of the saccus, which is only present in this single specimen. When more specimens having the same saccus were found, a distinct species would be erected.

***Pelagodes paraveraria* Han & Xue, sp. nov.**
Figs 14, 33, 51, 73

Description. Head: Antenna in male bipectinate for more than basal two-thirds, filiform terminally. Unknown in female. Frons green, rough-scaled. Labial palpus green, the third segment tinged with reddish brown, ventral surface white. Vertex with anterior half white, posterior half deep bluish green. Thorax: Dorsal side of thorax deep bluish green. Hind tibia with two pairs of spurs. Forewing length: ♂19 mm. Wings deep bluish green, diffused with white striations. Apex of forewing bluntly quadrate, that of hind wing protruding. Outer margin of forewing slightly curved, that of hind wing forming a distinct protrusion on M_3 end. Forewing with antemedial line slightly curved from costa to inner margin, slightly bending inwards on anal fold; postmedial line almost straight, slightly sinuous, especially near vein M. Hind wing with postmedial line bending outwards below M_3 and wavy to inner margin. Fringes of both wings yellow. Abdomen: Dorsal side of abdomen deep bluish green, yellow after discoloration. The male eighth segment modified, with tergite roundly protruding, and sternite bearing two large, strongly curved lateral processes, with a small diverging subapical branch; middle of posterior margin strongly sclerotized and protruding. Male genitalia: Uncus slender, tapering. Socii very broad, rounded. Gnathos with small basal protrusion and slender median process. Valva with basal half broad and distal half narrow, blunt terminally; costal extension subapical, slender, smooth, recurved, projecting beyond apex of valva. Juxta almost quadrate, a pair of blade-like processes medially on posterior margin, with ventral margin serrate. Aedeagus very short and broad; cornutus a slender process. Female genitalia: Unknown.

Material examined. Holotype ♂, **CHINA: Yunnan** (IZCAS): Xishuangbanna, Bubeng, 700 m, 14.IX.1993, coll. Xu Huanli (Slide No. 619). Paratype: **Yunnan** (IZCAS): Xishuangbanna, Bubeng, 700 m, 14.IX.1993, coll. Yang Longlong, 1♂.

Diagnosis. In the male genitalia, the pair of the blade-like processes on the juxta are acute and similar to that of *P. veraria* (Guenée, 1858) (Java), but are blunt in *P. waterstradti* Holloway, 1996 (Borneo). The costal extensions of these three species are different. It is much longer and extends beyond the end of the valva in *P. paraveraria* and *P. waterstradti*, but is much shorter in *P. veraria*, broader in *P. paraveraria* and slender in *P. waterstradti*. The cornutus of *P. paraveraria* is identical to that of *P. veraria*, but it is much broader and shorter in *P. waterstradti*. The male eighth sternite is also different in these species: the lateral processes are bifurcate in *P. paraveraria* and *P. veraria*, but have three branches in *P. waterstradti*. However the longer branch is shorter in *P. paraveraria*, compared to the much longer branch in *P. veraria*.

Distribution. China (Yunnan).

Etymology. The specific name is from the Latin prefix *para-* and the species name *veraria*, which means similar to *veraria*.

***Pelagodes bellula* Han & Xue, sp. nov.**
Figs 15, 34, 52, 74, 92

Description. Head: Antenna in male with basal half bipectinate, terminal half filiform, dorsally tinged with green; filiform in female. Frons dark green. Labial palpus pale green, ventral surface whitish, the third segment in female slightly elongate. Vertex with anterior half white, posterior half bluish green.

Thorax: Dorsal side of thorax deep bluish green, ventral side white. Hind tibia with two pairs of spurs in both sexes. Forewing length: ♂19–20.5 mm, ♀22 mm. Wings deep bluish green, diffused with white striations. Apex of forewing pointed, that of hind wing rounded; outer margin of forewing slightly curved, that of hind wing forming a blunt protrusion at end of M_3. Forewing with costa yellow; antemedial line slightly curved outwards; postmedial line straight, broadening from costa to inner margin. Hind wing with postmedial line slightly bending inwards from costa to vein M_3, then wavy and bending inwards to inner margin. Fringes of both wings yellow. Abdomen: Dorsal side of thorax deep bluish green, ventral side white. In male, the eighth tergite roundly protruding; the eighth sternite with two long, smooth, curved lateral processes, middle part of posterior margin concave, with two small blunt sublateral processes. Male genitalia: Uncus slightly tapering. Socii very broad, nearly quadrate. Gnathos with small basal protrusion and small rod-like median process. Valva with broad basal half and narrow distal half; costal extension small, smooth, incurved. Saccus roundly protruding. Aedeagus broad, with posterior half sclerotized; cornutus a blunt process. Female genitalia: Sterigma a quite complex area, with irregularly shaped sclerotized structure; lamella antevaginalis wrinkled longitudinally, margin irregularly dentate; lamella postvaginalis a pair of lateral sclerites connected to lamella antevaginalis, projecting posteriorly, margin serrate. Ductus bursae very short, indistinct. Corpus bursae very long, with posterior part folded and sclerotized partly; signum absent.

Material examined. Holotype, ♂, **CHINA: Tibet** (IZCAS): Mêdog, Yarang, 790 m, 19.VIII.2006, coll. Lang Songyun. Paratypes: **Tibet** (IZCAS): Mêdog, Yarang, 1091 m, 20–23.VIII.2006, coll. Lang Songyun, 2♂1♀ (Slide No. 1155(♂), 1196(♀)).

Diagnosis. This species is similar to *P. aucta* (Prout, 1912) (India) on external features, especially body size, and the male eighth sternite for both having smooth, curved lateral processes. But these two species can be distinguished on the following features of the male genitalia: the costal extension of *P. bellula* is basally broader, more tapering and pointed than in *P. aucta* (BMNH Slide No. 4092); the ventral margin of the valva is only slightly concave medially in *P. aucta*, but strongly expanded in the basal half in *P. bellula*; and, importantly, the sacculus has a sclerotized area in *P. aucta*, which is absent in *P. bellula*.

Distribution. China (Tibet).

Etymology. The specific name is from the Latin *bellus*, beautiful.

***Pelagodes simplvalvae* Han & Xue, sp. nov.**
Figs 16, 35, 53, 75, 93

Description. Head: Antenna in male bipectinate for about basal two-thirds, adpressed, filiform terminally, simple filiform in female. Frons dark reddish brown, rough-scaled. Labial palpus tiny, upper surface reddish brown, ventral surface whitish; the third segment in female distinctly elongate. Vertex with anterior half white, posterior half bluish green. Thorax: Dorsal side of thorax bluish green, ventral side white. Hind tibia with two pairs of spurs in both sexes. Forewing length: ♂13–14 mm, ♀15 mm. Wings deep bluish green, diffused with white striations. Apex of forewing blunt, that of hind wing protruding; outer margin of forewing slightly curved, that of hind wing slightly angled at middle. Costa a broad yellow band; antemedial line curved from costa to lower margin of cell, then straight and oblique to inner margin; postmedial line straight, almost perpendicular to inner margin. Hind wing with white postmedial line straight from costa to M_3, and forming a blunt protrusion below this vein, then slightly sinuous to inner margin. Fringes of both wings yellow, forming a yellow border together with yellow costa of forewing. Venter much paler, streaks on dorsum discernible. Abdomen: Dorsal side of abdomen bluish green, ventral side white. The eighth tergite strongly protruding. The eighth sternite small, but with large, slightly curved lateral processes, bearing three to four small teeth on inner surface and a longer tooth at tip; middle part of posterior margin concave, with another two blunt, triangular protrusions. Male genitalia: Uncus rod-like. Socii very broad. Gnathos lacking basal protrusions, median process small. Valva almost lacking costal extension, only with vestige of

small protrusion at middle of costa; ventral margin expanded at base, concave at middle. Juxta with two lateral processes projecting posteriorly. Saccus rounded. Aedeagus short and broad, posterior half sclerotized and scobinate. Female genitalia: Lamella postvaginalis a pair of lateral sclerites, margin serrate with several pointed teeth. Lamella antevaginalis pocket-like. Ductus bursae wrinkled and sinuous. Corpus bursae large, rounded, with a bicornute signum.

