

A contribution to the knowledge of the Doryctinae of Taiwan (Hymenoptera: Braconidae)

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Sixteen genera and 41 species of the subfamily Doryctinae are recorded for the Taiwan fauna. Ten new species are described and figured: *Ipodoryctes korotyaei* sp. n., *Doryctes denticoxa* sp. n., *D. henryi* sp. n., *Ontsira gratia* sp. n., *Heterospilus hemites-taceus* sp. n., *Spathiomorpha enderleini* sp. n., *Spathius paracritolaus* sp. n., *S. wusheensis* sp. n., *S. convexitemporalis* sp. n., *S. taiwanicus* sp. n. Redescriptions of *Rhaconotus concinnus* (Enderlein), *Rh. sauteri* (Watanabe), *Rh. sulciventris* (Enderlein), *Leptospathius triangulifera* Enderlein, *Spathius annuliventris* (Enderlein) and *S. mimeticus* (Enderlein) are given. New synonyms: *Spathiohormius sauteri* Watanabe, 1934 = *Rhaconotus cleantes* Nixon, 1939; *Hormiopterus sulciventris* Enderlein, 1912 = *Rhaconotus oryzae* Wilkinson, 1929 = *Rh. flavistigma* Telenga, 1941; *Stenophasmus apicalis* Westwood, 1882 = *S. enderleini* Strand, 1913. *Euryphrymnus* Cameron is considered as subgenus of *Rhaconotus* Ruthe. Lectotypes of *Hormiopterus sulciventris* Enderlein, 1912, *Neotrimorus bicolor* Enderlein, 1912, *Leptospathius triangulifera* Enderlein, 1914 and *Stenophasmus mimeticus* Enderlein, 1912 are designated. The new combination is established: *Ipodoryctes rubriceps* (Cameron) (from *Rhyssalus*). 17 species are recorded for Taiwan for the first time. Keys to the Taiwanese genera and species of Doryctinae are given.

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Introduction

This is the second paper on Taiwanese braconids, chiefly based upon material from American Entomological Institute, Gainesville, USA (AEI). The first paper (Belokobylskij, 1988) dealt with the subfamily Exothecinae. In addition to the AEI material, specimens from the following collections keeping Taiwanese or Oriental braconids were examined: Texas A & M University, College Station, USA (TAMU), Deutsches Entomologisches Institut, Eberswalde, BRD (DEI), Museum für Naturkunde an der Humboldt-Universität zu Berlin, BRD (ZMB), Institute of Zoology, Warsaw, Poland (IZW), Natural History Museum, London, UK (BMNH), Hope Entomological Collections of the University Museum, Oxford, UK (OUM), Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZIP). 16 genera and 41 species (including 10 species new to science) are recorded from Taiwan Island in this paper.

Key to the Taiwanese genera of Doryctinae

- 1(24). 1st abdominal tergite not petiolate; wide and short; its acrosternite short, 0.2-0.25 times as long as tergite, and not fused with it laterally. Dorsople of 1st tergite distinct and deep.
- 2(23). Nervellus of hind wing present, submedial cell closed. Maxillary palpi 6-segmented; labial palpi 4-segmented.
- 3(18). Brachial cell of fore wing closed distally. Both radiomedial veins always present. Hind wing of male without stigma-like enlargement.
- 4(17). Recurrent vein of hind wing short, usually straight and directed towards base of wing. Frons flat and without median keel. 3rd segment of labial palpi long. Hind coxa usually without pointed processes dorsally. (Tribe Doryctini).
- 5(8). 5th or 6th abdominal tergite large, covering following (apical) tergites, entirely sculptured. Femora with distinct antero-dorsal tubercles.
- 6(7). Parallel vein interstitial. Abdomen usually with 5, rarely 6 visible tergites. 2nd abdominal tergite without basal area. (See also couplet 9) **Rhaconotus** Ruthe
- 7(6). Parallel vein not interstitial, arising from anterior third, rarely from posterior third or middle of distal side of brachial cell. Abdomen al-

- ways with 6 visible tergites. 2nd abdominal tergite usually with basal area **Ipodoryctes** Granger
- 8(5). 5th and 6th abdominal tergites not enlarged, not covering following (apical) tergites; tergites in apical part of abdomen usually smooth. Femora usually without antero-dorsal tubercles.
- 9(10). Parallel vein interstitial. 2nd abdominal tergite with lens-shaped apical area. (See also couplet 5) **Rhaconotus** Ruthe
- 10(9). Parallel vein not interstitial. 2nd abdominal tergite without lens-shaped apical area.
- 11(12). 1st abscissa of mediocubital vein of hind wing 0.3-0.33 times as long as 2nd abscissa. Recurrent vein postfurcal. Fore tibia without spines or with very fine spines **Halycaea** Cameron
- 12(11). 1st abscissa of mediocubital vein of hind wing nearly as long as 2nd abscissa, sometimes slightly longer or shorter. Recurrent vein antefurcal, rarely interstitial. Fore tibia with distinct spines.
- 13(14). Mesoscutum weakly and obliquely raised above pronotum. Collare of pronotum dorsally with convex lobe. Ocelli usually in obtuse triangle (its base distinctly longer than sides) **Doryctes** Haliday
- 14(13). Mesoscutum highly and usually almost vertically raised above pronotum. Collare of pronotum dorsally without convex lobe. Ocelli usually in equilateral triangle.
- 15(16). 2nd abdominal tergite usually with deep V-like depressions or (rarely) pale lines bounding basal triangular area. Usually 1st-3rd abdominal tergites entirely and 4th-6th tergites in basal thirds or halves sculptured **Hypodoryctes** Kokujev
- 16(15). 2nd abdominal tergite without depressions or pale lines bounding triangular basal area. At most 1st-3rd abdominal tergites sculptured, but usually 3rd tergite and (often) most of 2nd tergite smooth **Ontsira** Cameron
- 17(4). Recurrent vein of hind wing long and strongly curved towards distal margin of wing. Frons concave and with median keel. 3rd segment of labial palpi shortened. Hind coxa with 2 pointed processes dorsally. (Tribe Holcobraconini) **Zombrus** Marshall
- 18(3). Brachial cell of fore wing open distally because brachial vein lost. 2nd or 1st radiomedial vein often lost or strongly reduced. Hind wing of male usually with stigma-like enlargement of costal, medial and basal veins.
- 19(20). 1st radiomedial vein absent or strongly reduced. 2nd radiomedial vein always present. (Tribe Heterospilini) **Heterospilus** Haliday
- 20(19). 1st radiomedial vein always present. 2nd radiomedial vein present or lost. (Tribe Hecabolini). – Hind wing of male without stigma-like enlargement.
- 21(22). 2nd radiomedial vein present. Radial vein arising before or from middle of pterostigma. Radial cell not shortened. Abdomen without Y-like figure. Thorax not depressed **Parallorhogas** Marsh
- 22(21). 2nd radiomedial vein lost. Radial vein arising from apical third of pterostigma. Radial cell shortened. Abdomen with Y-like figure. Thorax strongly depressed **Polystenus** Förster
- 23(2). Nervellus of hind wing lost, submedial cell widely open. Maxillary palpi 5-segmented; labial palpi 3-segmented. (Tribe Ecphylini) **Ecphyllus** Förster
- 24(1). 1st abdominal tergite petiolate: long and narrow; its acrosternite considerably lengthened, 0.33-0.8 (rarely only 0.3) times as long as tergite, and fused with it laterally. Dorsople of 1st tergite absent or fine.
- 25(26). Propodeal bridge present. 1st flagellar segment of antenna shorter than 2nd segment. (Tribe Stephaniscini) .. **Leptospathius** Szépligeti
- 26(25). Propodeal bridge absent. 1st flagellar segment of antenna longer than 2nd segment. (Tribe Spathiini).
- 27(28). 2nd radiomedial vein absent. Abdomen with Y-like figure. Brachial cell open distally **Spathiostenus** Belokobyl'skij
- 28(27). 2nd radiomedial vein present. Abdomen without Y-like figure. Brachial cell closed distally.
- 29(30). Recurrent vein antefurcal. Mesoscutum smooth. – Hind coxa with distinct basoventral tooth **Spathiomorpha** Tobias
- 30(29). Recurrent vein postfurcal. Mesoscutum granulate.
- 31(32). Acrosternite of 1st abdominal tergite rather short, about one-third of 1st tergite length, reaching to level of spiracles. 1st abdominal tergite densely and finely reticulate throughout. – Parallel vein interstitial ... **Platyspathius** Gahan
- 32(31). Acrosternite of 1st abdominal tergite long, 0.6-0.7 times as long as 1st tergite, reaching to apical third of tergite. 1st abdominal tergite distinctly striate, without reticulation **Spathius** Nees

Tribe DORYCTINI

Genus *Rhaconotus* Ruthe, 1854

Rhaconotus is a large and polymorphic genus. Most species (about 55) of this genus were described or recorded from the Oriental and Afrotropical regions. Five species of *Rhaconotus* are recorded from Taiwan Is. in this paper, including 3 described in other genera (Enderlein, 1912; Watanabe, 1934).

Key to the Taiwanese species of *Rhaconotus*

- 1(2). 2nd abdominal tergite in posterior half or third with sculptured lens-shaped area bounded by deep furrows (Subgenus *Euryphrymnus* Cameron). – Temple half as long as transverse diameter of eye. Vertex densely granulate. Body length 2.3-2.8 mm **R.(E.) concinnus** (Enderlein)
- 2(1). 2nd abdominal tergite in posterior half without sculptured lens-shaped area, sometimes with

- fine transverse depression or narrow transverse smooth area. (Subgenus *Rhaconotus* s. str.).
- 3(4). Mesoscutum sparsely setose laterally and along notauli only. 1st-4th abdominal tergites distinctly carinate laterally above spiracles; sides of tergites more or less at right angles with dorsal surface of tergites. Pterostigma dark brown, pale basally and apically. – Abdomen with 5 visible tergites only. Propodeum without carinated areas, entirely and densely granulate. Body length 3.3-3.7 mm . . . **R.(R.) sauteri** (Watanabe)
- 4(3). Entire mesoscutum densely setose. 1st-4th abdominal tergites not carinate laterally and roundly curved at sides. Pterostigma pale brown or yellow.
- 5(6). Abdomen with 5 visible tergites. 2nd tergite without smooth transverse area posteriorly. Propodeum without marginate basolateral areas. Body usually pale reddish brown. Body length 3.4-3.9 mm. . . . **R.(R.) sulciventris** (Enderlein)
- 6(5). Abdomen with 6 visible tergites. 2nd tergite with narrow transverse smooth area posteriorly. Propodeum with distinctly marginate basolateral areas. Body black or dark reddish brown.
- 7(8). 2nd abdominal tergite shorter, its length about 3 times less than its basal width. Body length 2.8-3.7 mm . . . **R.(R.) vagrans** (Bridwell)
- 8(7). 2nd abdominal tergite longer, its length 2.1-2.6 times less than its basal width. Body length 1.8-5.2 mm **R.(R.) formosanus** Watanabe

Rhaconotus (Euryphrynus) concinnus
(Enderlein)
(Figs 1-10)

Enderlein, 1912: 23 (*Chremylus*; lectotype (Belokobyl'skij, 1994a): ♀, "Formosa, Takao, H. Sauter S. 21.IV.[19]07", "Type" (red), "*Chremylus concinnus* Enderl. ♀, Type, Dr. Enderlein det. 1912"; IZW; examined); Watanabe, 1937: 43 (*Chremylus*); Shenefelt, 1975: 1156 (*Chremylus*); Belokobyl'skij, 1994a: 341.

Material. Taiwan: 1 ♀, holotype. Vietnam: 12 ♀, prov. Gia Lai-Con Tum, 20 km N Buon-Luoi, Tram Lap, 21-30.XI. and 1-14.XII.1988 (A. Sharkov); 4 ♀, prov. Gia Lai-Con Tum, Kannack, 8-16.XI.1988 (A. Sharkov); 1 ♀, Hanoi, 29.III.-5.IV.1986 (A. Sharkov); 1 ♀, prov. Bac Thai, Phu Luong, 20 km N Thai Nguen, Quang Chu, 16-23.IV. 1986 (A. Sharkov); 2 ♀, prov. Ha Son Binh, Da Bac, Tuly, 17 and 21. X.1990 (E. Sugonyaev); 1 ♀, prov. Ha Son Binh, Da Bac, Ky Son, Cao Phong, forest, 29.X.1990 (E. Sugonyaev). China: 1 ♀, prov. Guangdong, Guangzhou, grass, 16.VI.1989 (E. Sugonyaev).

Description. Female. Body length 2.5-3 mm; fore wing length 2.2-2.5 mm. Head width 1.5 times its median length. Temple roundly narrowed behind eye, 0.4-0.5 times as long as transverse diameter of eye. Ocelli small, in equilateral triangle; POL 0.7-0.9 times Od, 0.25-0.3 times OOL. Eye 1.1 times as high as broad. Cheek height 0.33-0.35

times height of eye, 0.75-0.9 times basal width of mandible. Face width nearly equal to height of eye and 1.2-1.4 times height of face and clypeus combined. Subocular suture absent. Hypoclypeal depression round, its width 0.7-1 times distance from edge of depression to eye. Occipital carina not fused with hypostomal one near mandible.

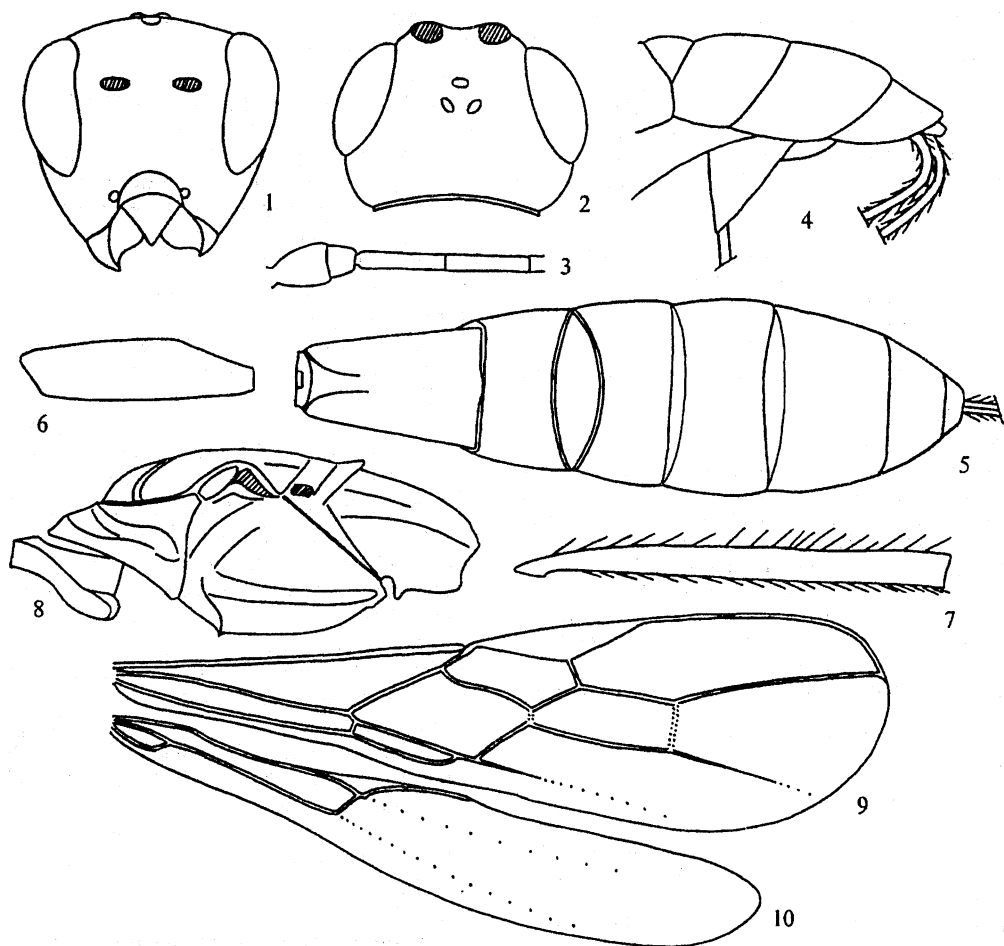
Antennae filiform, 23-28-segmented. 1st flagellar segment 4.8-5.5 times as long as its apical width, as long as 2nd segment. Penultimate segment 3-4 times as long as wide, 0.9 times as long as apical segment.

Thorax. Length 2.1-2.25 times its height. Pronotal carina distinct and not fused medially with posterior margin of pronotum. Mesoscutum slightly and roundly raised above prothorax. Notauli deep and crenulate. Mesoscutum with shallow median longitudinal depression. Prescutellar depression distinct, 0.25-0.3 times as long as scutellum. Sternauli deep, granulate with crenulae, running along almost entire lower part of mesopleura, connected with lower edge of subalar depression anteriorly.

Wings. Length of fore wing 3.5-3.8 times its maximum width. Radial cell not shortened. Metacarpus 1.4-1.5 times as long as pterostigma. Radial vein arising from middle of pterostigma. 2nd radial abscissa 3.3-4 times 1st abscissa, 0.5-0.6 times 3rd abscissa, 1.8-2 times 1st radiomedial vein. 2nd radiomedial cell not widened distally, its length 2.7-2.8 times its maximum width, 1.4-1.7 times length of brachial cell. 1st medial abscissa distinctly S-shaped. Mediocubital vein finely curved to anal vein. Distance from nervulus to basal vein 0.7-1 times nervulus length. Brachial cell closed distinctly before recurrent vein. In hind wing, 1st abscissa of mediocubital vein 0.3 times 2nd abscissa. Recurrent vein absent.

Legs. Hind femur without antero-dorsal protuberances, its length 3.7-4 times its width. Hind tarsus almost as long as hind tibia; hind basitarsus 0.6 times combined length of 2nd-5th segments. 2nd tarsal segment nearly half as long as basitarsus, 1.1-1.3 times as long as 5th segment (without pretarsus).

Abdomen slightly longer than head and thorax combined, with 5 visible tergites, but usually also 6th tergite shortly projecting. Apical width of 1st tergite 2.2-2.4 times its basal width, its length 1.3-1.5 times its apical width. 2nd tergite with distinct concavely curved transverse furrow and oval area, this area 0.8-1 times as long as rest of tergite.



Figs 1-10. *Rhaconotus concinnus* (Enderlein). 1, head, frontal view; 2, head, dorsal view; 3, 4 basal segments of antenna; 4, apical part of abdomen, lateral view; 5, abdomen, dorsal view; 6, hind femur; 7, hind tibia; 8, thorax, lateral view; 9, fore wing; 10, hind wing.

Median length of 2nd tergite slightly less than its basal width, 1.7-2 times length of 3rd tergite. 5th tergite rather large, almost straight at posterior margin, without median emargination and ventro-posterior lobes. 5th tergite 1.2-1.3 times as long as 4th tergite, 1.5-1.7 times as long as 3rd tergite. Ovipositor sheath 0.4-0.5 times as long as abdomen, 1.5-1.8 times as long as 1st tergite, 0.25-0.3 times as long as fore wing.