Material examined. Holotype, ♂, **CHINA: Hainan** (IZCAS): Jianfengling, 23.V.1980, coll. Gu Maobin (*Albizzia procera*). Paratypes: **Hainan** (IZCAS): Jianfengling, 29.VII.1982, coll. Gu Maobin, 1♂; Jianfengling, 24.VIII.1982, coll. Liang Chengfeng, 1♂ (Slide No. 614); Jianfengling, 14.X.1983, coll. Gu Maobin, 1♀ (Slide No. 1295).

Diagnosis. The male genitalia of *P. simplvalvae* are similar to that of *P. ogasawarensis* (Inoue, 1994) (Japan, BMNH Slide No. 17788) on the simple, unadorned valva. But in the latter species, the costa bears a small distinct tooth beyond middle, compared to the indistinct trace of a tiny protrusion more proximally located in *P. simplvalvae*. In addition, the ventral margin of the valva of *P. ogasawarensis* is only shallowly concave at middle with the basal half slightly curved, but strongly expanded in the basal half in *P. simplvalvae*. The male eighth segment is also different as follows: the lateral processes of the eighth sternite are smooth in *P. ogasawarensis* but bear several small teeth in *P. simplvalvae*; the margin between lateral processes bears two triangular protrusions in *P. simplvalvae* but is only slightly curved in *P. ogasawarensis*; the tergite is much narrower in *P. simplvalvae* than in *P. ogasawarensis*. The female genitalia are quite different in that the corpus bursae is very large, broad with a signum in *P. simplvalvae*, but is slender and lacks a signum in *P. ogasawarensis*.

Biology. From the label data of the holotype, the food plant of this species is recorded as *Albizzia procera* (Leguminosae).

Distribution. China (Hainan).

Etymology. The specific name is from the Latin prefix *simpl-* (=simple) and the Latin word *valva*, referring to the simple valva of the species.

Pelagodes subquadraria (Inoue, 1976)

Figs 17, 36, 54, 76–79, 94

Thalassodes subquadraria Inoue, 1976, *Tinea*, 10 (2): 7, figs 1–3. Holotype ♂, Japan: Kobe. (BMNH)
Pelagodes subquadraria: Holloway, 1996, *Malay. Nat. J.*, 49 (3–4): 261.

Material examined. Holotype (BMNH), ♂, **JAPAN**: Japan, Kobe, 1.VII.1929, J.E.A. Lewis, B.M. 1930-548 (Slide No. 4067; type status verified by K. Buckmaster in 1995); paratypes: kobe, 3.VII.1927, Brit. Mus. 1928-68, 1♂; kobe, 25.IX.1929, J.E.A. Lewis, B.M. 1930-548, 1♀. **CHINA: Henan** (IZCAS): Xinyang, Jigongshan, 250 m, 20–21.VII.2002, coll. Han Hongxiang, 1♂ (Slide No. 611). **Zhejiang** (IZCAS): Hangzhou, 15–16.VIII.1972, coll. Liu Youqiao, 4♂. **Hunan** (IZCAS): Guluo, VII.1981, 1♂ (Slide No. 1266); Cili, VI.1981, 1♂. **Fujian** (IZCAS): Nanping, Xiqin, 27.V.1980, coll. Zhuang Bie, 1♂ (Slide No. 616); Laizhou, 26.IX.1981 (reared from pupa, *Cinnamomum camphora*, Slide No. 1267). **Guangdong** (IZCAS): Guangzhou, Zhiwuyuan, 17.IV.1978, 1♂ (Slide No. 1270). **Guangxi** (IZCAS): Guilin, Yanshan, 200 m, 12, 15.V.1963, coll. Wang Chunguang, 2♂ (Slide No. 1268); Guilin, 8.VI.1980, coll. Zhong Tiesen (Slide No. 1218, 1254, 1255), 9♂; Longsheng, 300 m, 10–11.VI.1980, coll. Wang Linyao, 5♂ (Slide No. 1219); Shangsi, Hongqi Linchang, 300–350 m, 28–29.V.1999, coll. Liu Dajun *et al.*, 6♂ (Slide No. 620, 1249, 1269); Shangsi, Nanping, 350 m, 10.VI.2000, coll. Li Wenzhu, 1♂. **JAPAN** (BMNH): Kasoshima, prov. Satsuma, Kyushu, VIII, 1899, A.E. Wileman, Wileman Coll. B.M. 1929-261, 1♀.

Diagnosis. In the male genitalia, *P. subquadraria*, *P. forceps* Holloway, 1996 (Peninsular Malaysia, Borneo, Sulawesi, Philippines), and *P. sinuspinae* **sp. nov.** have tapering socii, which are different from the very broad socii in the previous species. The costal extension is excurved in the holotype of *P. subquadraria* (almost straight in Inoue, 1982: pl. 316, fig. 2), recurved in *P. sinuspinae*, also excurved in *P. forceps* but is more acute and longer and extends further and beyond the apex of the valva. In the female genitalia, the lamella antevaginalis bears two lateral pointed processes, and the posterior margin between two processes is rounded. The lamella postvaginalis is appeared as a pair of serrated sclerites. The ductus bursae is very short. The corpus bursae is large, and expanding abruptly in the anterior two thirds. The bicornute signum is present.

Distribution. China (Henan, Zhejiang, Hunan, Fujian, Taiwan, Guangdong, Guangxi), Japan.

Biology. From one specimen, it is known that one of the food plants is *Cinnamomum camphora* (Lauraceae).

Remarks. Although the lateral processes on the male eighth sternite are bifid, the diverging point is different among *P. subquadraria*, *P. forceps* and *P. sinuspinae*. It is located at about distal one-third in the type of *P. subquadraria*, about distal one-fourth in *P. forceps*, and about distal one-fifth in *P. sinuspinae*. Many specimens in IZCAS have identical male genitalia to the holotype of *P. subquadraria*, but the branches of the lateral processes on the eighth sternite are shorter, with the diverging point located at about one-fifth to one-fourth. However, the two forks are of similar length though unevenly. In figure 79 (no label information for the specimen), the diverging point is more basally. The bifid lateral processes of the eighth sternite are variable.

Pelagodes sinuspinae Han & Xue, sp. nov.

Figs 18, 37, 55, 80

Description. Head: Antenna bipectinate in male, adpressed, unknown in female. Frons brown. Labial palpus brown, ventral surface whitish. Vertex greenish. Thorax: Dorsal side of thorax green, concolorous with wings, ventral side white. Hind tibia with two pairs of spurs in male. Forewing length: ♂17 mm. Wings green. Forewing: costa yellow; antemedial and postmedial lines almost straight from costa to inner margin. Hind wing with postmedial line straight from costa to M_3, then bending inwards and sinuous to inner margin. Fringes of both wings bluish green. Abdomen: Eighth tergite in male with distal half narrow and posterior margin almost flat. Eighth sternite bearing two large lateral processes, basal half straight, distal half slightly curved, unevenly bifid at tip with the diverging point at about distal one-fifth. Male genitalia: Uncus rod-like, slightly tapering. Socii relatively narrow and tapering. Gnathos lacking basal and lateral protrusion, with median process rod-like. Valva broad, blunt terminally; costal extension arising from less than distal one-fourth, slightly recurved. Ventral margin of valva with a small excavation medially. Juxta large, with two small lateral processes protruding posteriorly. Saccus rounded. Aedeagus spinulose posteriorly, both lateral lobe and cornutus blunt and slightly sclerotized. Female genitalia: Unknown.

Material examined. Holotype ♂, **CHINA: Yunnan** (IZCAS): Xishuangbanna, Xiaomengyang, 850 m, 3.VII.1957, coll. Wang Shuyong (Slide No. 1246).

Diagnosis. The differences from the previous species are listed under *P. subquadraria*. In the male genitalia, the recurved costal extension is similar to that of *P. rana* Holloway, 1996 (Borneo) and *P. tridens* Holloway, 1996 (Borneo), but it is located more distally than in the other two species. The lateral processes on the eighth sternite are slender and unevenly forked in *P. sinuspinae*, but short, broad and bearing three to four spines in *P. rana* and *P. tridens*.

Distribution. China (Yunnan).

Etymology. The specific name is from the Latin prefix *sinu-* and the Latin word *spina*, referring to the curved costal extension.

Pelagodes clarifimbria (Prout, 1919), new record for China

Figs 19, 38, 56, 81–82, 95

Thalassodes clarifimbria Prout, 1919, *Ann. Mag. nat. Hist.* (9) 4: 278. Holotype ♀, Ceylon [Sri Lanka]: Maskeliya. (BMNH)
Pelagodes clarifimbria: Holloway, 1996, *Malay. Nat. J.*, 49 (3–4): 264.

Material examined. CHINA: Hainan (IZCAS): Yinggeling, 950–1100 m, 27.VIII–12.IX.2005, coll. Liu Chunxiang, 1♂; Baisha, Yinggeling, Hongxincun, 429 m, 16–17.XI.2008, coll. Li Jing, 2♂ (Slide No. 1204); Bawangling, Donger Linchang, 1015 m, 8–10.V.2007, coll. Chen Fuqiang, 3♂; *ibidem*, 1015 m, 19–21.XII.2007, coll. Li Jing, 2♂ (Slide No. 1215); Wuzhishan, Shuiman, 730–900 m, 8–11.V.2007, coll. Han Hongxiang, Lang Songyun, 4♂ (Slide No. 1240, 1256). BMNH Geometridae Slide photographs examined, 2♂1♀ (Slide No. 10697 from Borneo, 10726 from Borneo, 4085(♀)).

Diagnosis. The male genitalia of *P. clarifimbria* are distinguished by the following characters. The socii are broad, tapering and three-dimensional, with median part concave. The gnathos is well developed, with the lateral arms strongly expanded, tongue-like, and the median process small, rod-like and blunt. The valva is short and

broad, with terminal half abruptly narrow, and wtih a deep notch mesally; the sacculus is broad; the costa is expanded, slightly concave medially; a spine-like to rounded but acute process is at the base of the valva (BMNH Slide No. 10697, 10726). The aedeagus is club-like, with two blunt cornuti, each bearing a tiny triangular pointed tooth. The most distinctive character are in the elaborate structures of the male eighth sternite; a pair of large spinose crab-claw like lateral processes; two small triangular, pointed lateral processes; and the simple mesal margin or with two distinctly protruding processes (Figs 81, 82). The male eighth tergite is deeply U-shaped and concave at the posterior margin, with two even width protrusions. The female genitalia are similar to those of *P. antiquadraria* in the developed lamella postvaginalis, which appears as a large pair of sclerites with the deeply dentate margin; the wrinkled ductus bursae; the rounded corpus bursae; and, the similar signum. But the number of the teeth on the margin of the lamella postvaginalis in *P. clarifimbria* exceeds that in *P. antiquadraria*.

Distribution. China (Hainan), Sri Lanka, Malaysia, Indonesia.

Remarks. All the specimens from Hainan and Borneo have a basal costal process, though they are different shapes from each other. This probably means that this feature is highly variable. It is most likely that the specimens from Hainan and Borneo represent different forms of *P. clarifimbria*. It is also possible that more than one species are included. But before to draw a conclusion, a long series of material from various areas of Asia are need to be examined. For the time being we have treated material from Hainan as *P. clarifimbria* (pers. comm. with A. Galsworthy).

Remiformvalva Inoue, 2006

Remiformvalva Inoue, 2006, *Tinea* 19 (3): 241. Type species: *Thalassodes viridicaput* Warren, 1897b, by original designation. Sulawesi.

Description. Head: Antenna in male with basal half to two-thirds bipectinate, adpressed, terminal half filiform; filiform in female. Frons slightly protruding, rough-scaled. Labial palpus developed, third segment of female not elongate. Thorax: Hind tibia with two pairs of spurs in both sexes. Male hind tibia not dilated, without hair-pencil and terminal extension. Wing pattern: Apex of forewing blunt, that of hind wing rounded; outer margin of both fore- and hind wings smooth, slightly projecting at middle on hind wing; inner margin elongate. Wings usually bluish green, semitransparent, but pure green in *R. subviridis* (Warren, 1905) (Christmas Island). Forewing with antemedial line directed obliquely outwards, straight; postmedial line perpendicular. Hind wing with postmedial line curved or angled below vein M_3, then sinuous to inner margin. Venter paler than dorsum, streaks on dorsum discernible. Venation identical to that of *Thalassodes*. Abdomen: Male with the third sternite lacking setal patches; eighth tergite rounded or shallowly bilobed; eighth sternite deeply concave at middle, with one or two pairs of central processes, the inner pair slender than the outer pair. Male genitalia: Uncus rod-like, slightly tapering, with acute tip. Socii narrow, of similar length to the uncus. Gnathos lacking basal protrusion, median process slender. Valva paddle-shaped; cucullus sclerotized and spinose; valval ventral margin deeply concave mesally. A pair of horn-like or digitiform processes on apex of juxta, strongly projecting posteriorly. Aedeagus slender, sclerotized posteriorly, without cornutus. Female genitalia: Lamella postvaginalis not distinct. Ostium with ventral part rounded, connected to broad ductus bursae. Corpus bursae oval, signum absent.

Diagnosis. Members of *Remiformvalva* are smaller compared to most species of *Thalassodes*, *Orothalassodes* and *Pelagodes*, usually with a wingspan of less than 28 mm (Inoue 2006). Other external features are almost identical to the other three genera. But *Remiformvalva* can be differentiated on the paddle-shaped valva and absence of costal extension. The male eighth sternite is also characteristic by the 2 or 4 spine-like processes in the middle of the deeply concave posterior margin.