Sculpture and pubescence. Head densely granulate; cheek and face medially almost smooth. Mesothorax densely granulate entirely. Propodeum densely and finely granulate, with sparse rugae in posterior half and distinct median carina in anterior half, with-

out marginate areas. 1st-4th abdominal tergites striate; 5th tergite with fine and interrupted striae; 6th tergite finely reticulate basally; 3rd and 4th tergites posteriorly, 5th tergite in distal third and 6th tergite at most part (almost) smooth. Vertex with short semi-erect yellow hairs directed forward. Mesonotum mostly bare, with rather dense and semi-erect light hairs along notauli, medioposteriorly and laterally. Hind tibia with semi-erect hairs dorsally; length of these hairs slightly less than maximum width of hind tibia, nearly equal to length of ventral hairs.

Colour. Body reddish brown, head paler. Antennae dark reddish brown. Palpi yellow.

Legs pale brown. Wings hyaline. Pterostigma yellow.

Male unknown.

Discussion. This species is related to *R. nadezhdae* (Tobias & Belokobyl'skiy) from Russian Far East and differs by having the head densely granulate, 2nd abdominal tergite long, mesopleurae granulate, and brachial cell closed before recurrent vein.

Distribution. Taiwan, China, Vietnam.

Rhaconotus sauteri (Watanabe), comb. n.
(Figs 11-19)

Watanabe, 1934 : 189 (*Spathiohormius*; holotype: ♀, "Anping, Formosa, H. Sauter", "7 VIII", "*Spathiohormius sauteri* Watanabe ♀, Type"; DEI, examined); 1937: 43; Shenefelt & Marsh, 1976: 1385 (*Platyspathius*).

Rhaconotus cleantes Nixon, 1939: 125 (holotype: ♀, South India, Kuniyamuthur, 25.VI.1938; BMNH), syn. n.; Shenefelt & Marsh, 1976: 1336.

Material. **Taiwan:** 1 ♀, holotype; 1 ♀ (paratype), "Tainan, Formosa, H. Sauter, IV. [19]12", "Paratype", "*Spathiohormius sauteri* Watanabe, ♀, det. C. Watanabe"; 1 ♀, "Taihorin, Formosa, H. Sauter, 1911", "7.XI."; 2 ♀, Wufeng, 20.III. and 10.IV.1983 (H. & M. Townes). **Vietnam:** 3 ♀, Hanoi, meadow, 1. and 3.XI.1988 (A. Sharkov); 2 ♀, prov. Ha Son Binh, Da Bac, Tuly, forest, bamboo, 22.X.1990 (E. Sugonyaev); 2 ♀, same locality, 18. and 22.X.1990 (S. Belokobyl'skiy); 3 ♀, prov. Ha Son Binh, Ky Son, Cao Phong, 26. and 27.X.1990 (E. Nartshuk).

Description. Female. Body length 2.8-3.7 mm; fore wing length 2.3-2.5 mm. Head width 1.4-1.7 times its median length. Temple distinctly roundly narrowed behind eye, 0.5-0.6 times as long as transverse diameter of eye. Ocelli small, in equilateral triangle; POL 0.8-1.2 times Od, 0.25-0.4 times OOL. Eye 1.3 times as high as broad. Cheek height 0.5-0.6 times height of eye, 0.9-1.4 times basal width of mandible. Face width 1.1-1.2 times height of eye and 1.3 times height of face and clypeus combined. Subocular suture very fine or absent. Hypoclypeal depression small and round, its width 0.6-0.7 times distance from edge of depression to eye. Occipital carina not fused with hypostomal one near mandible.

Antennae filiform, 31-37-segmented. 1st flagellar segment 4-4.5 (rarely 5) times as long as its apical width, 1-1.2 times as long as 2nd segment. Penultimate segment 4-5 times as long as wide, nearly as long as apical segment.

Thorax. Length 2.3-2.4 times its height. Pronotal carina distinct and not fused medially with posterior margin of pronotum.

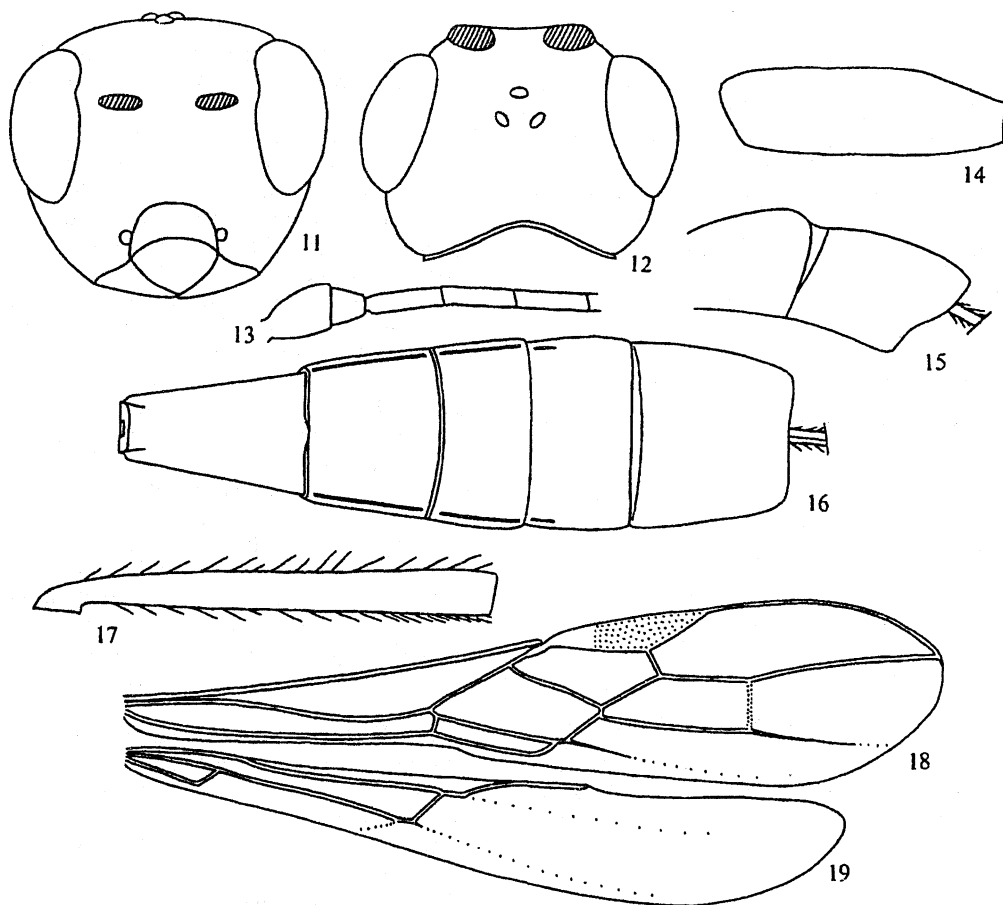
Mesoscutum slightly and roundly raised above prothorax. Notauli deep and granulate. Median lobe without longitudinal depression. Prescutellar depression distinct, with median carina, granulate, 0.25-0.33 times as long as scutellum. Sternauli shallow, granulate, running along almost entire lower part of mesopleura, connected with lower edge of subalar depression anteriorly.

Wings. Length of fore wing 4.5-5 times its maximum width. Radial cell not shortened. Metacarpus 1.3-1.4 times as long as pterostigma. Radial vein arising slightly behind middle of pterostigma. 2nd radial abscissa 3-3.8 times 1st abscissa, 0.4-0.5 times 3rd abscissa, 1.3-1.4 times 1st radiomedial vein. 2nd radiomedial cell weakly widened distally, its length 2.8-3.5 times its maximum width, 1.3-1.5 times length of brachial cell. 1st medial abscissa distinctly S-shaped. Mediocubital vein distinctly curved to anal vein. Distance from nervulus to basal vein 0.5-1 times nervulus length. Brachial cell usually closed slightly before recurrent vein. In hind wing, 1st abscissa of mediocubital vein about 0.4 times 2nd abscissa. Recurrent vein unsclerotized, indistinct.

Legs. Hind femur with small antero-dorsal protuberances, its length 3.3-3.7 times its width. Hind tarsus as long as hind tibia; hind basitarsus 0.7-0.75 times combined length of 2nd-5th segments. 2nd tarsal segment 0.4-0.5 times as long as basitarsus, 1.2-1.5 times as long as 5th segment (without pretarsus).

Abdomen 1.2-1.3 times longer than head and thorax combined, with 5 visible tergites. Apical width of 1st tergite 2.2-2.5 times its basal width, its length 1.3-1.5 times its apical width. 2nd tergite without apical area and furrows, its median length almost equal to basal width, 1.4-1.7 times length of 3rd tergite. 5th tergite weakly roundly concave medially or almost straight at posterior margin, slightly emarginate medially, with distinct lateral lobe ventro-posteriorly. 5th tergite 1.4-1.5 times longer than 4th tergite, 1.8-1.9 times longer than 3rd tergite. 1st-3rd tergites entirely and 4th tergite partly carinate laterally, its sides more or less at right angles with dorsal surface of tergites. Ovipositor sheath 0.5-0.6 times as long as abdomen, 1.8-2.4 times as long as 1st tergite, 0.37-0.44 length of fore wing.

Sculpture and pubescence. Head entirely and densely granulate, without distinct rugae. Mesonotum densely and finely granulate, without rugae near notauli. Propodeum



Figs 11-19. *Rhaconotus sauteri* (Watanabe). 11, head, frontal view; 12, head, dorsal view; 13, 5 basal segments of antenna; 14, hind femur; 15, apical part of abdomen, lateral view; 16, abdomen, dorsal view; 17, hind tibia; 18, fore wing; 19, hind wing.

densely granulate, with 3 distinct longitudinal carinae in basal two-thirds, without carinate areas. Abdomen entirely and densely reticulate, basal tergites sometimes with very sparse rugae, at least basally. Vertex with sparse white semi-erect hairs. Mesonotum with long, light and erect hairs along notauli and laterally only. Hind tibia with semi-erect hairs dorsally, these hairs shorter than maximum width of hind tibia, longer than ventral hairs.

Colour. Body reddish brown. Head and legs pale reddish brown. Antennae pale brown basally, darkened towards apex. Palpi yellow. Wings finely infusate, with hyaline bands. Pterostigma dark brown, pale in basal third and apically.

Male unknown.

Discussion. This species is related to *R. aciculatus* Ruthe and differs by having the 1st-4th tergites with distinct longitudinal lateral carinae, ventro-posterior part of the 5th tergite with lateral tooth, basal antennal segments thicker and shorter, 2nd abdominal tergite longer.

Host. *Pempheres affinis* Faust. (Curculionidae) (Nixon, 1939).

Distribution. Taiwan, Vietnam (new record), India.

***Rhaconotus sulcativentris* (Enderlein)**

(Figs 20-29)

Enderlein, 1912: 24 (*Hormiopterus*; lectotype: ♀, "Formosa, Takao, H. Sauter S. 26.III.[19]07", "Type" (red), "*Hormiopterus sulcativentris* Enderl. ♀, Type, Dr. Enderlein det. 1912"; IZW; here designated);

Watanabe, 1937: 44 (*Hormiopterus*); Shenefelt & Marsh, 1976: 1342.

Rhaconotus oryzae Wilkinson, 1929: 205 (lectotype (Belokobyl'skij, 1990a): ♀, "Type", "B. M. Type Hym. 3c.166", "*Rhaconotus oryzae* Wilkinson, Type", "A. out of borers. hibernating in rice stubble", "India, Punjab, 16.II.1929 (D.G. Khan a. Singh)"; BMNH; examined), *syn. n.*; Nixon, 1941: 482; Shenefelt & Marsh, 1976: 1340; Belokobyl'skij, 1990a: 159.

Rhaconotus flavistigma Telenga 1941: 68 (lectotype (Belokobyl'skij & Tobias, 1986): ♀, Tadjikistan, "Dzhili-kul' na Vakhsh", 15.VI.1934 (Gussakovskiy); ZIP; examined), *syn. n.*; Shenefelt & Marsh, 1976: 1337; Belokobyl'skij & Tobias, 1986: 46; Belokobyl'skij, 1990a: 159.

Material. Taiwan: 1 ♀, lectotype of *H. sulcativentris*; 1 ♀, "Formosa, Takao, H. Sauter S., 15.V. [19]07", "Co-Typus", "*Hormiopterus sulcativentris* Enderl. ♀, Type, Dr. Enderlein det. 1912" (paralectotype); 1 ♀, same locality and labels, but 5.VII.1907 (paralectotype); 1 ♀, "Formosa, Takao, H. Sauter S., 10.4.[19]07". **Vietnam:** 1 ♀, prov. Gia Lai-Con Tum, Buon Luoi, grass, 16.VI.1982 (Gue); 1 ♀, prov. Gia Lai-Con Tum, 20 km N Buon Luoi, Tram Lap, 1-14.XII.1988 (A. Sharkov); 1 ♀, prov. Ha Son Binh, Ky Son, Cao Phong, forest, 25. X.1990 (S. Belokobyl'skij). **India:** 1 ♀, lectotype of *Rh. oryzae*. **Tadjikistan:** 1 ♀, lectotype of *Rh. flavistigma*.

Description. Female. Body length 3.5-3.9 mm; fore wing length 2.8-3 mm. Head width 1.5-1.6 times its median length. Temple roundly narrowed behind eye, 0.5-0.6 times as long as transverse diameter of eye. Ocelli small, in equilateral triangle; POL 0.7-1 times Od, 0.2-0.35 times OOL. Eye 1.2 times as high as broad. Cheek height about 0.5-0.6 times height of eye, 0.8-1.1 times basal width of mandible. Face width 1.2-1.3 times height of eye and 1.4-1.6 times height of face and clypeus combined. Subocular suture very fine or absent. Hypoclypeal depression small and round, its width 0.5-0.6 times distance from edge of depression to eye. Occipital carina not fused with hypostomal one near mandible.

Antennae filiform, 33-38-segmented. 1st flagellar segment 3.8-4.3 times as long as its apical width, slightly longer than 2nd segment. Penultimate segment 3-4 times as long as wide, 0.9-1 times as long as apical segment.

Thorax. Length 2.1-2.3 times its height. Pronotal carina very fine and not fused with posterior margin of pronotum. Mesoscutum slightly and roundly raised above prothorax. Notauli deep, shallow posteriorly, crenulate. Mesoscutum with shallow median longitudinal depression. Prescutellar depression distinct, finely sculptured, 0.25-0.35 times as

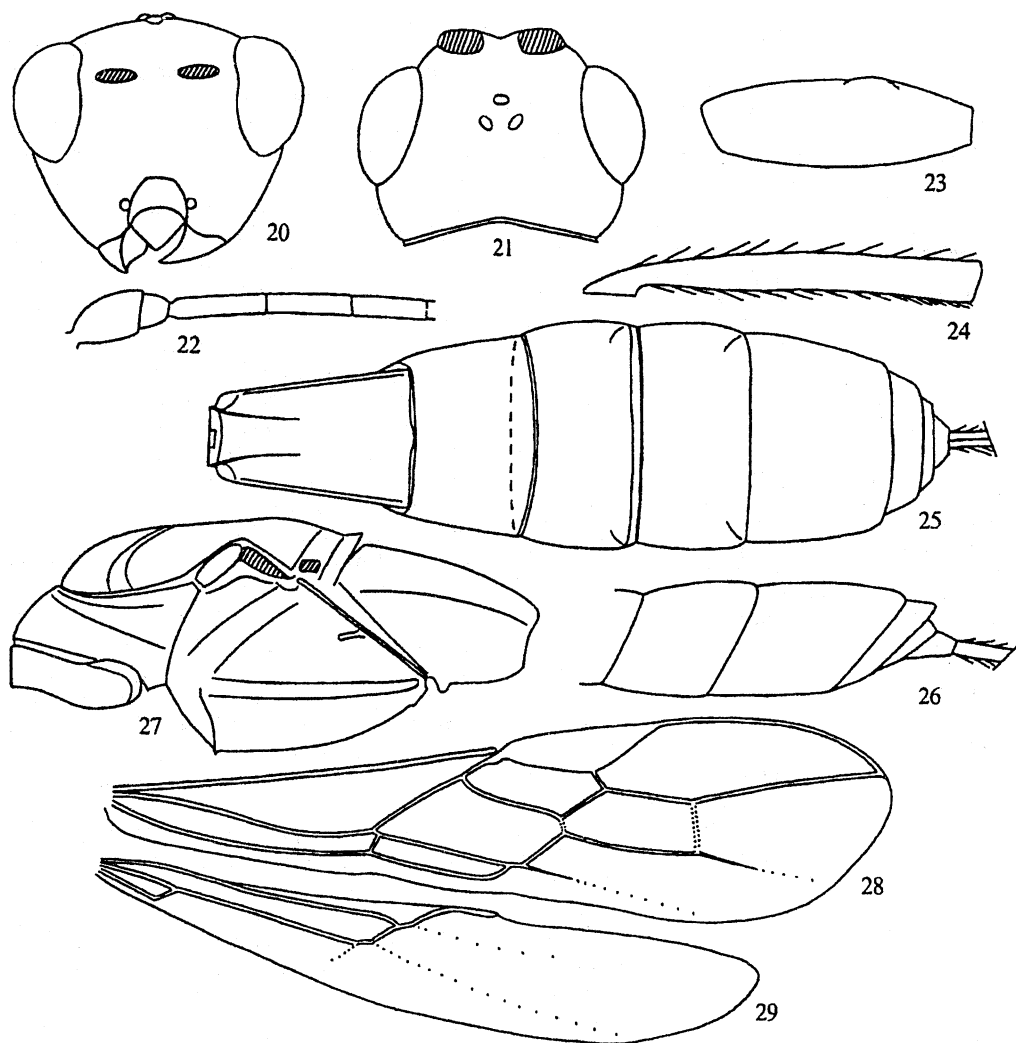
long as scutellum. Sternauli rather deep, sparsely crenulate with granulation, running along almost entire lower part of mesopleura, connected with lower edge of subalar depression anteriorly.

Wings. Length of fore wing 3.9-4.3 times its maximum width. Radial cell not shortened. Metacarpus 1.4-1.6 times as long as pterostigma. Radial vein arising from or slightly behind middle of pterostigma. 2nd radial abscissa 3.3-4.2 times 1st abscissa, 0.4-0.5 times 3rd abscissa, 1.5-1.8 times 1st radiomedial vein. 2nd radiomedial cell not widened distally, its length 2.6-3 times its maximum width, 1-1.3 times length of brachial cell. 1st medial abscissa distinctly S-shaped. Mediocubital vein finely curved to anal vein. Distance from nervulus to basal vein 0.3-0.7 times nervulus length. Brachial cell closed slightly before recurrent vein. In hind wing, 1st abscissa of mediocubital vein 0.4-0.5 times 2nd abscissa. Recurrent vein unsclerotized, indistinct.

Legs. Hind femur with small antero-dorsal protuberances, its length 3-3.2 times its width. Hind tarsus almost as long as hind tibia; hind basitarsus 0.6 times as long as 2nd-5th segments combined. 2nd tarsal segment 0.5-0.7 times as long as basitarsus, 1.2-1.3 times as long as 5th segment (without pretarsus).