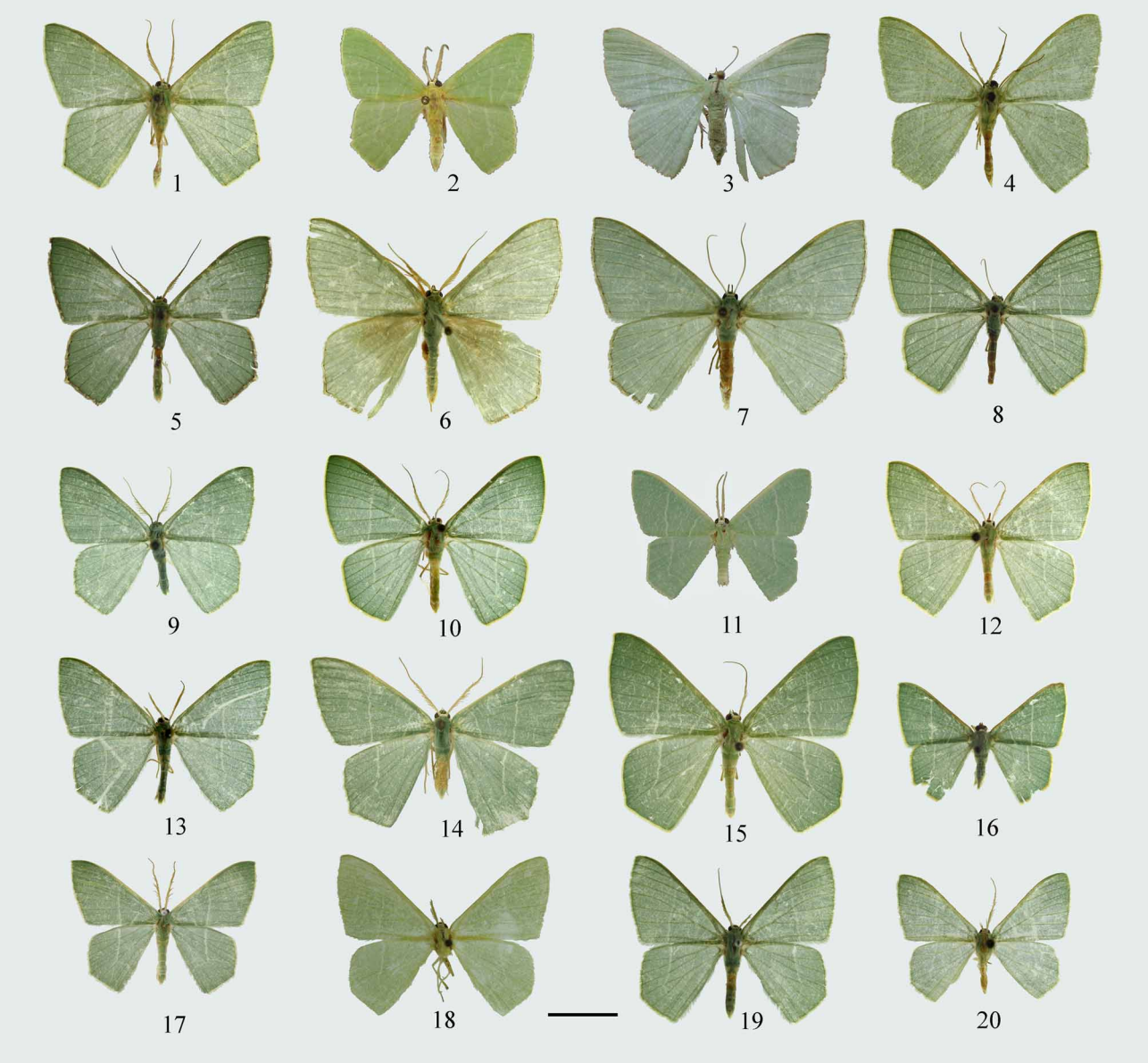
Distribution. China, Malaysia, Indonesia, Sri Lanka, Philippines, Palau Islands, New Guinea, Australia.

Remiformvalva viridicaput (Warren, 1897b), new record for China

Figs 20, 39, 57, 83, 96

Thalassodes viridicaput Warren, 1897b, *Novit. zool*. 4: 391. Holotype ♂, Celebes (south) [Sulawesi]. (BMNH)
Pelagodes viridicaput: Holloway, 1996, *Malay. Nat. J*., 49 (3–4): 264.
Remiformvalva viridicaput: Inoue, 2006, *Tinea* 19 (3): 241.

Material examined. CHINA: Hainan (IZCAS): Baisha, Yinggezui, 611 m, 6–7.V.2009, coll. Chen Fuqing, 1♀; Baisha, Nankai, Nanmaola, 1261 m, 10.V.2009, coll. Chen Fuqing, 1♀ (Slide No. 1234); Bawangling, Donger Linchang, 1015 m, 8–10.V.2007, coll. Chen Fuqiang, 1♀ (Slide No. 1207); Bawangling, 145 m, 18, 21.XII.2007, coll. Li Jing, 2♂1♀; Dongfang Nongchang, 11.VIII.1984, coll. Liu Yuanfu, 1♂; Wuzhishan, Shuiman, 730–900 m, 9.V.2007, coll. Han Hongxiang, 1♂; Lingshui, Diaoluoshan, 920 m, 2, 4.V.2007, coll. Han Hongxiang, Lang Songyun, 2♂1♀; *ibidem*, 929 m, 11–12.XII.2007, coll. Li Jing, 1♂; Jianfengling, 16.VI.1973, 1♀; Jianfeng, 28.IV.1978, coll. Zhang Baolin, 1♂ (Slide No. 1253); Jianfengling Tianchi, 25.IV.1980, coll. Zhang Baolin, 1♀; Jianfengling, 6.V.1981, coll. Wang Chunling, 1♂; Ledong, Jianfengling, 934 m, 14–17.XII.2007, coll. Li Jing, 1♂1♀ (Slide No. 1194(♂), 1238(♀)).

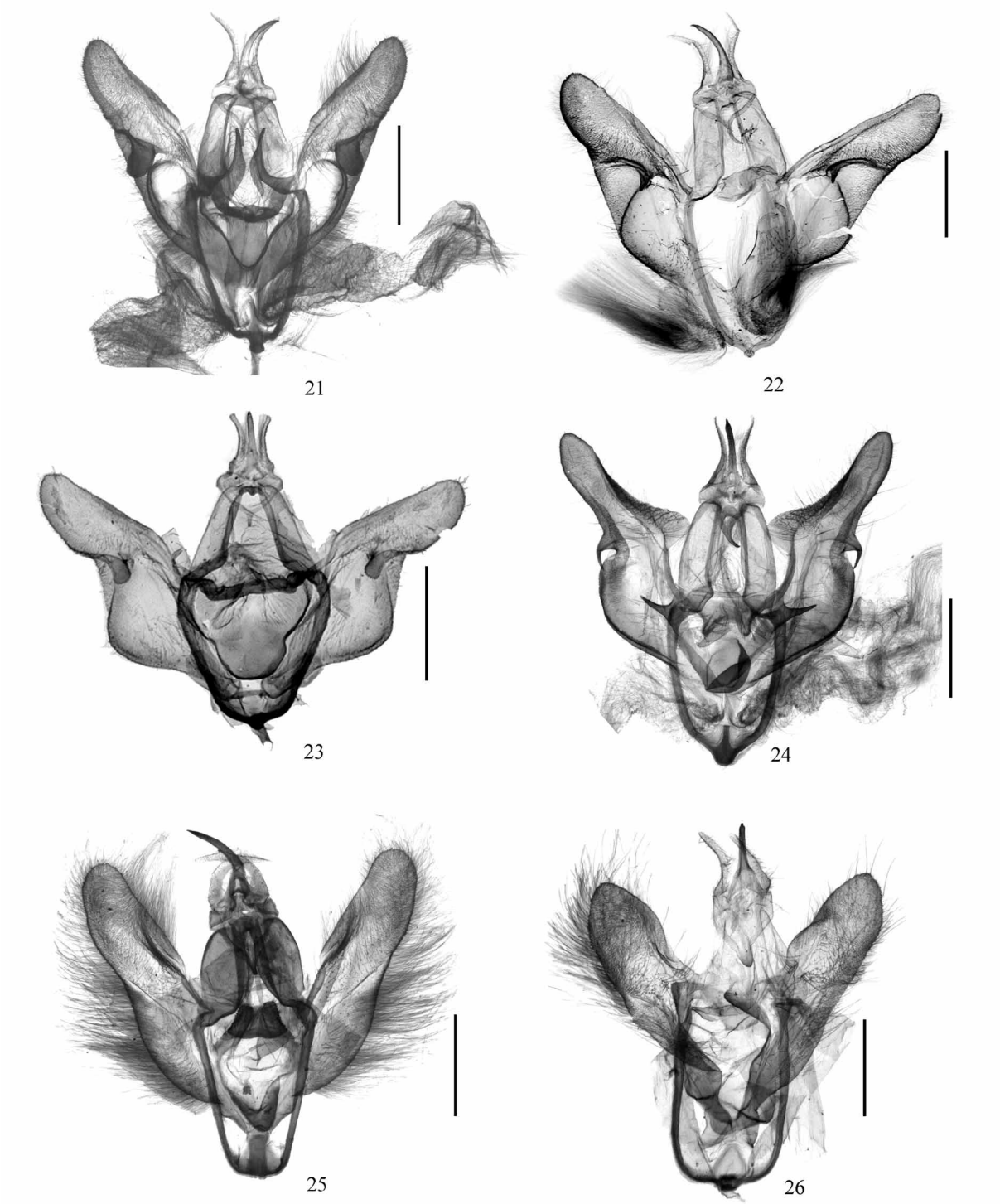


FIGURES 1–20. Adults of *Thalassodes*, *Orothalassodes*, *Pelagodes* and *Remiformvalva*. 1, *Thalassodes immissaria*; 2, *T. intaminata*; 3, *T. maipoensis*; 4, *T. opalina*; 5, *Orothalassodes hypocrites*; 6–7. *O. floccosa*. 6, male; 7, female; 8, *O. pervulgatus*; 9, *O. falsaria*; 10, *Pelagodes antiquadraria*; 11, *P. proquadraria*; 12–13, *P. semengok*; 14, *P. paraveraria* **sp. nov.**, holotype; 15, *P. bellula* **sp. nov.**, holotype; 16, *P. simplvalvae* **sp. nov.**, holotype; 17, *P. subquadraria*; 18, *P. sinuspinae* **sp. nov.**, holotype; 19, *P. clarifimbria*; 20, *Remiformvalva viridicaput*. Scale bar = 1 cm.

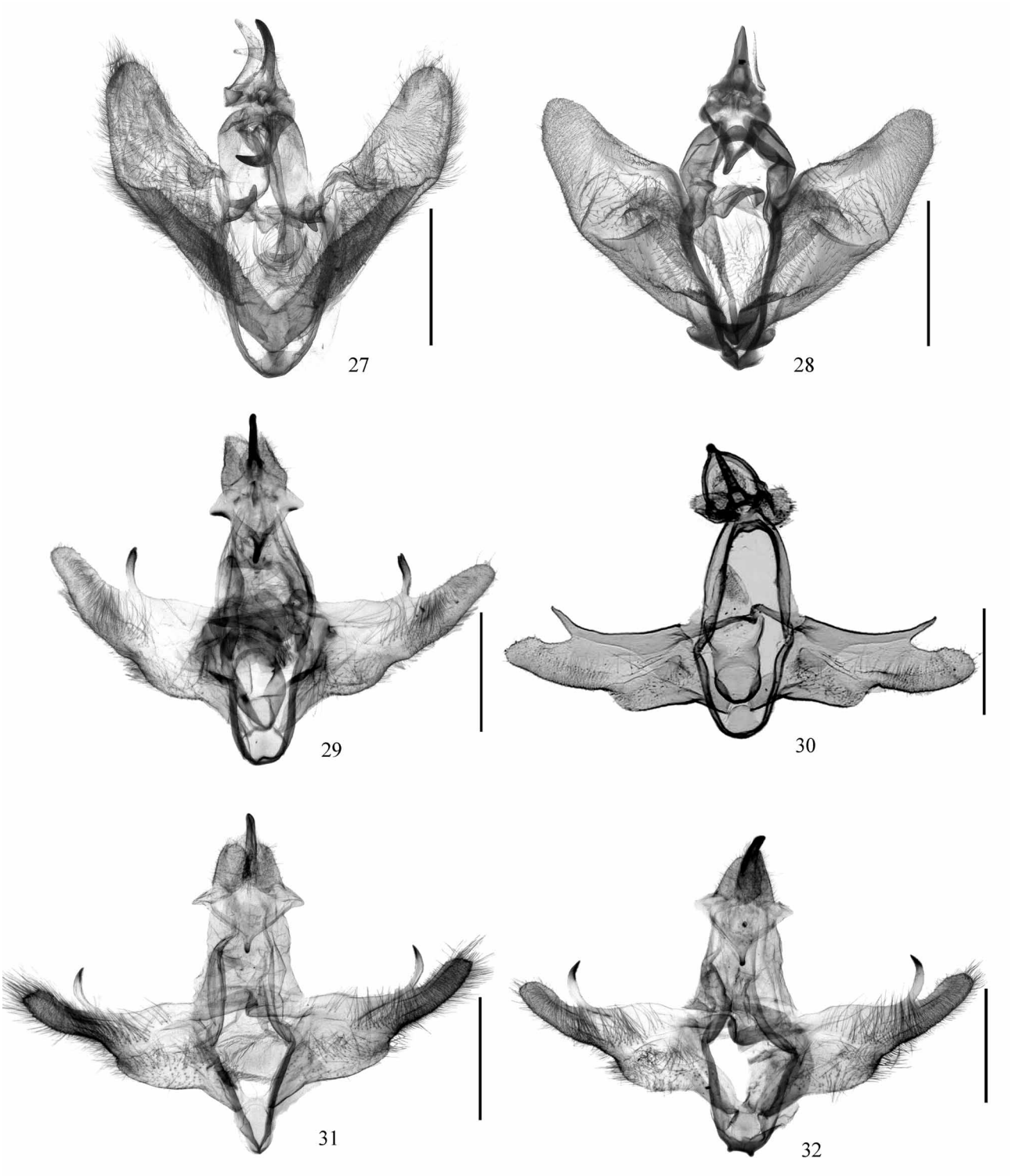
Diagnosis. The male genitalia of *R. viridicaput*, *R. subviridis* and *R. minimus* (Inoue, 2003) (Palau Islands), are quite different to those of *R. spiniseparati* (Holloway, 1996) (Peninsular Malaysia, Borneo) and *R. longicornuta* Inoue, 2006 (Philippines) on their relatively shorter juxtal processes. Additionally, the male eighth sternite bears

two pairs of scobinate pointed processes in *R. viridicaput* and *R. subviridis*, but only one pair of processes in *R. minimus*. The juxtal processes are curved and broader in *R. subviridis*, but slightly tapering and straight in *R. viridicaput*. The cucullus is totally scobinate, but only scobinate at mesally in *R. subviridis*. The female genitalia are firstly described here as below. Female genitalia: The lamella postvaginalis is a sub-quadrate spinose area, with a denser central ridge extending anteriorly. The width of the ductus bursae is less than half the width of the oval corpus bursae. The signum is absent.