Abdomen slightly longer than head and thorax combined, with 5 visible tergites. Apical width of 1st tergite 2.2-2.6 times its basal width, its length 1.2-1.4 times its apical width. 2nd tergite without apical area and furrow or very shallow transverse furrow present at posterior fifth, median length of tergite 0.6-0.8 times basal width, 1.2-1.4 times length of 3rd tergite. 5th tergite rather large, weakly rounded or almost straight at posterior margin, without median emargination and ventro-posterior lobes. 5th tergite 1.3-1.5 times longer than 4th tergite, 1.4-1.5 times longer than 3rd tergite. 6th tergite weakly extending beyond 5th tergite. Tergites not carinate laterally, with rounded sides. Ovipositor sheath 0.4-0.45 times as long as abdomen, 1.4-1.7 times as long as 1st tergite, 0.3-0.33 length of fore wing.

Sculpture and pubescence. Head entirely and densely granulate. Mesonotum densely granulate, without rugae near notauli, sparsely rugulose medio-posteriorly. Propodeum densely granulate, with distinct longitudinal median carina in basal half, without marginate areas. 1st-4th abdominal



Figs 20-29. *Rhaconotus sulcativentris* (Enderlein). 20, head, frontal view; 21, head, dorsal view; 22, 5 basal segments of antenna; 23, hind femur; 24, hind tibia; 25, abdomen, dorsal view; 26, apical part of abdomen, lateral view; 27, thorax, lateral view; 28, fore wing; 29, hind wing.

tergites striate, 3rd and 4th tergites finely sculptured posteriorly. 5th tergite striate in basal third, rest of tergite densely and finely reticulate. Vertex with rather dense yellowish semi-erect hairs. Mesonotum almost entirely with dense short semi-erect light hairs, sometimes narrow line of middle lobe and constantly medial parts of lateral lobes bare. Hind tibia with semi-erect hairs dorsally, these hairs 0.4-0.55 times as long as maximum width of hind tibia, distinctly shorter than ventral hairs.

Colour. Body pale or sometimes dark reddish brown, head paler. Antennae pale reddish brown, darkened towards apex. Palpi yellow. Legs pale or yellowish brown. Wings hyaline. Pterostigma pale yellow.

Male unknown.

Discussion. This species is related to *R. scirpophagae* Wilkinson from India and differs by having the 1st abdominal tergite narrower and longer, 2nd radiomedial cell not widened apically, ovipositor sheath shorter, and vertex distinctly convex.

Distribution. Taiwan, Vietnam (new record), India, Tadjikistan.

finely and linearly striate. Middle tibia pale basally. 3.8-5 mm **I. korotyaevi** sp. n.

Rhaconotus vagrans (Bridwell)

Shenefelt & Marsh, 1976: 1342; Belokobylskij, 1994a: 347.

Material. **Taiwan:** 1 ♀, Wushe, 1150m, 10.V.1983 (H. Townes). **Vietnam:** 1 ♀, prov. Gia Lai-Con Tum, 20 km N Kannack, Tram Lap, 1-14.III.1988 (A. Sharkov).

Distribution. Hawaii, Vietnam (new record), Taiwan (new record).

Rhaconotus formosanus (Watanabe)

Rhaconotus formosanus Watanabe, 1934: 119 (holotype: ♀, "Kankau (Koshun), Formosa, H. Sauter, 1912", "22.IV.", "*Rhaconotus formosanus* Watanabe, Type"; DEI; examined); Shenefelt & Marsh, 1976: 1337; Belokobylskij, 1994a: 344 (redescription).

Material. **Taiwan:** 1 ♀, holotype; 1 ♀, "Takao, Formosa, 21.4.[19] 07, Hans Sauter"; 1 ♂, "Taiwan: Kenting, 26-31.VIII.1983, J.B. Heppner, light trap"; 1 ♀, Wushe, 1150 m, 16.III.1983 (H. Townes); 1 ♀, Wushe, 1150 m, 23.III.1983 (H. et M. Townes) (f. *flavistigmus* Belok.).

Distribution. Indonesia, Malaysia, Russia (south of the Far East), Taiwan, Vietnam.

Genus **Ipodoryctes** Granger, 1949

Ipodoryctes comprises 17 species from the Afrotropical and Oriental regions. Eight species were recorded from India, Vietnam and Taiwan (Belokobylskij, 1994b). I examined the lectotype of *Rhyssalus rubriceps* Cameron (♀, "Cotype", "J. Hewitt, Kuching", "*Rhyssalus* (sic!) *rubriceps* Cam., type, Borneo"; BMNH; here designated). This species also belongs to *Ipodoryctes* (comb. n.). Additionally, one new species is described in this paper.

Key to the Taiwanese species of *Ipodoryctes*

- 1(2). Posterior area of 2nd abdominal tergite rugulose. 6th tergite with shallow and wide emargination at posterior margin. Vertex rather sparsely, coarsely and in part undulately striate. Middle tibia dark brown or black basally. 4.8-7.6 mm **I. peregrinus** Belokobylskij
- 2(1). Posterior area of 2nd abdominal tergite smooth. 6th tergite with deep and narrow emargination at posterior margin. Vertex densely,

Ipodoryctes peregrinus Belokobylskij

Belokobylskij, 1994b: 130.

Material. **Taiwan:** 1 ♀, Sunmoon Lake, Malaise Trap, 6.XI.1968 (H. Townes) (paratype); 1 ♀, "Takao, Formosa, 21.4.[19]07, 6184, Hans Sauter".

Distribution. Taiwan, Vietnam.

Ipodoryctes korotyaevi sp. n.

(Figs 30-38)

Holotype. ♀, **Vietnam**, prov. Ha Son Binh, Mai Chao, forest, 31.X.1990 (S. Belokobylskij) (ZIP).

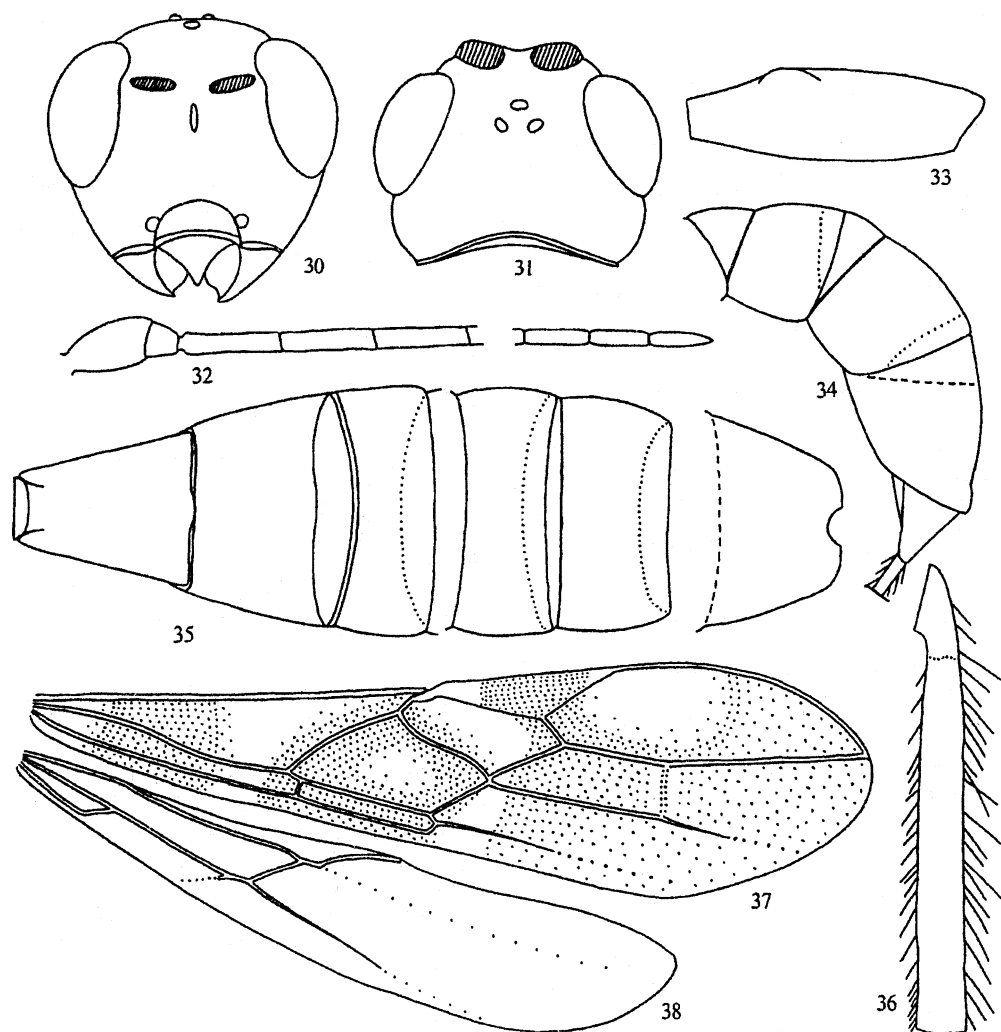
Paratypes. **Vietnam:** 1 ♀, 75 km NW Thanh Hoa, Ngoc Lac, shrubs, 13.I.1989 (B. Korotyaev) (ZIP); 1 ♀, prov. Ha Son Binh, Ky Son, Cao Phong, forest, 28.X.1990 (S. Belokobylskij) (ZIP); **Taiwan:** 1 ♀, Wushe, 1150 m, 23.III.1983 (H. & M. Townes) (AEI).

Description. Female. Body length 3.8-5 mm; fore wing length 3.2-3.6 mm. Head width 1.4-1.5 times its median length. Temple anteriorly weakly convex, posteriorly almost linearly narrowed behind eye, its length 0.4-0.5 times transverse diameter of eye. Ocelli small; ocellar triangle with base 1.2-1.3 times its sides. POL 1-1.3 times Od, almost half OOL. Eye 1.2 times as high as broad. Cheek height 0.4-0.5 times height of eye and nearly equal to basal width of mandible. Face width nearly equal to eye height and slightly greater than height of face and clypeus combined. Hypoclypeal depression round, its width 0.8-0.9 times distance from edge of depression to eye. Occipital carina fused with hypostomal one near mandible.

Antennae slender, filiform, 34-38-segmented, 1.5 times longer than body. Scapus 1.6-1.8 times as long as its maximum width. 1st flagellar segment 4.5-5 times as long as its apical width, 1.1 times as long as 2nd segment. Penultimate segment 4.5-5.5 times as long as wide, almost as long as apical segment, the latter without apical spine.

Thorax. Length about twice its height. Mesoscutum slightly and roundly raised above prothorax. Notauli rather deep, complete, crenulate. Prescutellar depression deep, rugulose, with distinct median carina, 0.3-0.4 times as long as scutellum. Sternauli deep, long, smooth.

Wing. Length of fore wing 3.7-3.9 times its maximum width. Metacarpus 1.4-1.5 times as long as pterostigma. Radial vein arising



Figs 30-38. *Ipodoryctes korotyaevi* sp. n. 30, head, frontal view; 31, head, dorsal view; 32, basal and apical segments of antenna; 33, hind femur; 34, apical part of abdomen, lateral view; 35, abdomen, dorsal view; 36, hind tibia; 37, fore wing; 38, hind wing.

slightly behind middle of pterostigma. 2nd radial abscissa 3.2-3.7 times 1st abscissa, 0.5-0.6 times 3rd abscissa, 1.3-1.5 times 1st radiomedial vein. Length of 2nd radiomedial cell 3.2-3.6 times its maximum width, 1.3-1.4 times length of brachial cell. 1st medial abscissa distinctly S-shaped, 2nd abscissa very short. Recurrent vein almost interstitial or slightly postfurcal. Distance from nervulus to basal vein almost equal to nervulus length. Parallel vein not interstitial, arising from anterior third of distal

margin of brachial cell. In hind wing, 1st abscissa of mediocubital vein 0.55-0.7 times 2nd abscissa. Recurrent vein antefurcal.

Legs. Femora with distinct protuberances in anterodorsal third. Hind femur 3.2-3.4 times as long as wide. Hind tarsus 1.1-1.2 times longer than hind tibia. 2nd tarsal segment about 0.4 times as long as basitarsus and 1.2-1.3 times as long as 5th segment (without pretarsus); basitarsus 0.8-0.9 times as long as 2nd-5th segments combined.

Abdomen 1.4-1.5 times as long as head and thorax combined, with 6 visible tergites. Apical width of 1st tergite 2.2-2.4 times its minimum width, 0.8-0.9 times its length. 2nd tergite without basal area, with distinct and narrow smooth area in posterior fifth; length of 2nd tergite 0.75-1 times its basal width, about twice length of 3rd tergite. 2nd suture deep and uniformly curved. 6th tergite rounded at posterior margin and with short and deep median emargination, 1.1-1.2 times as long as 5th tergite and 1.5 times as long as 4th tergite. Ovipositor sheath 1.1-1.3 times as long as abdomen, 5.5-6 times as long as 1st tergite, 2.2 times as long as thorax and 0.9 times as long as fore wing.

Sculpture and pubescence. Vertex densely linearly and rather finely transversely striate. Frons and face rugose with sparse striae. Temples and cheek smooth. Mesoscutum densely rugulose-striate, with granulation, median lobe granulate almost entirely; scutellum finely granulose-punctulate. Mesopleurae almost smooth, coarsely striate in upper third. Propodeum rugose in distal two-fifths, with two large marginate smooth or finely granulate basolateral areas. Hind coxae smooth, finely granulate dorsally. Hind femora distinctly striate dorsally. Abdomen almost entirely and distinctly striate. 2nd tergite almost smooth in distal area; 3rd-5th tergites smooth in posterior thirds. 6th tergite with dense and concentric striae. Thorax almost entirely (except areas of propodeum) with dense short yellowish hairs. Hairs of mesoscutum usually directed to its distal margin. Hind tibia with rather long erect hairs dorsally, their length 0.8-1 times maximum width of hind tibia.

Colour. Body black or dark reddish brown, thorax and abdomen with dark red spots. Head pale reddish brown, face darker. Antennae reddish brown, darkened towards apex. Palpi pale yellow. Tegulae light reddish brown. Legs yellow, hind coxae and 5th tarsal segments reddish brown, hind tibia basally and all basitarsi in basal half black. Wing infusate mainly along vein. Pterostigma dark brown, pale yellow in basal quarter and apically.

Male unknown.

Etymology. This species is named for Dr. B.A. Korotyaev, well-known Russian entomologist.

Discussion. Closely related to *I. peregrinus* Belok. (Belokobylskij, 1994b), the differences between these species are indicated in the key.

Genus *Halycaea* Cameron, 1903

Halycaea is a small genus, it comprises 3 species from the Oriental region (Shenefelt & Marsh, 1976; Achterberg & O'Toole, 1993). This genus is recorded from Taiwan for the first time.

Halycaea erythrocephala Cameron

Shenefelt & Marsh, 1976: 1375.

Material. Taiwan: 1 ♂, "Taihorin, Formosa, H. Sauter, II. [19]10".

Description. Male (nov.). Body length 6.5 mm; fore wing length 5.1 mm. Head width 1.4 times its median length. Transverse diameter of eye 1.2 times as long as temple. Occipital carina dorsally present, but slightly curved downwards. Cheek height 0.33 times height of eye, 0.7 times basal width of mandible. 1st flagellar segment 4 times as long as its apical width, 1.4 times 2nd segment. Length of thorax 2.6 times its height. Mesoscutum not highly, but almost vertically raised above prothorax. Notauli deep and crenulate. Sternauli shallow, but distinct, curved, crenulate, running along almost entire lower part of mesopleurae. In fore wing, recurrent vein almost interstitial. 2nd radiomedial cell 3.4 times as long as its maximum width, 0.9 times as long as brachial cell. 1st abscissa of mediocubital vein of hind wing 0.3 times as long as 2nd abscissa. Fore tibiae with very small spines. Hind coxa with very small basoventral tooth. Hind femur thickened, 2.8 times as long as maximum width. Hind basitarsus 0.8 times as long as 2nd-5th segments combined. Length of 1st abdominal tergite 2.2 times its apical width. Length of 2nd tergite 0.8 times its basal width. 2nd suture strongly curved forward. 3rd-5th tergites with deep, curved backwards furrows in basal halves.

Sculpture. Vertex smooth. Mesoscutum densely and finely granulate. Mesopleurae sparsely punctulate. Propodeum without marginate areas, entirely coarsely rugose. 1st abdominal tergite coarsely rugose with punctulation. Entire 2nd tergite and much of 3rd tergite very densely and finely punctulate. 4th and 5th tergites densely rugulose with punctulation in basal halves.

Colour. Body black. Head dark reddish brown. Legs light brown, hind coxa, femur and tibia medially strongly darkened. Wings faintly infusate. Pterostigma brown.

Distribution. Malaysia, Taiwan (new record).

Genus *Doryctes* Haliday, 1836

Doryctes comprises about 65 species. 15 species of this genus were recorded from the Palaearctic and 11 species are known from the Oriental region (Shenefelt & Marsh, 1976). *Doryctes* is recorded for Taiwan fauna for the first time.

Key to the Taiwanese species of *Doryctes*

- 1(2). Temple shorter; transverse diameter of eye 1.4-1.5 times as long as temple. 1st flagellar segment 5 times as long as its apical width. 2nd radiomedial cell 0.7-0.8 times as long as brachial cell. 1st abscissa of mediocubital vein of hind wing 0.7-0.8 times 2nd abscissa. Hind coxa with distinct dorsal tooth medially. 1st abdominal tergite longer, its length 1.4-1.6 times its apical width. 2nd tergite with distinct anterolateral depressions. Ovipositor sheath longer, 0.85-1 times as long as fore wing. Propodeum without areolation. Hind tibia with long hairs dorsally, their length 1.1-1.5 times maximum width of tibia. Body length 5.2-8 mm. Taiwan, Japan *D. denticoxa* sp. n.
- 2(1). Temple longer; transverse diameter of eye slightly shorter than temple. 1st flagellar segment 3.6-3.8 times as long as its apical width. 2nd radiomedial cell 1.4-1.6 times as long as brachial cell. 1st abscissa of mediocubital vein of hind wing 1.2-1.4 times 2nd abscissa. Hind coxa without dorsal tooth. 1st abdominal tergite shorter, its length 1.1-1.3 times its apical width. 2nd tergite without anterolateral depressions. Ovipositor sheath shorter, half as long as fore wing. Propodeum with distinctly marginate areas. Hind tibia with very short hairs dorsally, their length distinctly less than maximum width of tibia. Body length 5.4-6.7 mm. Taiwan *D. henryi* sp. n.

Doryctes denticoxa sp. n.

(Figs 39-47)

Holotype. ♀, Taiwan, "Kankau (Koshun), Formosa, H. Sauter, VII. 1912" (DEI).