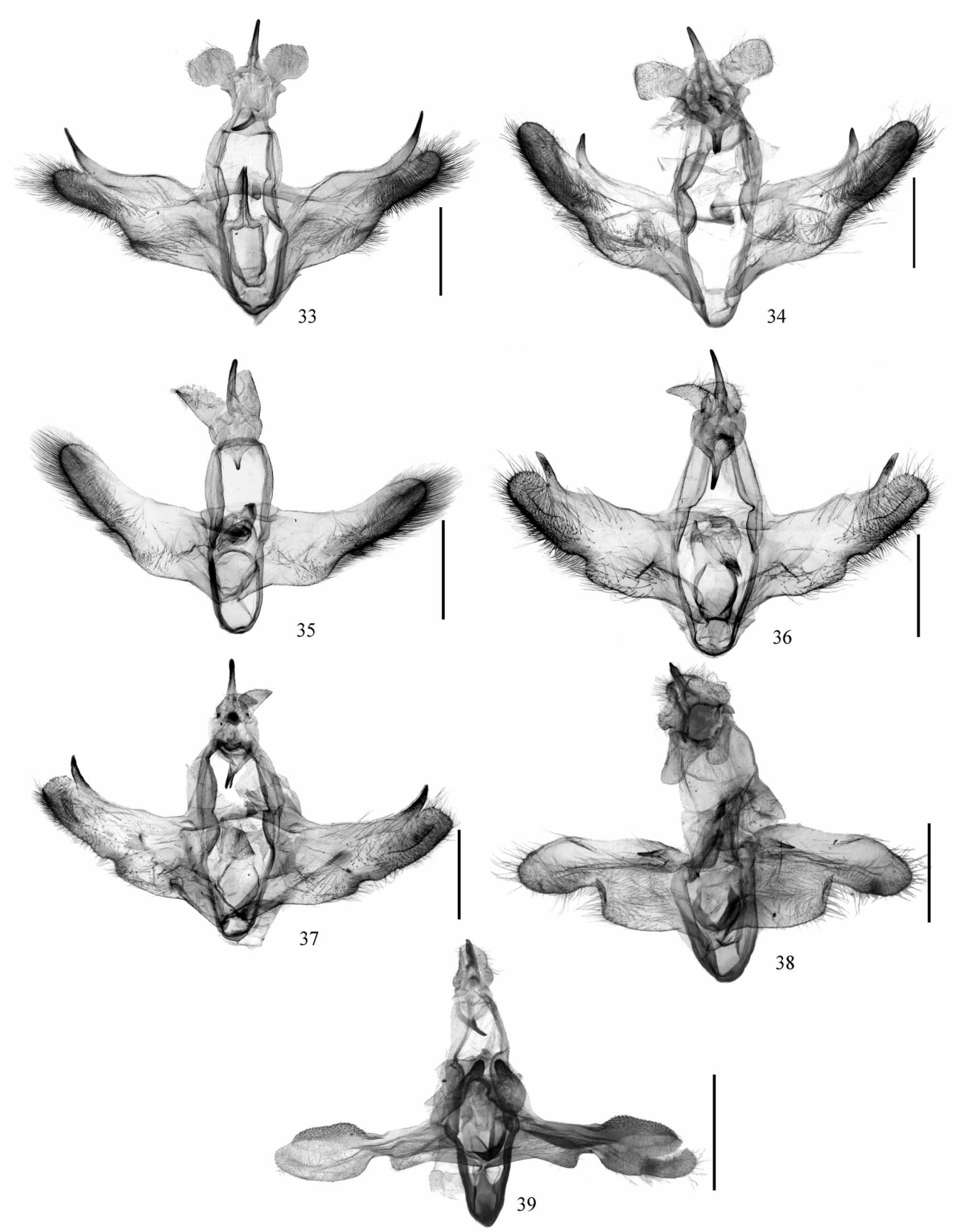
Distribution. China (Hainan), Malaysia, Indonesia.



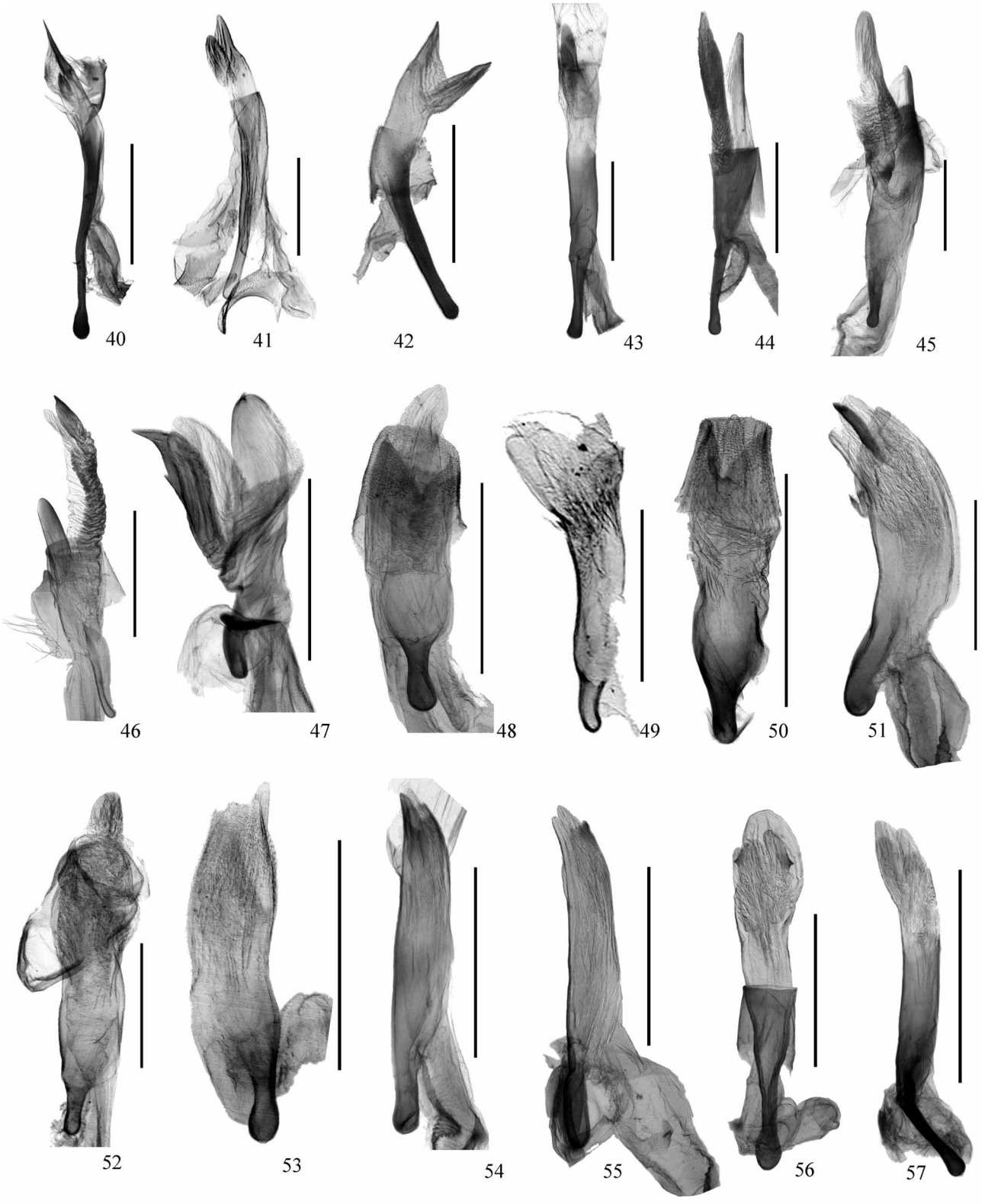
FIGURES 21–26. Male genitalia of *Thalassodes* and *Orothalassodes*. 21, *Thalassodes immissaria*; 22, *T. intaminata*; 23, *T. maipoensis*; 24, *T. opalina*; 25, *Orothalassodes hypocrites*; 26, *O. floccosa*. Scale bars = 1 mm.



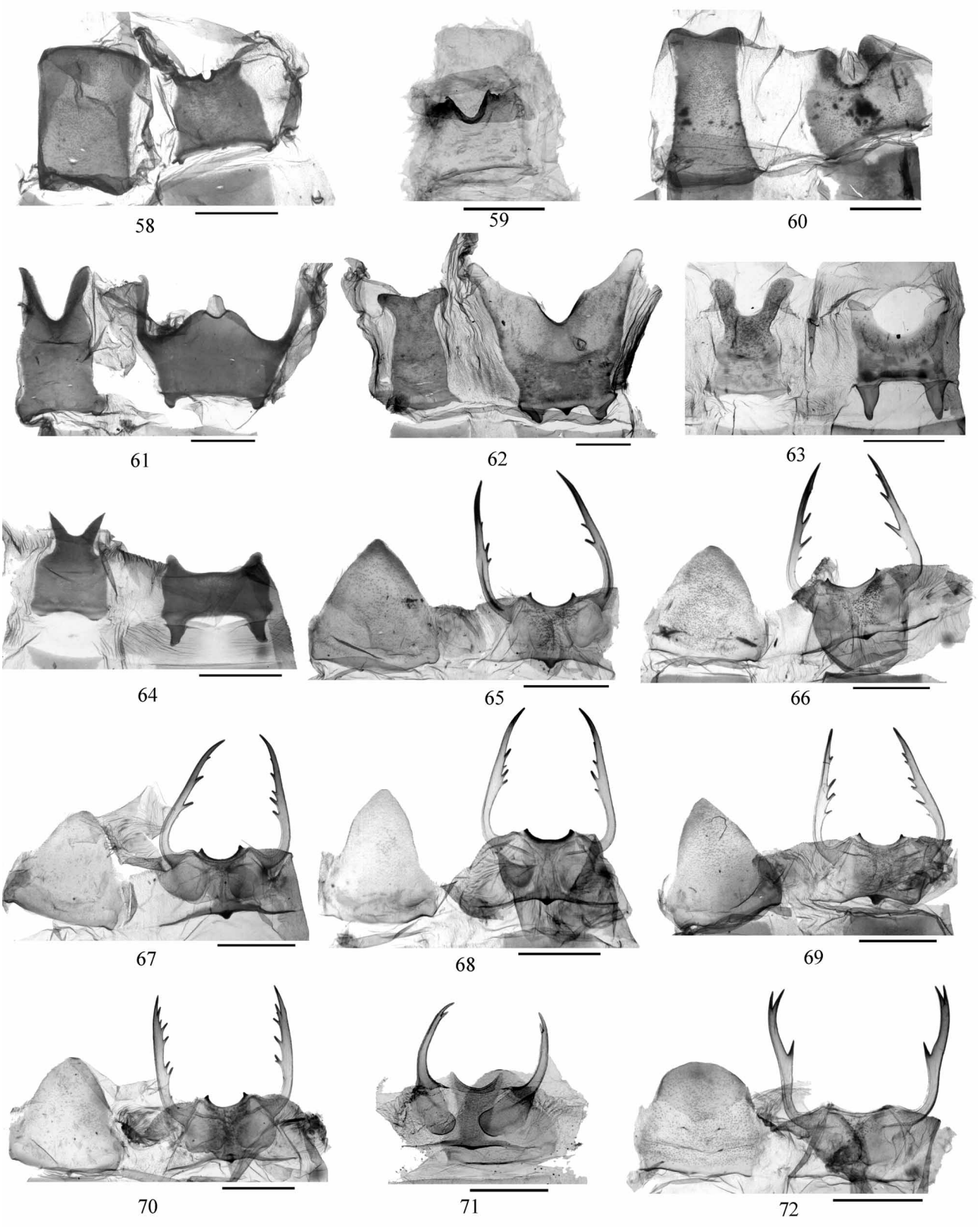
FIGURES 27–32. Male genitalia of *Orothalassodes* and *Pelagodes*. 27, *Orothalassodes pervulgatus*; 28, *O. falsaria*; 29, *Pelagodes antiquadraria*; 30, *P. proquadraria*; 31–32, *P. semengok*. Scale bars = 1 mm.



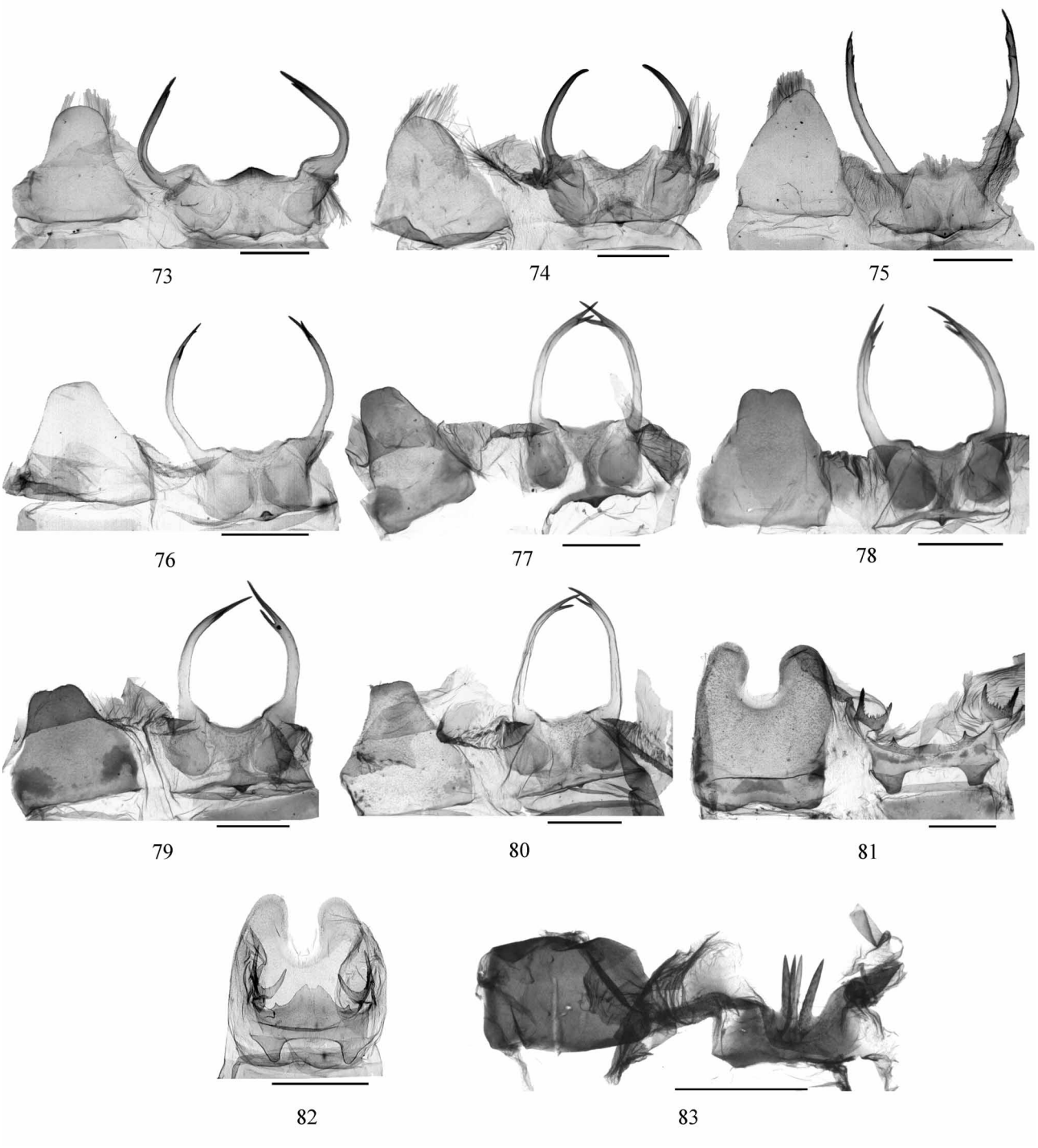
FIGURES 33–39. Male genitalia of *Pelagodes* and *Remiformvalva*. 33, *Pelagodes paraveraria* **sp. nov.**; 34, *P. bellula* **sp. nov.**; 35, *P. simplvalvae* **sp. nov.**; 36, *P. subquadraria*; 37, *P. sinuspinae* **sp. nov.**; 38, *P. clarifimbria*; 39, *Remiformvalva viridicaput*. Scale bars = 1 mm.