Paratypes. Taiwan: 1 ♀, Wushe, 1150 m, 3.V.1983 (H. Townes) (AEI); 1 ♀ (without head), "Formosa, Taihorin, X.10, Sauter S.G." (ZMB); 1 ♂, "Kankau (Koshun), Formosa, H. Sauter 1912", "22.IV." (ZIP); 1 ♂, same label, "VI 1912" (DEI); 1 ♂, "Taiwan: Kenting, 26-31. VIII.1983, J.B. Heppner, light trap" (TUC). Japan: 1 ♂ Fukuoka, Konosuyama, Fukuoka-shi, 5.VII.1992 (V. Makarkin) (ZIP).

Description. Female. Body length 7.4-8 mm; fore wing length 6-6.5 mm. Head width 1.5 times its median length. Temple strongly roundly narrowed behind eye; transverse diameter of eye 1.4-1.5 times as long as temple. Ocelli small, in triangle with base 1.3-1.4 times its sides. POL 1.1-1.3 times Od, 0.6-0.7

times OOL. Eye 1.25 times as high as broad. Cheek height 0.25-0.3 times height of eye, 0.5-0.6 times basal width of mandible. Face width 0.8 times height of eye and 1.1-1.2 times height of face and clypeus combined. Subocular suture very shallow. Clypeus with narrow and almost perpendicular lower flange. Clypeal suture shallow. Hypoclypeal depression round, its width almost equal to or 1.2 times greater than distance from edge of depression to eye. Occipital carina below not fused with hypostomal one. Palpi long, length of maxillary palpi 1.3-1.5 times head height.

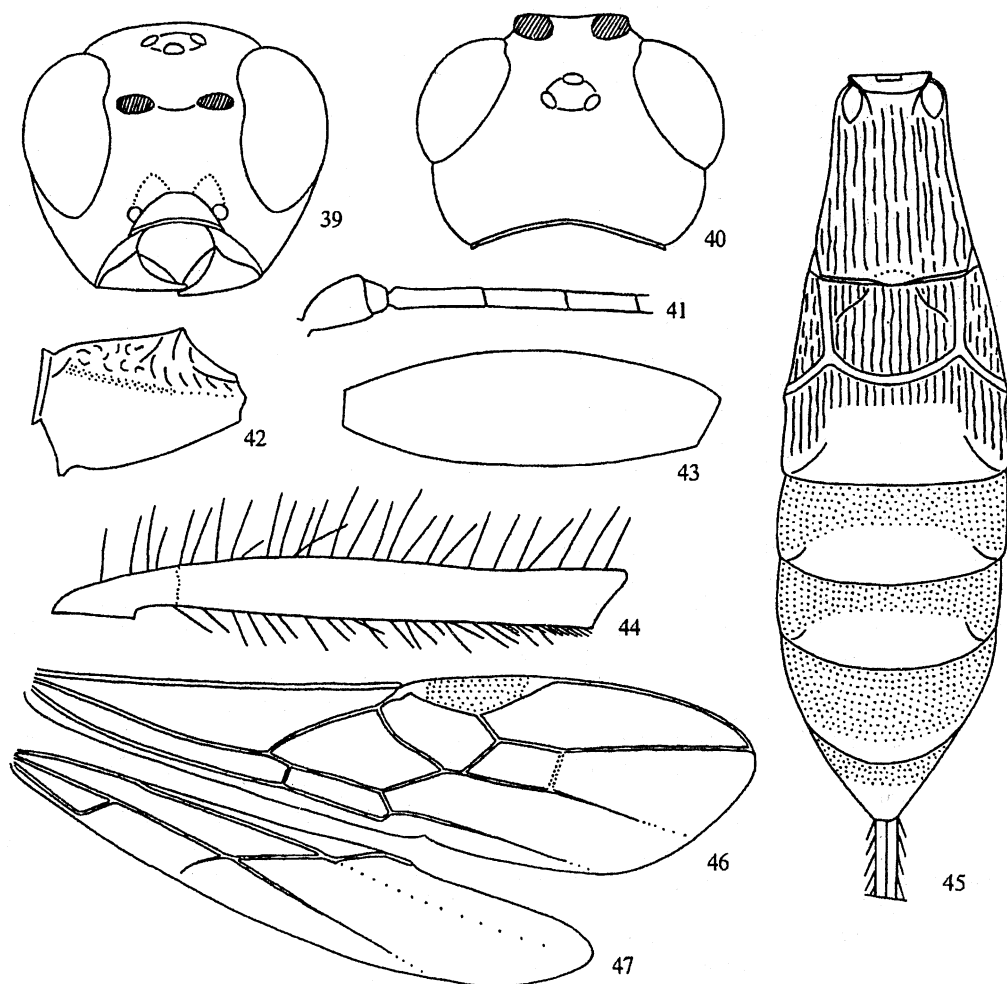
Antennae filiform, broken, but with at least 39 segments. Scapus 1.6-1.7 times as long as its maximum width. 1st flagellar segment 5 times as long as its apical width, slightly longer than 2nd segment.

Thorax. Length 2-2.3 times its height. Prothorax with weakly convex lobe dorsally and with distinct pronotal keel. Median lobe of mesoscutum convex. Notauli deep, sparsely crenulate. Prescutellar depression deep, with distinct median carina, sparsely striate, 0.33-0.35 times as long as scutellum. Subalar depression shallow, wide, transversely striate. Sternauli distinct, smooth, connected with prepectal carina anteriorly, running along approximately three-quarters of lower part of mesopleurae. Propodeum without lateral tubercles.

Wings. Fore wing 3.8-4.5 times as long as its maximum width. Radial vein arising from middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 1.7-2 times 1st abscissa, 0.33-0.4 times the straight 3rd abscissa, 1.4-1.6 times 1st radiomedial vein. 2nd radiomedial cell 2.2-2.8 times as long as its maximum width, 0.8-0.9 times as long as brachial cell. Recurrent vein 3.5-4.5 times 2nd abscissa of medial vein. Distance from nervulus to basal vein nearly equal to nervulus length. In hind wing, 1st abscissa of mediocubital vein 0.7-0.8 times as long as 2nd abscissa. Recurrent vein straight, weakly curved distally, slightly antefurcal.

Legs. Hind femur 3-3.5 times as long as wide. Hind coxa with distinct submedian dorsal tooth. Hind tarsus almost as long as hind tibia. Basitarsus 0.8-0.9 times as long as 2nd-5th segments combined. 2nd tarsal segment about 0.4 times as long as basitarsus, 1.4-1.5 times as long as 5th segment (without pretarsus).

Abdomen 1.25 times as long as head and thorax combined. 1st tergite with large dorsope, with small spiracular tubercles in basal



Figs 39-47. *Doryctes denticoxa* sp. n. 39, head, frontal view; 40, head, dorsal view; 41, 5 basal segments of antenna; 42, hind coxa; 43, hind femur; 44, hind tibia; 45, abdomen, dorsal view; 46, fore wing; 47, hind wing.

quarter, weakly and almost linearly widened from base to apex. Maximum width of 1st tergite 1.2-1.4 times its width at level of dorsope; length 1.4-1.6 times its apical width. 2nd tergite with distinct anterolateral depressions, length of tergite 0.5-0.6 times its basal width, slightly greater than length of 3rd tergite. 2nd suture shallow, with distinct lateral bends. Ovipositor sheath 0.6-0.7 times as long as body, 1.2-1.4 times as long as abdomen, 0.85-1 times as long as fore wing.

Sculpture and pubescence. Head smooth; frons and especially face mostly striate; clypeus punctulate-rugulose. Mesoscutum smooth, but rugose medioposteriorly. Propleurae ru-

gose. Mesopleurae smooth. Propodeum coarsely reticulate-rugose, smooth basally, without marginate areas, with dorsal carina in basal half or third. Hind coxae rugose-punctulate dorsally. 1st and 2nd abdominal tergites entirely and 3rd in basal third striate. 4th-6th tergites densely granulate with sparse striae. Head and thorax with dense, long and erect hairs. Hind tibia with long, sparse and erect hairs dorsally, length of these hairs 1.1-1.5 times maximum width of hind tibia.

Colour. Body (dark) reddish brown, head and anterior part of thorax lighter. Antennae dark reddish brown, two basal segments

reddish brown. Palpi light reddish brown or sometimes dark. Legs light or dark reddish brown, fore coxae and sometimes femora and middle coxae pale. Wings faintly infuscate. Pterostigma dark brown, yellowish basally and apically.

Male. Body length 5.2-6.4 mm; fore wing length 3.6-4.1 mm. Head width 1.2-1.3 times its median length. Length of thorax 2.3-2.6 times its height. Abdomen slender. Apical width of 1st tergite 1.1-1.2 times its width at level of dorsope; its length 1.7-2.3 times its apical width. Length of 2nd tergite nearly equal to its basal width. 4th-6th tergites usually almost entirely sculptured. Body almost entirely light reddish brown, rarely dark reddish brown (specimen from Japan). Legs entirely pale brown or yellow, rarely hind coxae and femora dark reddish brown. Otherwise similar to female.

Discussion. This new species is related to the Indonesian *D. merinotides* End. (holotype: ♀ (?), "Sumatra, Soekaranda, Dr. H. Dohrn S.", "Type" (red), "*Doryctes merinotides* Enderl., Type, Dr. Enderlein det., 1919"; IZW; examined) and differs in having the hind coxae with distinct dorsal tooth, pronotal lobe low, oblique propleural depression, subalar depression, hind coxae and most part of propodeum coarsely rugose, propodeum without marginate areas, hairs on dorsal part of hind tibia longer, pterostigma yellow basally and apically. Also *D. denticoxa* sp. n. is related to *D. longisetosus* Nixon (South Africa) because of hind coxae with dorsal tooth, and differs in having the temple convex in anterior half, ocellar triangle obtuse, vertex, mesoscutum and mesopleura smooth, 1st abdominal tergite and ovipositor longer, coloration of legs different.

Distribution. Taiwan, Japan.

***Doryctes henryi* sp. n.**

(Figs 48-57)

Holotype: ♀, Taiwan, Meifeng, 2150 m, 10.V.1983 (H. Townes) (AEI).

Paratypes. Taiwan: 3 ♀, Meifeng, 2150 m, 3, 10 & 15.V.1983 (H. Townes) (AEI, ZIP).

Description. Female. Body length 5.4-6.7 mm; fore wing length 4.9-5.8 mm. Head width 1.2-1.4 times its median length. Temple almost parallel-sided or weakly widened anteriorly, roundly narrowed behind eye posteriorly, slightly longer than transverse diameter of eye. Ocelli small, in triangle with base 1.3-1.4 times its sides. POL 1.5-1.6 times Od, 0.5-0.6 times OOL. Eye 1.3 times

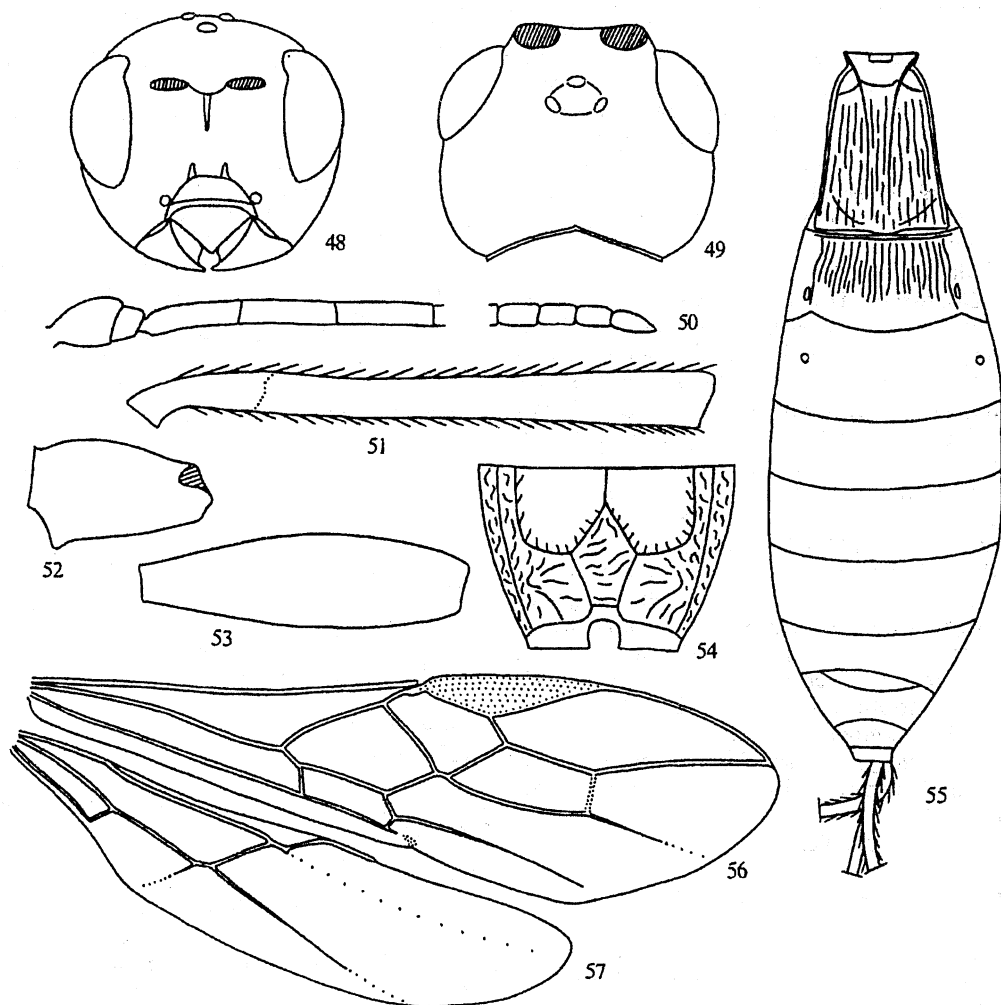
as high as broad. Cheek height 0.25-0.3 times height of eye, 0.5-0.6 times basal width of mandible. Face width equal to or slightly greater than height of eye and 1.2-1.3 times height of face and clypeus combined. Subocular suture very shallow, sometimes indistinct. Clypeus with narrow lower flange. Clypeal suture distinct. Hypoclypeal depression almost round, its width 1.1-1.3 times distance from edge of depression to eye. Occipital carina below not fused with hypostomal one. Palpi long, length of maxillary palpi 1.2 times head height.

Antennae filiform, 40-segmented. Scapus 1.3-1.5 times as long as its maximum width. 1st flagellar segment 3.6-3.8 times as long as its apical width, as long as or slightly shorter than 2nd segment. Penultimate segment 1.8-2 times as long as wide, 0.7 times as long as apical segment.

Thorax. Length 2-2.2 times its height. Prothorax with distinctly convex lobe dorsally (the latter with shallow median longitudinal depression) and fine pronotal keel. Median lobe of mesoscutum convex. Notauli deep, but shallow in distal third, crenulate. Prescutellar depression shallow, with 1-3 median carinae, finely sculptured, 0.25-0.3 times as long as scutellum. Subalar depression deep, wide, rugose. Sternauli distinct, almost smooth, connected with prepectal carina anteriorly, with deep and round depression at posterior margin, running along approximately half of lower part of mesopleurae. Propodeum with small lateral tubercles.

Wings. Fore wing 3.4-3.7 times as long as its maximum width. Radial vein arising before middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 3-3.4 times 1st abscissa, nearly half the straight 3rd abscissa, 1.5-1.7 times 1st radiomedial vein. 2nd radiomedial cell 2.2-2.7 times as long as its maximum width, 1.4-1.6 times as long as brachial cell. Recurrent vein 4.5-7 times 2nd abscissa of medial vein. Distance from nervulus to basal vein 0.8 times nervulus length. In hind wing, 1st abscissa of mediocubital vein 1.2-1.4 times as long as 2nd abscissa. Recurrent vein almost entirely straight, interstitial or antefurcal.

Legs. Hind femur 3.4-3.5 times as long as wide. Hind coxa without dorsal tooth. Hind tarsus slightly longer than hind tibia. Basitarsus 0.8-0.9 times as long as 2nd-5th segments combined. 2nd tarsal segment 0.45 times as long as basitarsus, almost twice as long as 5th segment (without pretarsus).



Figs 48-57. *Doryctes henryi* sp. n. 48, head, frontal view; 49, head, dorsal view; 50, basal and apical segments of antenna; 51, hind tibia; 52, hind coxa; 53, hind femur; 54, propodeum; 55, abdomen, dorsal view; 56, fore wing; 57, hind wing.

Abdomen slightly shorter than head and thorax combined. 1st tergite with distinct and round dorsope, with small spiracular tubercles in basal third, weakly and almost linearly widened from base to apex. Maximum width of 1st tergite almost twice its minimum width; length 1.1-1.3 times its apical width. 2nd tergite without anterolateral depressions, length of tergite 0.6-0.7 times its basal width, 1.1-1.2 times length of 3rd tergite. 2nd suture very fine. Ovipositor sheath 0.75-0.9 times as long as abdomen, half as long as fore wing.

Sculpture and pubescence. Head entirely finely punctulate. Mesoscutum densely punctulate, coarsely rugose medioposteriorly. Propleurae rugose. Mesopleurae smooth. Propodeum rugulose, almost smooth in basal half, with distinct marginate areas; median carina distinct in basal third or quarter; areola large and pentagonal. Hind coxae rugulose dorsally. 1st abdominal tergite rugose-striate, 2nd tergite striate in basal two-thirds. Other tergites smooth. Almost all body densely and shortly setose. Hind tibia with very short and almost recumbent yellowish hairs dorsally.

Colour. Body black, head in lower and posterior parts, prothorax and sometimes mesoscutum anteriorly light reddish brown. Abdomen (except 1st tergite) dark reddish brown. Antennae black, two basal segments reddish brown. Palpi yellowish brown. Legs dark reddish brown or black, middle and hind tibiae basally contrasted white. Wings faintly infusate. Pterostigma entirely brown.

Male unknown.

Discussion. This new species is closely related to the Palearctic *D. mutillator* (Thunberg) and differs in having the temple behind eyes convex and longer than transverse diameter of eye, basal part of middle and hind tibiae white and contrasting in colour with other parts of tibiae, vertex densely setose and hairs directed to lateral margin. Also this new species is related to *D. hedini* (Fahringer) from North China (Papp, 1988) and differs in having the temple behind eyes convex, cheek shorter, 2nd flagellar segment longer, radial vein arising distinctly before middle of pterostigma, ovipositor sheath shorter, basolateral areas of propodeum almost smooth, posterior third of 2nd tergite and 3rd tergite entirely smooth.

Etymology. This species is named after Dr. Henry Townes, well-known American hymenopterist.

Distribution. Taiwan.

Genus **Ontsira** Cameron, 1900

Ontsira comprises about 15 species. Nine species of this genus were recorded from the Palearctic Region and only two from the Oriental Region.

Key to the Taiwanese species of *Ontsira*

- 1(4). 2nd abdominal tergite entirely or mostly smooth. 3rd tergite without transverse furrow. Mesoscutum distinctly and rather densely granulate or punctulate. Sternauli crenulate. Head unicolorous.
- 2(3). Ovipositor sheath nearly as long as body. Mesoscutum densely punctulate, sparsely and very finely granulate. Recurrent vein of fore wing distinctly antefurcal. 1st abscissa of mediocubital vein of hind wing about 1.5 times 2nd abscissa. 2nd abdominal tergite always striate basally. Pterostigma entirely brown. Body length 4-7 mm **O. imperator** (Haliday)
- 3(2). Ovipositor sheath 0.8 times as long as abdomen. Mesoscutum very densely granulate, without punctulation. Recurrent vein of fore wing shortly antefurcal. 1st abscissa of mediocubital vein of hind wing as long as 2nd abscissa. 2nd

abdominal tergite entirely smooth. Pterostigma yellow in basal half, brown in apical half. Body length 3.6 mm **O. gratia** sp. n.