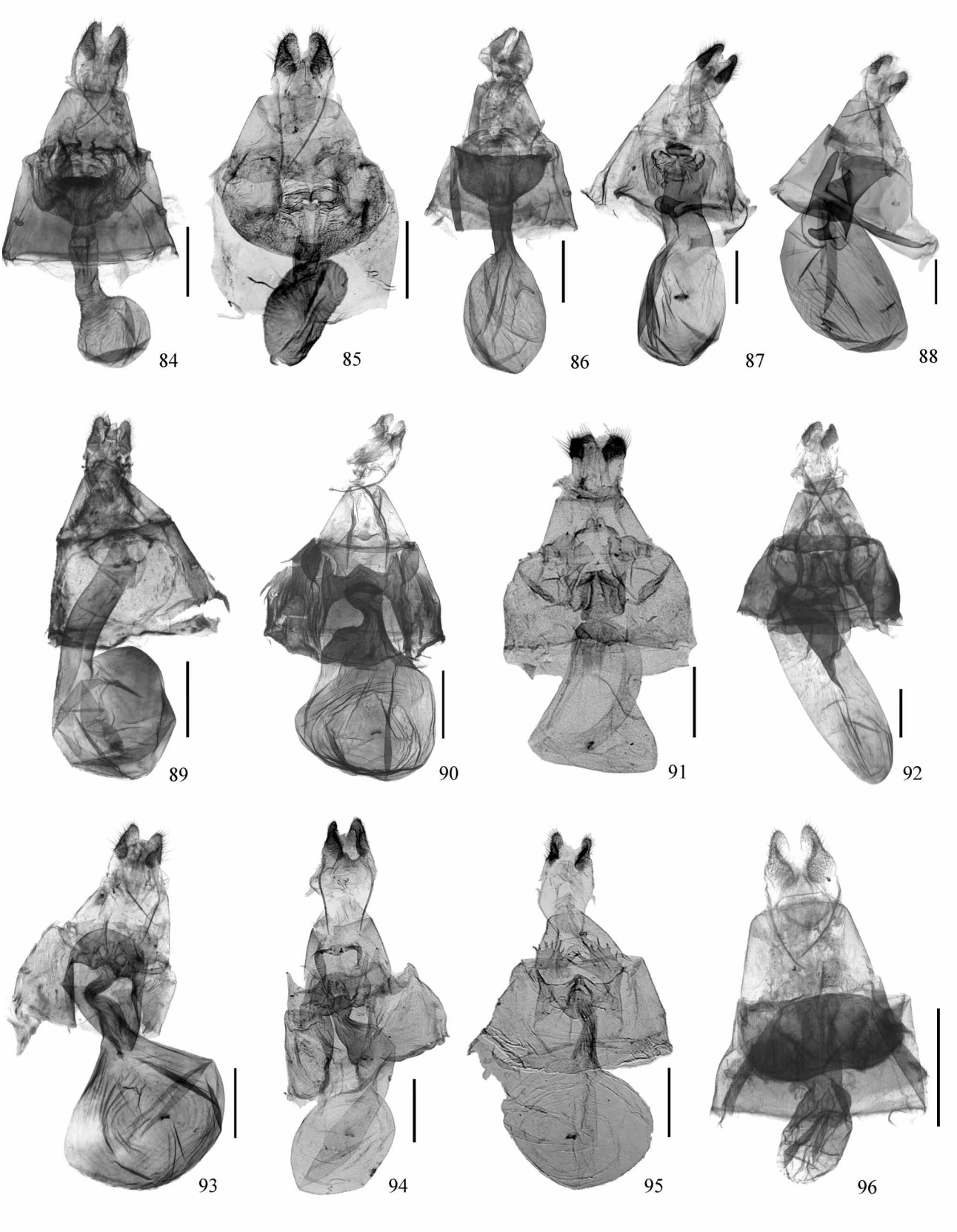
FIGURES 40–57. Aedeagus of *Thalassodes*, *Orothalassodes*, *Pelagodes* and *Remiformvalva*. 40, *Thalassodes immissaria*; 41, *T. intaminata*; 42, *T. maipoensis*; 43, *T. opalina*; 44, *Orothalassodes hypocrites*; 45, *O. floccosa*; 46, *O. pervulgatus*; 47, *O. falsaria*; 48, *Pelagodes antiquadraria*; 49, *P. proquadraria*; 50, *P. semengok*; 51, *P. paraveraria* **sp. nov.**; 52, *P. bellula* **sp. nov.**; 53, *P. simplvalvae* **sp. nov.**; 54, *P. subquadraria*; 55, *P. sinuspinae* **sp. nov.**; 56, *P. clarifimbria*; 57, *Remiformvalva viridicaput*. Scale bars = 1 mm.



FIGURES 58–72. The eighth segment of *Thalassodes*, *Orothalassodes* and *Pelagodes*. 58, *Thalassodes immissaria*; 59, *T. intaminata*; 60, *T. opalina*; 61, *Orothalassodes hypocrites*; 62, *O. floccosa*; 63, *O. pervulgatus*; 64, *O. falsaria*; 65–70, *Pelagodes antiquadraria*; 71, *P. proquadraria*; 72, *P. semengok*. Scale bars = 1 mm.



FIGURES 73–83. The eighth segment of *Pelagodes* and *Remiformvalva*. 73, *P. paraveraria* **sp. nov.**; 74, *P. bellula* **sp. nov.**; 75, *P. simplvalvae* **sp. nov.**; 76–79, *P. subquadraria*; 80, *P. sinuspinae* **sp. nov.**; 81–82, *P. clarifimbria*; 83, *Remiformvalva viridicaput*. Scale bars = 1 mm.



FIGURES 84–96. Female genitalia of *Thalassodes*, *Orothalassodes*, *Pelagodes* and *Remiformvalva*. 84, *Thalassodes immissaria*; 85, *T. intaminata*; 86, *T. opalina*; 87, *Orothalassodes hypocrites*; 88, *O. floccosa*; 89, *O. pervulgatus*; 90, *Pelagodes antiquadraria*; 91, *P. proquadraria*; 92, *P. bellula* **sp. nov.**; 93, *P. simplvalvae* **sp. nov.**; 94, *P. subquadraria*; 95, *P. clarifimbria*; 96, *Remiformvalva viridicaput*. Scales bars = 1 mm.

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