- 1(4). 2nd abdominal tergite almost entirely striate. 3rd tergite with fine transverse furrow. Mesoscutum smooth, with fine punctulation. Sternauli smooth. Head bicolorous.
- 5(6). 2nd abdominal tergite with distinct semi-oval smooth basal area, bounded by deep depression posteriorly. Radial vein arising behind middle of pterostigma. Body length 3.8-6.5 mm **O. palliatus** (Cameron)
- 6(5). 2nd abdominal tergite without basal area or rarely with very small medially. Radial vein arising from middle of pterostigma. Body length 3.7-4.2 mm **O. nixonii** (Watanabe)

Ontsira imperator (Haliday)

Shenefelt & Marsh, 1976: 1324; Belokobylskij, 1982: 610; Belokobylskij & Tobias, 1986: 43; Belokobylskij, 1994c: 18.

Material. Taiwan: 1 ♂, Meifen, 2150 m, 3.V.1983 (H. Townes).

Distribution. West Europe, Asia Minor, Caucasus, Russia, Japan, Taiwan (new record). North America.

Ontsira gratia sp. n.

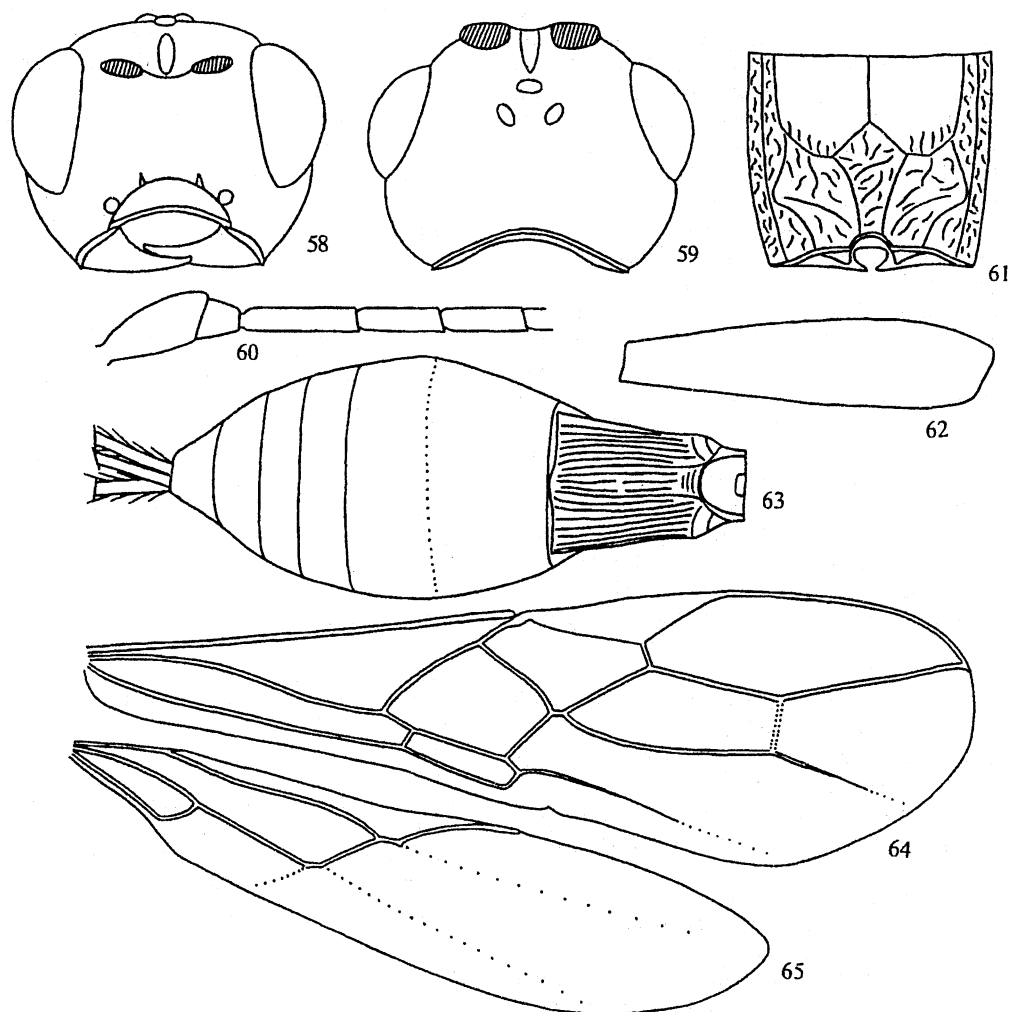
(Figs 58-65)

Holotype. ♀, Taiwan, Nantou Hsien, Meifeng, 22.V.1982 (R. Wharton) (TAMU).

Description. Body length 3.6 mm; fore wing length 3.5 mm. Head width 1.5 times its median length. Temple uniformly and roundly narrowed behind eye. Transverse diameter of eye 1.2 times length of temple. Ocelli in equilateral triangle; POL 1.3 times Od, almost 0.33 times OOL. Eye 1.1 times as high as broad. Cheek height 0.45 times eye height and slightly less than basal width of mandible. Subocular suture absent. Face width 1.25 times eye height and 1.4 times height of face and clypeus combined. Width of hypoclypeal depression nearly equal to distance from edge of depression to eye. Occipital carina below not fused with hypostomal one. Hypostomal flange distinct.

Antennae thickened, filiform, broken, but with at least 24 segments. 1st flagellar segment almost 4 times as long as its apical width, 1.3 times as long as 2nd segment.

Thorax. Length 1.8 times its height. Notauli distinct, shallow posteriorly, crenulate. Prescutellar depression deep, rugulose, with distinct median carina, 0.3 times as long as the convex scutellum. Metanotum with distinct and obtuse median tooth. Sternauli



Figs 58-65. *Ontsira gratia* sp. n. 58, head, frontal view; 59, head, dorsal view; 60, 5 basal segments of antenna; 61, propodeum; 62, hind femur; 63, abdomen, dorsal view; 64, fore wing; 65, hind wing.

deep, straight, finely crenulate, running along half of lower part of mesopleurae. Subalar depression shallow, rugulose and with sparse granulation.

Wing. Fore wing 3 times as long as wide. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 4.5 times 1st abscissa, 0.8 times 3rd abscissa, 1.3 times 1st radiomedial vein. 2nd radiomedial cell weakly narrowed distally, its length 2.7 times its maximum width, almost twice length of brachial cell. Recurrent vein slightly antefurcal. Distance from nervulus to basal vein 1.5 times length of nervulus. Parallel vein arising slightly be-

hind middle of vein on distal margin of brachial cell. In hind wing, 1st abscissa of mediocubital vein slightly longer than 2nd abscissa. 1st abscissa of costal vein half 2nd abscissa. Recurrent vein almost interstitial.

Legs. Hind femur claviform, 4.2 times as long as wide. Hind tarsus slightly shorter than hind tibia. Hind basitarsus 0.8 times as long as 2nd-5th segments combined. 2nd segment 0.4 times as long as basitarsus, almost equal to 5th segment (without pretarsus).

Abdomen 0.8 times as long as head and thorax combined. 1st tergite uniformly and

almost linearly widened from base to apex, with deep dorsope, without spiracular tubercles, spiracles placed in basal third. Apical width of 1st tergite twice its minimum width; length 1.3 times its apical width. 2nd suture very fine. Length of 2nd tergite 0.8 times its basal width, 1.4 times length of 3rd tergite. Ovipositor sheath 0.8 times as long as abdomen, 0.39 times as long as fore wing.

Sculpture and pubescence. Head smooth, in part finely punctulate. Face medially and frons laterally granulate-rugose. Mesonotum densely granulate. Mesopleurae smooth. Metapleurae coarsely rugose. Propodeum with distinct marginate areas and median carina in basal third, areola small and rectangular; basolateral areas finely granulate with rugae, rest of propodeum sparsely rugose. Hind coxae finely rugulose ventrally. 1st abdominal tergite entirely striate, dorsal carinae in basal half distinct. Other abdominal tergites smooth. Hind tibiae with dense short and semi-erect hairs, length of hairs 0.7-0.8 times maximum width of tibia.

Colour. Body reddish brown with dark spots. Scapus light reddish brown, other antennal segments dark reddish brown. Palpi yellow. Legs pale brown, hind femora almost entirely and hind tibiae distally dark. Wings infusate. Pterostigma brown, yellow in basal half.

Male unknown.

Discussion. This new species is related to *O. eugeniae* Belokobyl'skij (Belokobyl'skij, 1982) from Russian Far East (Primorsk Terr.) and differs in having the eyes larger, temples shorter, vertex and 2nd abdominal tergite smooth, 1st abdominal tergite longer, mesopleurae almost smooth, mesoscutum densely and shortly setose. This species is distinguished from *O. antica* (Wollaston), widely distributed in the Palaearctic, by the mesoscutum and basolateral areas of propodeum densely and distinctly granulate, radial vein arising behind middle of narrow pterostigma, and 1st abdominal tergite longer. *O. gratia* sp. n. is also distinguished from *O. reticulata* Cameron (holotype: ♀ "Ontsira reticulata Cam., type, Khasia", "790.", "Type Hym: 896. Ontsira reticulata Cameron, 1900. Hope Dept. Oxford", "♀ Ontsira reticulata Cameron, C. van Achterberg, 1979, Holotype"; OUM; examined) by the occipital carina lost below, radial vein arising distinctly behind middle of pterostigma, recurrent vein almost intersti-

tial, nervulus distinctly postfurcal, parallel vein arising almost from middle of distal part of brachial cell, 2nd abdominal tergite long, ovipositor sheath shorter, basolateral areas of propodeum granulate, and 1st abdominal tergite entirely striate.

Distribution. Taiwan.

Ontsira palliatus (Cameron)

Shenefelt & Marsh, 1976: 1326.

Material. Taiwan: 3 ♀, "Suisharyo, Formosa, X [19]11, H. Sauter II"; 1 ♀, "Kankau (Koshun), Formosa, H. Sauter, VII. 1912"; 1 ♀, "Taihorin, Formosa, H. Sauter, V. [19]10". China: 1 ♀, "China, 20.9. [19]12, Mell S.V.".

Distribution. China, Guam, Hawaii, India, Nepal (new record), Philippines (new record), Russia (Primorsk Terr.) (Belokobyl'skij, 1990b, as *O. nixonii* Watanabe), Seychelles, Taiwan, Vietnam.

Ontsira nixonii (Watanabe)

Watanabe, 1952: 25 (*Doryctes*); Shenefelt & Marsh, 1976: 1289 (*Doryctes*); Belokobyl'skij, 1987: 79.

Material. Taiwan: 1 ♀, "Formosa, Hoozan, X. 10, Sauter S. G.".

Distribution. Japan, Taiwan (new record).

Remark. *O. nixonii* Watanabe was recorded erroneously from the Russian Far East (Belokobyl'skij, 1990b); the respective specimen belongs really to *O. palliatus* (Cameron).

Genus Hypodoryctes Kokujev, 1900

This small genus, with only 3 species, is represented in the Palaearctic and Neotropical Regions (Belokobyl'skij, 1982, 1995; Papp, 1987; Marsh, 1993 (as *Mixtec*)). *Hypodoryctes* is recorded for the Oriental Region for the first time.

Key to the Taiwanese species of Hypodoryctes

- 1(2). 2nd abdominal tergite transverse, its length 0.6-0.8 times its basal width. Length of 1st abdominal tergite 1.5-1.9 times its apical width. – Transverse diameter of eye 1.3-1.5 (rarely 1.7-1.8) times length of temple. Median lobe of mesoscutum distinctly convex. 2nd radiomedial cell usually long, its length 2.7-3.1 (very rarely 2.4-2.6) times its width. 1st abdominal tergite weakly widened from base to apex. 2nd abdominal tergite with distinct V-like figure. Body length 3.7-8.8 mm **H. bilobus** (Shestakov)
- 2(1). 2nd abdominal tergite almost square, its length equal to or slightly greater than (rarely

slightly less than) its basal width. Length of 1st abdominal tergite 1.7-2.3 times its apical width.

- 3(4). Median lobe of mesoscutum weakly convex. 2nd radiomedial cell shorter, 2.3-2.8 (rarely 2.9-3) times as long as wide. 1st abscissa of mediocubital vein of hind wing nearly equal to 2nd abscissa. 1st abdominal tergite usually distinctly widened from base to apex. 2nd tergite usually without V-like pale figure; sometimes this figure present, but indistinct. Body length 2-7.7 mm . . .

..... **H. sibiricus** Kokujev
4(3). Median lobe of mesoscutum distinctly convex. 2nd radiomedial cell longer, 2.9-3.3 times as long as wide. 1st abscissa of mediocubital vein 1.2-1.5 times 2nd abscissa. 1st abdominal tergite weakly widened from base to apex. 2nd tergite with distinct V-like figure, bounded by furrows. Body length 7.5-10.9 mm . . . **H. torridus** Papp

Hypodoryctes sibiricus Kokujev

Shenefelt & Marsh, 1976: 1313; Belokobyl'skiy, 1982: 611; Papp, 1984: 178; Belokobyl'skiy & Tobias, 1986: 41; Belokobyl'skiy, 1994c: 14; 1995: 166 (synonymy of *M. whartoni*).

Mixtec whartoni Marsh, 1993: 26.

Material. Taiwan: 4 ♀, 3 ♂, Wushe, 1150 m, 2, 7, 13, 25.IV, 22.V.1983 (H. Townes); 6 ♀, 27 ♂, Meifeng, 2150 m, 26.IV, 3, 10, 15, 22, 29.V.1983 (H. Townes) (including 1 ♀ and 15 ♂ of forma *nitidus*); 1 ♀, Shan-Lin-Chi (Nantou Hsien), 1600 m, 16.V.1990, FIT & PT, primary forest (L. LeSage); 1 ♀, Nantou Hsien, Tsuifeng, 23.V.1982 (R. Wharton); 2 ♂, Nantou Hsien, Meifeng, 22.V.1982 (R. Wharton).

Distribution. Finland, Hungary, Yugoslavia, Georgia, Russia (European part, Urals, Siberia, Far East), Kazakhstan, Japan, Taiwan (new record), Burma (new record); Mexico.

Remark. Some of the Taiwanese specimens have 3rd-6th abdominal tergites entirely and 2nd tergite in distal half or (rarely) almost entirely smooth or almost smooth (forma *nitidus* f. n.). Sometimes mesoscutum and various areas of thorax are reddish brown.

Hypodoryctes bilobus (Shestakov)

Shenefelt & Marsh, 1976: 1278 (*Doryctes*); Belokobyl'skiy, 1982: 611; Belokobyl'skiy & Tobias, 1986: 41; Papp, 1987: 158; Belokobyl'skiy, 1994c: 14.

Material. Taiwan: 2 ♀, 1 ♂, Meifeng, 2150 m, 3, and 22.V.1983 (H. Townes); 1 ♀, Nantou Hsien, Tsuifeng, 23.V.1982 (R. Wharton); 1 ♂, Nantou Hsien, Meifeng, 22.V.1982 (R. Wharton); 1 ♀, "Hoozan, Formosa, H. Sauter, II.[19]10".

Distribution. Korea, Russia (East Siberia, Far East), Taiwan (new record).

Hypodoryctes torridus Papp

Papp, 1987: 161; Belokobyl'skiy, 1990b: 36; 1994c: 15.

Material. Taiwan: 1 ♂, "Formosa, Sauter S.V."

Distribution. Korea, Russia (south of the Far East), Taiwan (new record).

Tribe **HOLCOBRACONINI**

Genus **Zombrus** Marshall, 1897

Zombrus comprises about 45 species from the Old World (Shenefelt & Marsh, 1976). Seven species were recorded from the Oriental Region, including *Z. bicolor* Enderlein which is penetrating into the Palaearctic.

Zombrus bicolor (Enderlein)

Enderlein, 1912: 29 (*Neotrimorus*; lectotype: ♂, "Formosa, Takao, H. Sauter, 16.VI.[19]07", "*Neotrimorus bicolor* Endrl. ♂, Type, Dr. Enderlein det. 1912", "Type"; IZW; here designated); Shenefelt & Marsh, 1976: 1366; Fischer, 1980: 556; Belokobyl'skiy, 1994c: 22 (synonymy of *O. sjostedti*).

Odontobracon sjostedti Fahringer, 1929: 83; Shenefelt & Marsh, 1976: 1371.

Material. Taiwan: 1 ♂, lectotype; 1 ♂, "Taihorin-sho", IX.1909 (H. Sauter).

Distribution. China, Japan, Korea, Mongolia, Russia (south of the Far East), Taiwan.

Tribe **HECABOLINI**

Genus **Parallorhogas** Marsh, 1993

Parallorhogas comprises 6 species from various zoogeographical regions (Marsh, 1993). Two species were known from the Oriental Region. This genus is recorded from Taiwan for the first time.

Parallorhogas pallidiceps (Perkins)

Shenefelt & Marsh, 1976: 1266 (*Allorhogas*); Marsh, 1993: 28.

Material. Taiwan: 1 ♀, "Kosempo", 7.IX.1909 (H. Sauter).

Distribution. Fiji, Guam, Hawaii, India, New Zealand, Taiwan (new record), Vietnam; Uganda; USA (Florida).

Genus **Polystenus** Förster, 1862

Polystenus comprises 3 species from the Palaearctic and Oriental Regions. This genus is recorded from Taiwan for the first time.

Polystenus rugosus Förster

Shenefelt & Marsh, 1976: 1361; Papp, 1984: 182; Belokobylskij & Tobias, 1986: 34; Belokobylskij, 1994c: 26.

Material. Taiwan: 2 ♀, Meifeng, 2150 m, 3. and 15.V.1983 (H. Townes).

Distribution. Czechia, Germany, Hungary, Italy, Kazakhstan, Russia (European part, south of the Far East), Taiwan (new record), Tadzhikistan, Ukraine.

Tribe **HETEROSPILINI**Genus **Heterospilus** Haliday, 1836

Heterospilus is a large and polymorphic genus, comprising more than 85 species from all zoogeographic regions. Only 7 species were known from the Oriental region (Shenefelt & Marsh, 1976; Belokobylskij, 1994d). The genus is recorded from Taiwan for the first time.

Key to the Taiwanese species of *Heterospilus*

- 1(2). 2nd abdominal tergite with distinct elongate lens-shaped area in posterior third. 4th and often 5th abdominal tergites striate basally. Mesoscutum granulate, with dense transverse striation, entirely setose. Apical segments of antenna yellowish-white. Body length 2.7-3.1 mm **H. hemitestaceus** sp. n.
- 2(1). 2nd abdominal tergite without elongate area. 4th and 5th abdominal tergites entirely smooth. Mesoscutum often (almost) smooth or granulate, without striation, setose along notauli and laterally only. Antennae dark apically.
- 3(4). Ovipositor sheath 0.5-0.6 times as long as abdomen. Mesoscutum granulate or (f. *asiaticus* f. n.) (almost) smooth. Length of 1st abdominal tergite nearly equal to or less than its apical width. Body length 2.7-3.0 mm **H. austriacus** (Szépligeti)
- 4(3). Ovipositor sheath nearly as long as abdomen. Mesoscutum always smooth. Length of 1st abdominal tergite 1.2-1.3 times its apical width. Body length 2.8-3.0 mm ... **H. separatus** Fischer

Heterospilus separatus Fischer

Shenefelt & Marsh, 1976: 1311; Belokobylskij & Tobias, 1986: 32; Belokobylskij, 1994c: 31.

Material. Taiwan: 1 ♀, Meifeng, 2150 m, 10.V.1983 (H. Townes); 1 ♀, Wushe, 1150 m, 10.V.1983 (H. Townes).

Distribution. Azerbaijan, Austria, Hungary, Kazakhstan, Moldova, Mongolia,

Russia (European part, Urals, East Siberia, Far East), Taiwan (new record), Ukraine.

Heterospilus austriacus (Szépligeti)

Shenefelt, 1975: 1193 (*Coeloreuteus*); Belokobylskij & Tobias, 1986: 34; Belokobylskij, 1994c: 29.

Material. Taiwan: 9 ♀, 1 ♂, Wushe, 1150 m, 2, 13, 19, 26.IV, 3, 10, 15.V.1983 (H. Townes); 2 ♂, Meifeng, 2150 m, 22 and 29.V.1983 (H. Townes).

Distribution. Armenia, Austria, Kazakhstan, Moldova, Russia (European part, Urals, Buryatia, south of the Far East), Taiwan (new record), Ukraine.

Remark. Most specimens of this species from Taiwan have the mesoscutum almost smooth or very finely granulate (forma *asiaticus* f. n.). I have several specimens of *H. austriacus* f. *asiaticus* f. n. from Primorsk Territory (Russian Far East).

Heterospilus hemitestaceus sp. n.

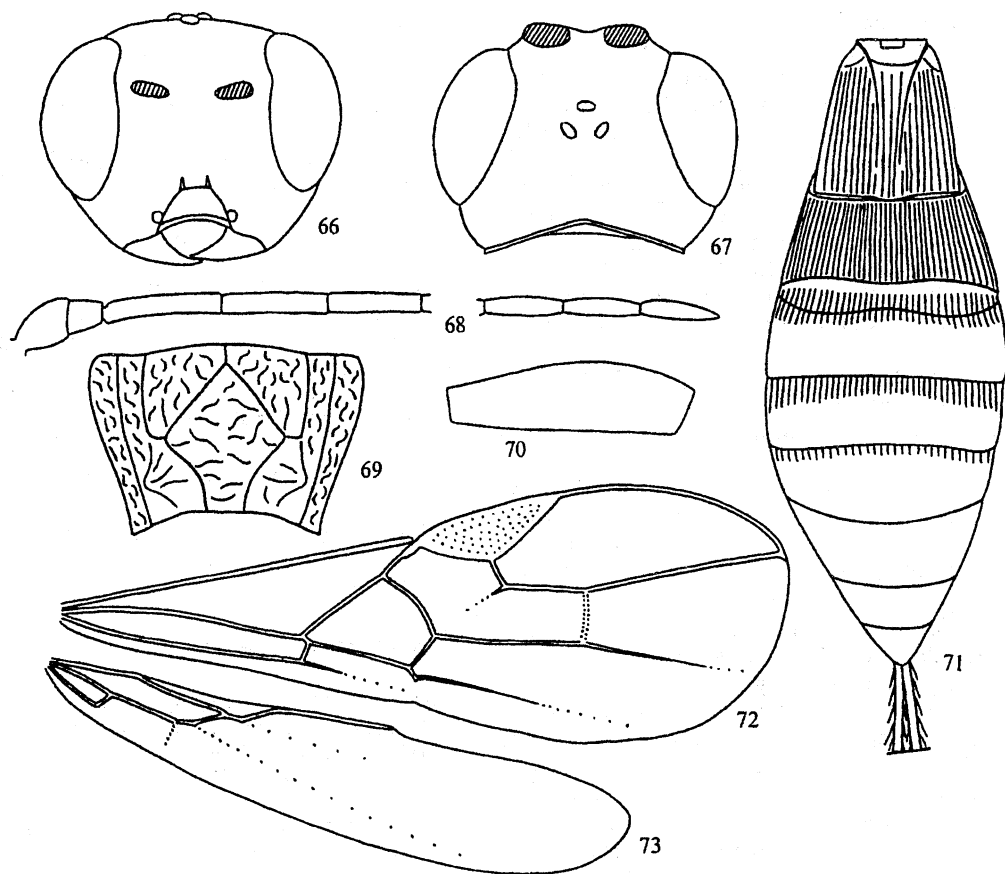
(Figs 66-73)

Holotype. ♀, Vietnam, prov. Vinh Phu, Tam Dao, 1000 m, forest, 16.XI.1990 (S. Belokobylskij) (ZIP).

Paratypes. Vietnam: 2 ♀, same locality, 12. and 16.XI.1990 (S. Belokobylskij) (ZIP); Taiwan: 1 ♀, Wushe, 1150 m, 29.V.1983 (H. Townes) (AEI).

Description. Female. Body length 2.7-3.1 mm; fore wing length 2.2-2.7 mm. Head width 1.4 times its median length. Temple distinctly and roundly narrowed behind eye. Transverse diameter of eye 2.7-3.3 times length of temple. Ocelli small and in almost equilateral triangle, POL 0.8-1 times Od, 0.4 times OOL. Eye without hairs, 1.1-1.2 times as high as broad. Cheek height 0.3-0.35 times eye height, 0.8 times basal width of mandible. Face width almost equal to eye height and 1.1-1.2 times height of face and clypeus combined. Hypoclypeal depression small and round, its width 0.7-0.8 times distance from edge of depression to eye. Subocular suture absent. Head distinctly and almost linearly narrowed below eyes. Occipital carina fused with hypostomal one near mandible.

Antennae slender, filiform, 21-24-segmented. Scapus 1.4-1.6 times as long as its maximum width, 1.6-2 times as long as pedicel. 1st flagellar segment 4.5-5 times as long as its apical width, nearly as long as 2nd segment. Penultimate segment 3.5-4 times as long as wide, 0.7 times as long as 1st segment, 0.8-1 times as long as apical segment, the latter without spine.



Figs 66-73. *Heterospilus hemitestaceus* sp. n. 66, head, frontal view; 67, head, dorsal view; 68, basal and apical segments of antenna; 69, propodeum; 70, hind femur; 71, abdomen, dorsal view; 72, fore wing; 73, hind wing.

Thorax. Length about twice its maximum height. Mesoscutum highly and roundly raised above prothorax. Pronotal carina distinct. Notauli complete, deep anteriorly and shallow posteriorly, crenulate. Median longitudinal depression of mesoscutum (between notauli) indistinct. Anterolateral corners of median lobe of mesoscutum present, but obtuse and short. Prescutellar depression deep, sculptured, with median carina, nearly half as long as the convex scutellum. Sternauli deep, straight, almost smooth, running along almost half of lower part of mesopleura. Subalar depression shallow and rugose-striate.

Wing. Length of fore wing 2.8-3.2 times its maximum width. Metacarpus 1.3-1.4 times as long as pterostigma. Radial vein arising slightly before middle of pterostigma. 2nd radial abscissa 2-3 times 1st abscissa, 0.35-

0.4 times the straight 3rd abscissa. Distance from nervulus to basal vein 0.3-0.5 times length of nervulus. Parallel vein curved basally. In hind wing, 1st abscissa of mediocubital vein 0.7-0.8 times as long as 2nd abscissa. 1st abscissa of costal vein slightly longer or shorter than 2nd abscissa. Recurrent vein present, straight or curved to apical margin of wing, antefurcal.

Legs. Hind coxa with distinct basoventral tooth. Hind femur 3.2-3.6 times as long as wide. Hind tarsus 0.8-0.9 times as long as hind tibia. Hind basitarsus 0.4 times as long as 2nd-5th segments combined. 2nd tarsal segment 0.8 times as long as basitarsus, 1.3 times as long as 5th segment (without pretarsus).

Abdomen nearly as long as head and thorax combined. 1st tergite rather long, without spiracular tubercles, distinctly and line-

early widened from base to apex, dorsal carinae distinct and long. Apical width of 1st tergite 1.8-2 times its minimum width, 0.9-1.1 times its length. 2nd tergite with distinct almost straight transverse depression; 2nd suture distinct, curved laterally and weakly curved medially. Length of 2nd tergite 0.6-0.8 times its basal width, 1.6-1.9 times length of 3rd tergite. Length of 2nd and 3rd tergites combined 0.7-0.9 times their maximum width. Ovipositor straight, its sheath (including its part under apex of abdomen) 0.5-0.6 times as long as abdomen, 0.3-0.4 times as long as fore wing.

Sculpture and pubescence. Frons and sometimes vertex anteriorly finely striate, often with large smooth areas, rarely entirely smooth; face sparsely punctulate, in part with rugulae, rest of head smooth. Mesoscutum densely granulate with fine or distinct transverse striae; scutellum almost smooth. Mesopleurae smooth. Propodeum with two marginate basolateral areas and large pentagonal areola; entire propodeum reticulate-rugulose, but basolateral areas often rather finely punctulate-rugulose. Legs smooth. 1st and 2nd abdominal tergites entirely (usually except transverse posterior area in part), and 3rd-5th tergites basally (in Taiwanese specimen in basal thirds) striate. Rest part of abdomen smooth. Mesoscutum entirely and densely setose. Hind tibia with rather long hairs dorsally, length of these hairs 0.8-1.2 times maximum width of hind tibia.

Colour. Head, thorax and apical third of abdomen light reddish brown, basal two-thirds of abdomen and usually propodeum dark reddish brown. Antennae brown, sometimes light brown, yellow basally, with 6 apical segments white. Palpi pale yellow. Legs yellow. Wings faintly infusate. Pterostigma brown, pale basally and apically.

Male unknown.

Discussion. This new species is related to *H. alboapicalis* Belokobylskij (Belokobylskij, 1994d) from Vietnam and differs in having the 1st abdominal tergite and ovipositor sheath shorter, vertex almost smooth, propodeal basolateral areas entirely sculptured, and mesoscutum entirely setose.

Tribe ECPHYLINI

Genus *Ecphylus* Förster, 1862

Ecphylus comprises nearly 30 species in the World fauna (Shenefelt & Marsh, 1976).

Only 2 species were known from the Oriental Region (Belokobylskij, 1993). *Ecphylus* is recorded from Taiwan for the first time.

Ecphylus (*Sactopus*) *caudatus* Ruschka

Shenefelt & Marsh, 1976: 1346; Belokobylskij & Tobias, 1986: 31; Belokobylskij, 1994c: 33.

Material. Taiwan: 1 ♀, Wushe, 1150 m, 2.IV.1983 (H. Townes).

Distribution. Algeria, Austria, France, Israel, Japan, Morocco, Rumania, Russia (European part, Primorsk Terr.), Taiwan (new record), Yugoslavia.

Tribe STEPHANISCINI

Genus *Leptospathius* Szépligeti, 1902

Leptospathius is a small genus comprising 5 species from the Oriental and Australian Regions (Shenefelt & Marsh, 1976).

Leptospathius triangulifera Enderlein

Enderlein, 1914: 33 (lectotype: ♀, "Formosa, Hoozan, V.[19]10, Sauter", "Syntypus", "*Leptospathius triangulifera* Enderl. ♀, Type"; DEI; here designated); Shenefelt & Marsh, 1976: 1376.

Material. Taiwan: 1 ♀, lectotype; 1 ♂, "Taihorin, Formosa, H. Sauter, 1911", "7.XI", "Syntypus", "*Leptospathius triangulifera* Enderl. ♂, Type, Dr. Enderlein det. 1913" (paralectotype; DEI); 1 ♂, "Kosempo, Formosa, H. Sauter, VI. 1912", "Type", "*Leptospathius triangulifera* Enderl. ♂, Type, Dr. Enderlein det. 1913" (paralectotype; IZW).

Description. Female. Body length 15.3 mm; fore wing length 11 mm. Head width 1.4 times its median length. Temple roundly narrowed behind eye. Transverse diameter of eye 1.3 times length of temple. Ocelli in triangle with base 1.2 times its sides, POL 1.3 times Od, slightly shorter than OOL. Eye 1.3 times as high as broad. Cheek height 0.25 times eye height, almost half basal width of mandible. Face width 0.8 times eye height and 1.3 times height of face and clypeus combined. Face above with small and distinct tooth between antennal sockets. Subocular suture absent. Hypoclypeal depression round, its width 1.2 times distance from edge of depression to eye. Clypeus with distinct flange at lower margin. Clypeal suture distinct. Maxillary palpi long.

Antennae slender, setiform, broken, but with at least 15 segments. Scapus 1.4-1.5 times as long as its maximum width. 1st flag-

ellar segment slightly curved, 4.2 times as long as its apical width, 0.9 times as long as 2nd segment.

Thorax. Length 2.4 times its maximum height. Pronotum with wide and convex dorsal lobe. Mesoscutum weakly and roundly raised above prothorax. Notauli distinct, complete, crenulate. Median lobe of mesoscutum long, with distinct and crenulate median longitudinal furrow. Prescutellar depression deep, rather narrow, with sparse striae, 0.3 times as long as the almost flat scutellum. Mesoscutum with distinct lobes latero-posteriorly. Postscutellum with pointed median tubercle. Sternauli deep, narrow, long, crenulate, running along 0.6-0.7 times lower part of mesopleura. Subalar depression deep, rather narrow, crenulate. Mesopleural pit deep and elongate.

Wing. Radial vein arising before middle of pterostigma. Radial cell not shortened. Metacarpus (within radial cell) 1.2-1.3 times as long as pterostigma. 2nd radial abscissa 3 times 1st abscissa, 0.7 times weakly curved 3rd abscissa, almost twice 1st radiomedial vein. 2nd radiomedial cell weakly narrowed distally, its length 3.5 times its maximum width, slightly less than length of brachial cell. Recurrent vein slightly antefurcal. Distance from nervulus to basal vein 0.4 times length of nervulus. In hind wing, 1st abscissa of mediocubital vein 1.4 times 2nd abscissa. Recurrent vein slightly postfurcal and weakly curved towards wing apex.

Legs. Hind coxa 2.5 times as long as wide, 0.7 times as long as hind femur. Hind femur rather slender, 4.5-4.6 times as long as wide. Middle tibia without spines. Inner spur of hind tibia very short, curved, setose, 0.15 times length of hind basitarsus. Hind tarsus almost as long as hind tibia; 3rd and 4th segments at their distal margins with long and thick spines ventrally. Hind basitarsus as long as 2nd-5th segments combined. 2nd segment half as long as basitarsus, 3 times as long as 5th segment (without pretarsus).

Abdomen. 1st tergite long, widened from base to apex, with distinct spiracular tubercles in basal third, dorsope almost lost, acrosternite long, ending before spiracles, about 0.3 times as long as tergite. Apical width of 1st tergite 2.25 times its basal width; its length 3 times its apical width, twice length of propodeum. 2nd tergite in basal two-thirds with triangular area open apically; length of 2nd tergite 1.3 times its basal width, 1.2 times length of 3rd tergite.

2nd suture distinct and straight. All tergites behind 1st densely and shortly setose. Hypopygium short and with short pointed process medioapically. Ovipositor sheath slightly longer than body, 1.4 times fore wing.

Sculpture. Head smooth, temple with sparse and curved striae in ventro-posterior half; face densely rugulose. Mesonotum densely and finely punctulate. Mesopleurae almost smooth. Metapleurae coarsely reticulate, finely punctulate anteriorly. Propodeum reticulate-rugose, almost smooth basolaterally. Hind legs densely and finely punctulate. 1st and 2nd abdominal tergites entirely rugulose, 3rd tergite aciculate basolaterally.

Colour. Body black. Head reddish brown, darker dorsally and posteriorly. Antennae dark reddish brown or black, two basal segments light reddish brown. Palpi dark brown, two apical segments of maxillary palpi pale brown. Tegulae black. Fore leg reddish brown, middle and hind legs dark reddish brown, middle and hind tibiae basally and hind basitarsus whitish yellow, other segments of hind tarsus reddish brown. All coxae almost black. Ovipositor sheath black, brown basally. Wings infusate. Pterostigma dark brown.

Male. Body length 12-13.7 mm; fore wing length 7.8 mm. Head width 1.2 times its median length. Transverse diameter of eye 1.1-1.2 times length of temple. Antenna 68-segmented. 1st flagellar segment 3.7-4 times as long as its apical width. Penultimate segment 4 times as long as wide. Apical segment with spine. Length of thorax 2.5-2.6 times its maximum height. 2nd radial abscissa 3.2-3.6 times 1st abscissa. 2nd radiomedial cell 3-3.7 times as long as wide. In hind wing, 1st abscissa of mediocubital vein almost equal to 2nd abscissa. Inner spur of hind tibia very slender and without hairs. 1st abdominal tergite very weakly widened from base to apex; acrosternite ending at level of spiracles, 0.33-0.36 times length of tergite. Apical width of 1st tergite 1.5-1.8 times its minimum width; its length 6-7 times its apical width. 1st tergite 2.5 times length of propodeum. 2nd tergite in basal third with triangular area almost closed apically. Length of 2nd tergite 3-3.2 times its basal width. Fore legs (including coxae) and middle legs (excluding coxae) yellowish brown.

Discussion. This species is closely related to the Australian *L. formosus* Szépligeti and differs by having the 1st abdominal tergite

shorter and rugose with sinuate striation, triangular area of 2nd tergite larger, 2nd radiomedial cell longer, propodeum densely and coarsely reticulate-rugose, hind tibia white basally only.

Tribe SPATHIINI

Genus *Spathiomorpha* Tobias, 1976

This small genus was known from the Palearctic Region only: *S. varinervis* Tobias (Tobias, 1976) from south of the European part of Russia and Ukraine, and *S. longipalpis* Belokobyl'skij (*S. furnata* Papp) (Belokobyl'skij, 1985; Papp, 1987, 1992) from south of the Russian Far East and Korea. *Spathiomorpha* is recorded from the Oriental Region for the first time.

Spathiomorpha enderleini sp. n.

(Figs 74-82)

Holotype. ♀, Taiwan, Meifeng, 2150 m, 3.IV.1983 (H. Townes) (AEI).

Description. Body length 3.9 mm; fore wing length 3.5 mm. Head width 1.6 times its median length. Temple strongly and roundly narrowed behind eye. Transverse diameter of eye 1.4 times length of temple. Ocelli small; POL almost equal to Od, 0.45 times OOL. Eye 1.1 times as high as broad. Cheek height 0.33 times eye height and 0.8 times basal width of mandible. Face width slightly greater than eye height and 1.3 times height of face and clypeus combined. Width of hypoclypeal depression 1.4 times distance from edge of depression to eye. Length of maxillary palpi subequal to head width. Length of 3rd segment of maxillary palpi 4.5 times its width. Occipital carina fused with hypostomal one near mandible. Hypostomal flange long and distinct.

Antennae almost setiform, 32-segmented, 1.2 times as long as body. 1st flagellar segment 4.5 times as long as its apical width, slightly longer than 2nd segment. Penultimate segment 3 times as long as wide, 0.8 times as long as apical segment.

Thorax. Length 1.6 times its height. Notauli deep, complete, crenulate. Prescutellar depression deep, smooth, with distinct median carina, almost half as long as the convex scutellum. Sternauli deep, oblique, crenulate, running along approximately half of lower part of mesopleurae. Subalar depression shallow, sparsely rugulose. Postscutellum with distinct tooth. Propodeum with

pointed lateral protuberances in posterior third.

Wing. Radial vein arising from middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 2.5 times 1st abscissa, 0.45 times 3rd abscissa, 1.2 times 1st radiomedial vein. 2nd radiomedial cell weakly narrowed distally, its length 2.5 times its maximum width. Distance from nervulus to basal vein 0.7 times nervulus length. In hind wing, 1st abscissa of mediocubital vein almost as long as 2nd abscissa.

Legs. Hind femur 4 times as long as wide. Hind tarsus as long as hind tibia. Hind basitarsus 0.7 times as long as 2nd-5th segments combined. 2nd tarsal segment 0.4 times as long as basitarsus, 1.2 times as long as 5th segment (without pretarsus).

Abdomen slightly longer than head and thorax combined. 1st tergite (petiole) weakly widened in basal two-thirds and strongly widened in distal third, with distinct spiracular tubercles in basal third. Apical width of petiole 1.6 times its width at level of spiracles, 2.2 times its minimum width; petiole 1.4 times as long as its apical width, slightly longer than propodeum, 0.4 times as long as remainder of abdomen. Length of 2nd and 3rd tergites combined 1.25 times basal width of 2nd tergite. 2nd suture indistinct. Ovipositor sheath about 0.7 times as long as abdomen, 2.2 times as long as petiole, 0.4 times as long as fore wing.

Sculpture. Head and mesothorax smooth. Propodeum smooth, but in part finely granulate with sparse rugae, with distinct marginate areas, median carina in basal two fifths, areola narrow and long. Petiole striate, rugulose medially. Other abdominal tergites smooth.

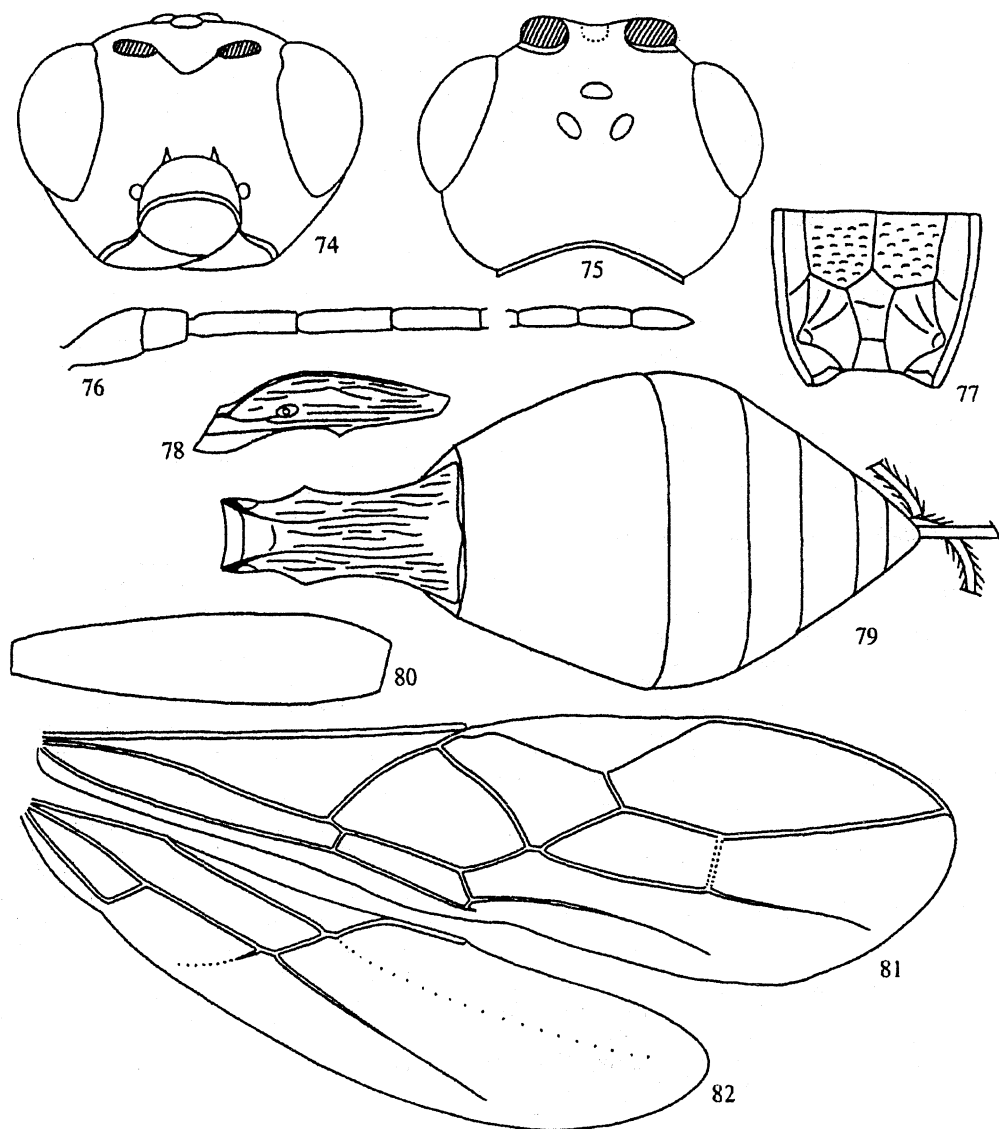
Colour. Body reddish brown. Mesoscutum and abdomen in part distinctly lighter. Antennae light reddish brown, dark apically. Palpi pale yellow. Tegulae and legs pale brown, tarsi darker. Wings faintly infusate. Pterostigma dark brown.

Male unknown.

Etymology. This species is named after Dr. G. Enderlein, famous German entomologist, who studied intensively the tropical and subtropical Braconidae.

Discussion. *S. enderleini* sp. n. is closely related to *S. longipalpis* Belokobyl'skij. These species can be separated by the following features:

- 1(2). Ovipositor sheath almost 0.33 times as long as body, 0.7 times as long as abdomen, 0.4 times



Figs 74-82. *Spathiomorpha enderleini* sp. n. 74, head, frontal view; 75, head, dorsal view; 76, basal and apical segments of antenna; 77, propodeum; 78, petiole, lateral view; 79, abdomen, dorsal view; 80, hind femur; 81, fore wing; 82, hind wing.

as long as fore wing. Antennae slender; penultimate segment 2.8 times as long as wide. Metapleurae almost smooth, finely punctulate, rugose only posteriorly. Legs pale brown almost entirely. Body length 3.9 mm. Taiwan

- *S. enderleini* sp. n.
2(1). Ovipositor sheath 0.7-0.9 times as long as body, 1.4-1.7 times as long as abdomen, 0.8-1 times as long as fore wing. Antennae thick; penultimate segment 2-2.2 times as long as wide. Metapleurae punctulate-rugose almost entirely, but often rugae fine anteriorly. Legs reddish

brown, sometimes darker. Body length 3.7-5.5 mm. Russia (south of Far East), Korea

..... *S. longipalpis* Belokobyl'skij

Genus *Spathiostenus* Belokobyl'skij, 1992

Monotypical genus *Spathiostenus* recorded from Taiwan Is. only (Belokobyl'skij, 1992).

Spathiostenus formosanus (Watanabe)

Watanabe, 1934: 191 (*Eucorystes*; holotype: ♀, "Kankau (Koshun), Formosa, H. Sauter, IV. 1912", "*Eucorystes formosanus* Watanabe ♀, Type"; DEI; examined); Shenefelt & Marsh, 1976: 1354 (*Eucorystoides*); Belokobyl'skij, 1992: 924.

Material. Taiwan: 1 ♀, holotype; 1 ♀ (without head and wings), "Kankau (Koshun), Formosa, H. Sauter, V. 1912", "*Eucorystes formosanus* Watanabe ♀, det. C. Watanabe".

Distribution. Taiwan.

Genus *Platyspathius* Viereck, 1911

Platyspathius is a small genus comprising 11 species from the Afrotropical and Oriental Regions (Shenefelt & Marsh, 1976; Chao, 1978).

Key to the Taiwanese species of *Platyspathius*

- 1(2). Temple longer, transverse diameter of eye 1.5 times as long as temple. Notauli complete. 2nd abdominal suture without crenulation or with it very fine. Body length 3.5-4.5 mm *P. dinoderi* (Gahan)
- 2(1). Temple shorter, transverse diameter of eye twice as long as temple. Notauli distinct anteriorly, absent posteriorly. 2nd abdominal suture distinctly and densely crenulate. Body length 3-4.2 mm *P. bisignatus* (Walker)

***Platyspathius dinoderi* (Gahan)**

Nixon, 1943: 427; Shenefelt & Marsh, 1976: 1385; Chao, 1978: 182.

Material. Taiwan: 1 ♀, 2 ♂, "Kankau (Koshun), Formosa, H. Sauter, VI. 1912", "*Spathius annuliventris* (Enderlein), det. C. Watanabe" (DEI).

Distribution. Andamans, China, Fiji, India, Philippines, Taiwan (new record).

***Platyspathius bisignatus* (Walker)**

Nixon, 1943: 425; Shenefelt & Marsh, 1976: 1384; Chao, 1978: 182.

Material. Taiwan: 1 ♀, "Kankau (Formosa), H. Sauter, VII. 1912", "*Spathius bisignatus* Walker ♀, det. C. Watanabe", "*Platyspathius bisignatus* Walk., G. Nixon det. 1950" (DEI).

Distribution. India, Indonesia, Malaysia, Philippines, Sri Lanka, Taiwan.

Genus *Spathius* Nees, 1818

Spathius is the largest doryctine genus comprising about 250 species from all zoo-

geographical regions, except the Neotropical (Shenefelt & Marsh, 1976). Nearly 200 species of this genus were recorded from the Oriental Region.

Key to the Taiwanese species of *Spathius*

- 1(6). Face with very dense, fine, absolutely even, transverse aciculation (like the surface of a gramophone record). Clypeal suture lost dorsally or (often) entirely. – Mediocubital vein curved to anal vein in distal half.
- 2(3). Hind coxa with basoventral tooth. Fine pronotal keel fused medially with posterior margin of pronotum. Parallel vein arising from anterior third of distal margin of brachial cell. Length of petiole twice its apical width. Propodeum with distinctly marginate areas. 4th and 5th abdominal tergites finely sculptured basally. Body length 2.7 mm *S. paraeritolaus* sp. n.
- 3(2). Hind coxa without basoventral tooth. Pronotal keel lost, if present then separated from posterior margin of pronotum. Parallel vein interstitial. Length of petiole 2.5-3 times its apical width. Propodeum without areas. 4th and 5th abdominal tergites smooth.
- 4(5). Antenna 32-segmented. 1st flagellar segment of antenna 4.5 times as long as its apical width. Length of thorax twice its height. Notauli complete. 2nd abscissa of radial vein 0.7 times 3rd abscissa. Nervulus interstitial. Hind femur 2.5 times as long as wide. Petiole 1.2 times as long as propodeum. Ovipositor sheath slightly longer than petiole. Mesopleurae smooth. Body length 3.9 mm *S. annuliventris* Enderlein
- 5(4). Antenna 23-segmented. 1st flagellar segment of antenna 5-6 times as long as its apical width. Length of thorax 1.7 times its height. Notauli lost in posterior half. 2nd abscissa of radial vein 0.9-1 times 3rd abscissa. Distance from nervulus to basal vein 0.3-0.7 times nervulus length. Hind femur 3 times as long as wide. Petiole 1.7 times as long as propodeum. Ovipositor sheath 1.4-1.5 times as long as petiole. Mesopleurae entirely densely and finely granulate. Body length 2.5-2.7 mm *S. mimeticus* Enderlein
- 6(1). Face with sculpture not as above. Clypeal suture complete.
- 7(16). 2nd abdominal tergites entirely smooth, rarely in male shortly striate basally.
- 8(11). Hypoclypeal depression large and transverse, its width about twice distance from depression to eye. 1st and 2nd abscissae of radial vein forming straight line.
- 9(10). Mesoscutum and frons smooth. Vertex entirely smooth. Sternauli crenulate. Body length 3.5-4.5 mm *S. eunyce* Nixon
- 10(9). Mesoscutum distinctly granulate, frons striate. Vertex more or less striate, sometimes striation very fine or absent. Sternauli almost smooth. Body length 2.8-3.5 mm *S. medon* Nixon

- 11(8). Hypoclypeal depression rather small and round, its width distinctly less than twice distance from depression to eye. 1st and 2nd abscissae of radial vein not forming straight line.
- 12(13). Antennae slightly thickened apically, 18-segmented. Mediocubital vein strongly curved to anal vein in distal half. Middle tarsi very short, their 1st segment about twice as long as wide. Ovipositor sheath 0.8 times as long as body. Vertex smooth. Body length 2.5 mm *S. wusheensis* sp. n.
- 13(12). Antennae filiform, not thickened apically, 23-29-segmented. Mediocubital vein not curved to anal vein. Middle tarsi rather long, their 1st segment about 3-4 times as long as wide. Ovipositor sheath not longer than abdomen. Vertex striate at least medially.
- 14(15). Temple distinctly roundly convex behind eye; transverse diameter of eye equal to length of temple. Vertex finely and linearly striate medially only. Pronotal keel very fine. Hind coxa without basoventral tooth. Body length 3.5 mm *S. convexitemporalis* sp. n.
- 15(14). Temple strongly roundly narrowed behind eye; transverse diameter of eye 1.7-1.8 times length of temple. Vertex coarsely and entirely striate, striae strongly curved toward occipital carina (especially medially). Pronotal keel distinct. Hind coxa with basoventral tooth. Body length 3.2-3.3 mm *S. yunnanensis* Chao
- 16(7). At least 2nd abdominal tergite sculptured.
- 17(18). 4th abdominal tergite distinctly larger than 5th, strongly and entirely rugose-striate. 3rd and 4th tergites with separated laterotergites. Length of 2nd and 3rd tergites combined 1.8 times apical width of 3rd tergite. - Vertex smooth. Mesopleurae coarsely rugose. Body length 8.5 mm *S. miletus* Nixon
- 18(17). 4th abdominal tergite shorter than 5th, rarely almost equal to it, tergite smooth or rather finely sculptured in basal half. 3rd and 4th without separated laterotergites. Length of 2nd and 3rd tergites 1.4-1.5 times less than apical width of 3rd tergite.
- 19(20). Pronotal keel fine and usually fused medially with posterior margin of pronotum. 4th and 5th abdominal tergites smooth, rarely very finely rugulose basally. Dorsal surface of hind tibia with short and semi-erect hairs. Hind coxa with basoventral tooth. Body length 2-3.5 mm *S. brevicaudis* Ratzeburg
- 20(19). Pronotal keel strong and not fused with posterior margin of pronotum. 4th and 5th abdominal tergites finely and transversely aciculate. Dorsal surface of hind tibia with long and erect hairs. Hind coxa without basoventral tooth. - Metapleurae densely and finely reticulate.
- 21(22). Vertex and temple sharply and entirely striate. Palpi darkened. Hind tibia entirely reddish brown. Body length 4.5-7 mm *S. apicalis* Westwood
- 22(21). Vertex and temple smooth. Palpi pale yellow. Hind tibia reddish brown, pale yellow in basal third. Body length 3.5 mm *S. taiwanicus* sp. n.

***Spathius paracritolaus* sp. n.**
(Figs 83-94)

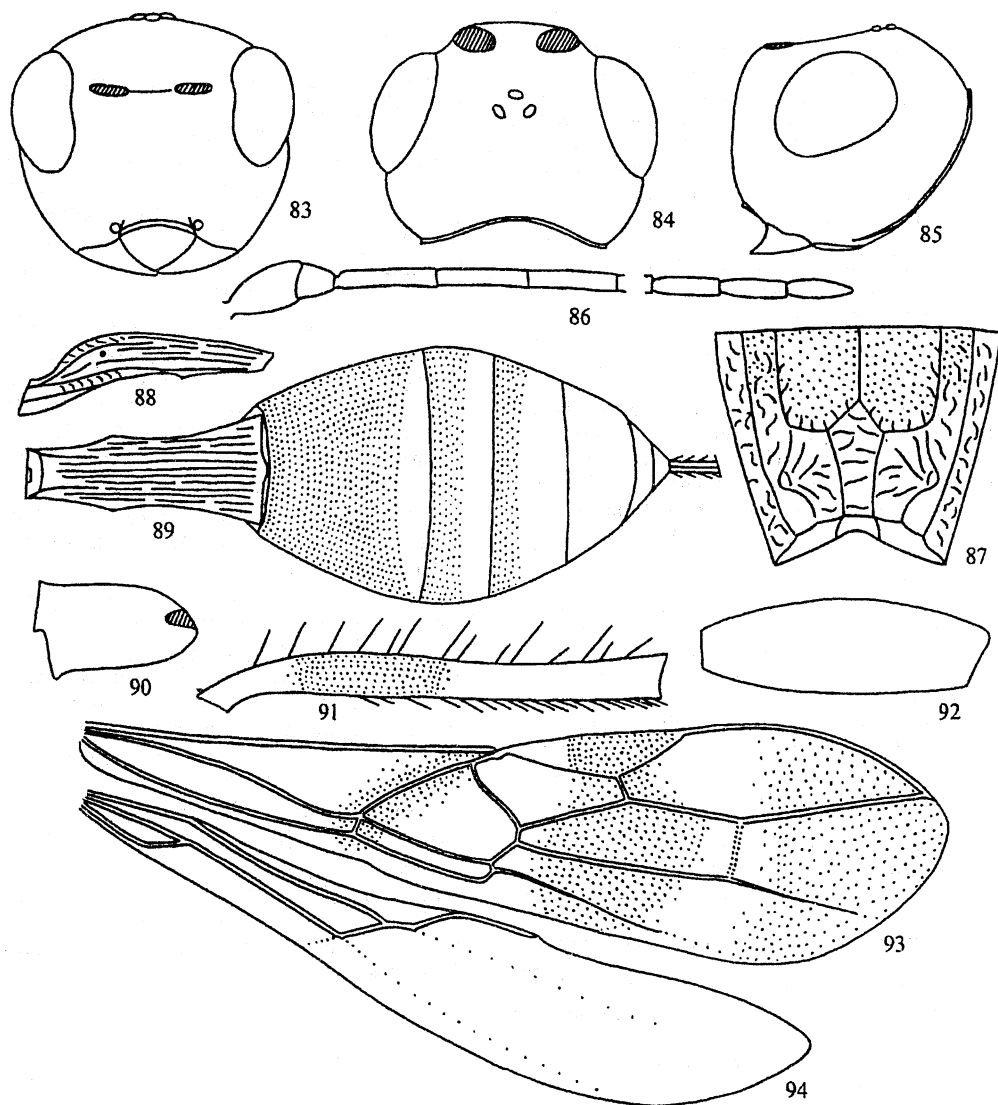
Holotype. ♀, Taiwan, Wu-feng, 28.III.1983 (H. & M. Townes) (AEI).

Description. Body length 2.7 mm; fore wing length 2.1 mm. Head width 1.4 times its median length. Temple roundly narrowed behind eye. Transverse diameter of eye 1.7 times length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL almost equal to Od, 0.33 times OOL. Eye 1.2 times as high as broad. Cheek height 0.6 times eye height and 1.3 times basal width of mandible. Face width slightly greater than eye height and height of face and clypeus combined. Clypeal suture present at short distance laterally only. Hypoclypeal depression small and round, its width 0.7 times distance from edge of depression to eye. Occipital carina lost near mandible and not fused with hypostomal one.

Antennae filiform, slender, 1.2 times as long as body, 26-segmented. 1st flagellar segment 5.5 times as long as its apical width, 1.1 times as long as 2nd segment. Penultimate segment 4 times as long as wide, 0.6 times as long as 1st segment, 0.9 times as long as apical segment, the latter obtuse apically.

Thorax. Length of thorax twice its height. Pronotal keel fine and fused medially with posterior margin of pronotum. Pronotal lateral depression striate. Mesoscutum rather highly and roundly raised above prothorax. Notauli rather deep, wide, complete, crenulate. Prescutellar depression densely granulate and with striae, 0.45 times as long as the convex scutellum. Postscutellum obtuse medially. Sternauli shallow, straight, crenulate, running along approximately half of lower part of mesopleurae. Subalar depression shallow and reticulo-granulate, with sparse striae.

Wing. Fore wing 4 times as long as wide. Radial vein arising behind middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. 2nd radial abscissa 4.8 times 1st abscissa and forming strongly obtuse angle with it, 0.6 times 3rd abscissa, nearly equal to 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 3.5 times its maximum width, 1.5 times length of brachial cell. Nervulus interstitial. Parallel vein arising from anterior third of distal margin of brachial cell. Mediocubital vein curved to anal vein in distal half. In hind wing, 1st abscissa



Figs 83-94. *Spathius paracritolaus* sp. n. 83, head, frontal view; 84, head, dorsal view; 85, head, lateral view; 86, basal and apical segments of antenna; 87, propodeum; 88, petiole, lateral view; 89, abdomen, dorsal view; 90, hind coxa; 91, hind tibia; 92, hind femur; 93, fore wing; 94, hind wing.

of mediocubital vein 0.6 times as long as 2nd abscissa. Recurrent vein interstitial.

Legs. Hind coxa with basoventral tooth. Hind femur 3 times as long as wide. Hind tarsus nearly as long as hind tibia. Hind basitarsus 0.6 times as long as 2nd-5th segments combined; 2nd tarsal segment half as long as basitarsus, 1.3 times as long as 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) slightly and regularly curved, thickened in basal

third, widened in apical quarter (dorsal view), with spiracular tubercles in basal third. Length of petiole twice its apical width, 1.5 times length of propodeum; apical width 1.5 times width at level of spiracles, 2.5 times its minimum width. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.3 times basal width of 2nd tergite, 0.7 times their maximum width. 2nd suture indistinct. Ovipositor straight. Ovipositor sheath 0.6

times as long as abdomen, 1.5 times as long as petiole, 0.4 times as long as fore wing.

Sculpture and pubescence. Vertex finely aciculate medially, its lateral part and entire temples smooth; frons densely and entirely aciculate; face with very dense, excessively fine, absolutely even, transverse aciculation (like the surface of a gramophone record). Mesoscutum finely and densely reticulate, with 2 longitudinal carinae medioposteriorly; lobes near notauli without rugae. Scutellum finely reticulate. Mesopleurae entirely finely and densely reticulate. Metapleurae granulate-rugulose. Propodeum granulate in anterior half, rugose in posterior half; areas distinctly marginate; areola narrow and long; median carina present in basal third, about twice as long as anterior sides of areola. Hind coxae finely reticulate. Petiole rugulose-striate. 2nd tergite entirely, 3rd in basal two-thirds, 4th and 5th in basal thirds very finely (especially 4th and 5th) and densely granulate, with fine aciculae basally. Mesoscutum with sparse, long, erect hairs along notauli and laterally only. Hairs of dorsal surface of hind tibia long, erect and sparse, their length 0.9-1 times maximum width of tibia.

Colour. Body light yellowish brown. Antennae light brown, slightly darker subapically. Palpi pale yellow. Legs pale yellowish brown, sometimes with reddish tint. Ovipositor sheath dark brown. Wings faintly infusate, with brown spots near basal vein and pterostigma. Pterostigma brown, pale in basal third.

Male unknown.

Discussion. This species is related to the Indian *S. critolaus* Nixon and *S. sul* Nixon and differ in having the frons densely and distinctly aciculate, propodeum with granulate and marginate basolateral areas, submedial cell of fore wing distinctly narrowed in apical half, parallel vein not interstitial, hairs of hind tibia nearly as long as tibial width.

***Spathius annuliventris* (Enderlein)**

(Figs 95-104)

Enderlein, 1912: 11 (*Stenophasmus*; holotype: ♀, "Formosa, Takao, H. Sauter, 11.08.[19]07", "Type" (red), "*Stenophasmus annuliventris* Enderl. ♀, Type, Dr. Enderlein det. 1912"; IZW; examined); Nixon, 1943: 448; Shenefelt & Marsh, 1976: 1388.

Material. Only holotype examined.

Description. Body length 3.9 mm. Head width 1.6 times its median length. Temple

roundly narrowed behind eye. Transverse diameter of eye 1.8 times length of temple. Ocelli rather small, in equilateral triangle; POL almost equal to Od, 0.3 times OOL. Eye 1.3 times as high as broad. Cheek height half eye height and nearly equal to basal width of mandible. Face width slightly greater than eye height and slightly less than height of face and clypeus combined. Clypeal suture absent. Hypoclypeal depression small and round, its width 0.6 times distance from edge of depression to eye. Occipital carina lost near mandible and not fused with hypostomal one.

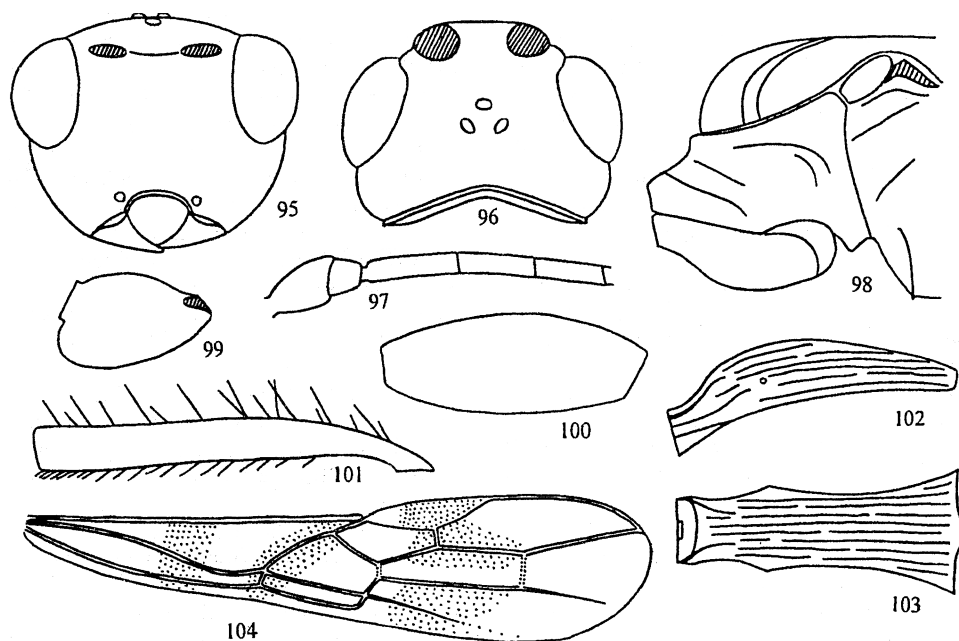
Antennae almost setiform, 32-segmented. 1st flagellar segment 4.5 times as long as its apical width, 1.25 times as long as 2nd segment. Penultimate segment 2.7 times as long as wide.

Thorax. Length of thorax twice its height. Pronotal keel very fine, separated from posterior margin of pronotum. Pronotal lateral depression finely sculptured, striate medially. Mesoscutum highly and roundly raised above prothorax. Notauli deep, complete, crenulate. Prescutellar depression densely rugulose, 0.25 times as long as the convex scutellum. Sternauli deep, straight, finely crenulate, running along approximately two-thirds of lower part of mesopleurae. Subalar depression shallow, densely granulate and with striae.

Wing. Radial vein arising from middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 4.7 times 1st abscissa and forming almost right angle with it, 0.7 times 3rd abscissa, 1.3 times 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 4.2 times maximum width. Nervulus and parallel veins interstitial. Mediocubital vein strongly curved to anal vein in distal half. In hind wing, 1st abscissa of mediocubital vein almost half as long as 2nd abscissa. Recurrent vein strongly antefurcal and unsclerotised.

Legs. Hind coxa small (its length 1.5 times maximum width), without basoventral tooth and corner. Hind femur 2.5 times as long as wide. Hind tarsus nearly equal to hind tibia. Hind basitarsus 0.45 times as long as 2nd-5th segments combined, 2nd tarsal segment half as long as basitarsus, as long as 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) slightly and regularly curved, distinctly thickened in basal third, distinctly widened in apical third (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.5 times its



Figs 95-104. *Spathius annuliventris* (Enderlein). 95, head, frontal view; 96, head, dorsal view; 97, 5 basal segments of antenna; 98, anterior part of thorax, lateral view; 99, hind coxa; 100, hind femur; 101, hind tibia; 102, petiole, lateral view; 103, petiole, dorsal view; 104, fore wing.

apical width, 1.2 times length of propodeum; apical width 1.3 times width at level of spiracles. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.8 times basal width of 2nd tergite. 2nd suture indistinct. Ovipositor straight. Ovipositor sheath 0.35 times as long as abdomen, slightly longer than petiole.

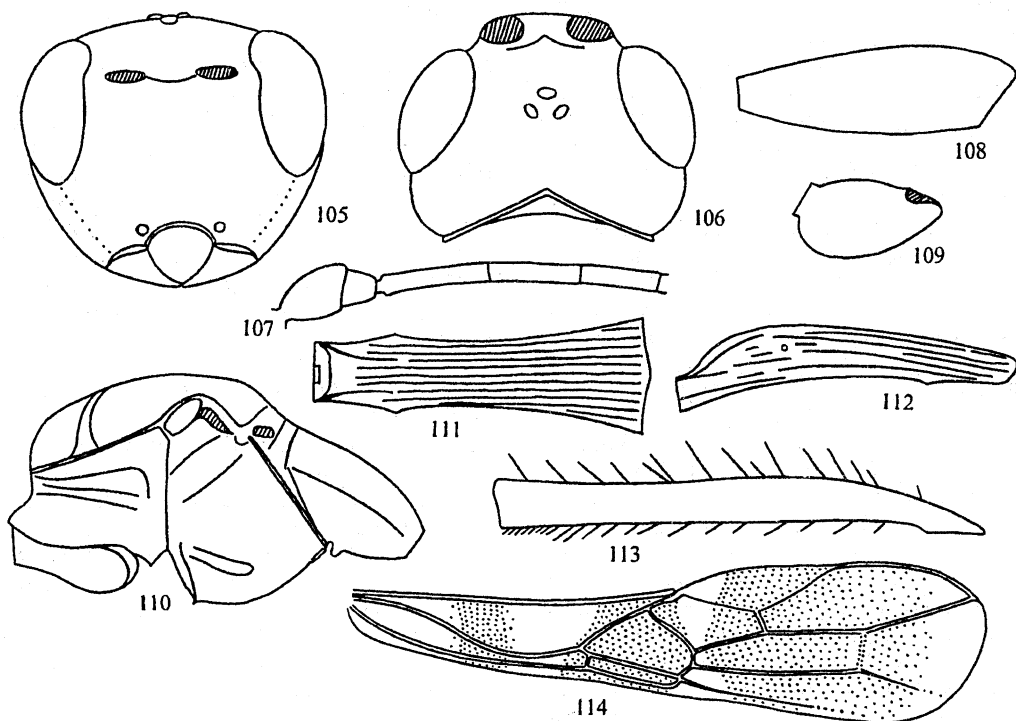
Sculpture and pubescence. Vertex and cheek finely granulate, with fine striae; frons distinctly striate; face with very dense, fine, absolutely even, transverse aciculation (like surface of gramophone record). Mesoscutum and scutellum densely and finely granulate; lobes near notauli without rugae. Mesopleurae smooth. Metapleurae densely granulate, rugulose in posterior third. Propodeum finely and densely granulate, with rugae posteriorly, areas indistinct, median carina in basal third very fine. Hind coxae finely and densely granulate. Petiole rugulose-striate. 2nd and 3rd tergites very densely and finely granulate. Other tergites smooth, only finely granulate basally. Body with long, erect and rather dense light hairs. Length of hairs of dorsal surface of hind tibia nearly equal to maximum width of tibia.

Colour. Body yellowish brown, 3rd-6th abdominal tergites with dark stripes at posterior margin. Antennae yellow, slightly darker apically. Palpi pale yellow. Legs yellow. Ovipositor sheath light brown in anterior half, black in posterior half. Wings hyaline, with several faintly infusate transverse stripes, among them wide stripe before curved part of mediocubital vein. Pterostigma brown, pale yellow in basal half.

Male unknown.

Discussion. This species is closely related to *S. fragilis* Nixon (Philippines) and differ by having the frons distinctly striate, antennae with 32 segments, mesoscutum highly and distinctly raised above prothorax, postscutellum without tooth, hind tibia with apical spines, abdominal petiole and ovipositor sheath shorter, 2nd and 3rd tergites densely granulate.

Remarks. I have examined 2 additional, non-type specimens (males?), possibly belonging to this species, from the collection of the Institute of Zoology in Warsaw. Unfortunately, these specimens are damaged: in one specimen ("Formosa, Byamma, H. Sauter S., VI.[19]07", "*Stenophasmus annuliventris* Enderl., ♂, ?, Dr. Enderlein det. 1912") head and distal part of abdomen, and in an-



Figs 105-114. *Spathius mimeticus* (Enderlein). 105, head, frontal view; 106, head, dorsal view; 107, 5 basal segments of antenna; 108, hind femur; 109, hind coxa; 110, thorax, lateral view; 111, petiole, dorsal view; 112, petiole, lateral view; 113, hind tibia; 114, fore wing.

other specimen ("Formosa, Takao, H. Sauter S. VIII.[19]07", "*Stenophasmus annuliventris* Enderl., ♂, ♀, Dr. Enderlein det. 1912") the whole abdomen are missing.

***Spathius mimeticus* (Enderlein), sp. dist.**
(Figs 105-114)

Enderlein, 1912: 11 (*Stenophasmus*; lectotype: ♀, "Formosa, Takao, H. Sauter S., 20.IV.[19]07", "Type" (red), "*Stenophasmus mimeticus* Enderl. ♀, Type, Dr. Enderlein det. 1912"; IZW; here designated); Nixon, 1943: 449; Shenefelt & Marsh, 1976: 1388 [as synonym of *S. annuliventris* (End.)].

Material. Taiwan: 1 ♀, lectotype; 1 ♀, "Formosa, Takao, H. Sauter S., 13.I.[19]07", "Co-Type" (yellow), "*Stenophasmus mimeticus* Enderl. ♀, Type, Dr. Enderlein det. 1912" (paralectotype).

Description. Body length 2.5-2.7 mm. Head width 1.3-1.5 times its median length. Temple roundly narrowed behind eye. Transverse diameter of eye 1.8-2 times length of temple. Ocelli rather small, in equilateral triangle; POL almost equal to Od, 0.3 times

OOL. Eye 1.3 times as high as broad. Cheek height half eye height and nearly equal to basal width of mandible. Face width equal to eye height and slightly less than height of face and clypeus combined. Clypeal suture absent. Hypoclypeal depression small and round, its width 0.6 times distance from edge of depression to eye. Occipital carina lost near mandible and not fused with hypostomal one.

Antennae setiform, 23-segmented. 1st flagellar segment 5-6 times as long as its apical width, 1.25 times as long as 2nd segment. Penultimate segment 4 times as long as wide.

Thorax. Length of thorax 1.7 times its height. Pronotal keel lost. Pronotal lateral depression finely striate. Mesoscutum highly and roundly raised above prothorax. Notauli rather deep, lost in posterior half, crenulate. Prescutellar depression densely rugulose, 0.33 times as long as the convex scutellum. Sternauli shallow, straight, finely crenulate, running along approximately third of

lower part of mesopleurae. Subalar depression shallow and smooth.

Wing. Radial vein arising before middle of pterostigma. Radial cell not shortened. 2nd radial abscissa 4 times 1st abscissa and forming almost right angle with it, 0.9-1 times 3rd abscissa, 1.5-1.6 times 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 4-4.2 times its maximum width. Distance from nervulus to basal vein 0.3-0.7 times nervulus length. Parallel vein interstitial. Mediocubital vein strongly curved to anal vein in distal half. In hind wing, 1st abscissa of mediocubital vein almost half as long as 2nd abscissa. Recurrent vein strongly antefurcal and unsclerotized.

Legs. Hind coxa small (its length about 1.5 times maximum width), without basoventral tooth and corner. Hind femur 3 times as long as wide. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.5-0.6 times as long as 2nd-5th segments combined; 2nd tarsal segment half as long as basitarsus, equal to 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) almost straight, distinctly thickened in basal third, distinctly widened in apical quarter (dorsal view), with spiracular tubercles in basal third. Length of petiole 3 times its apical width, 1.7 times length of propodeum; apical width 1.3 times width at level of spiracles. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.5-1.7 times basal width of 2nd tergite. 2nd suture indistinct. Ovipositor straight. Ovipositor sheath 0.55-0.6 times as long as abdomen, 1.4-1.5 times as long as petiole.

Sculpture and pubescence. Vertex and frons densely and finely aciculate; cheek finely granulate, with fine striae; face with very dense, excessively fine, absolutely even, transverse aciculation (like surface of gramophone record). Mesoscutum and scutellum densely and finely granulate; lobes near notauli without rugae. Mesopleurae entirely densely and finely granulate. Metapleurae densely granulate, rugulose in posterior third. Propodeum mostly densely granulate, areas indistinct, median carina very fine in basal third. Hind coxae finely and densely granulate. Petiole rugulose-striate. 2nd and 3rd tergites very densely and finely granulate. Other tergites smooth, only finely granulate basally. Body with rather short, erect and rather dense light hairs. Length of hairs of dorsal surface of hind tibia 0.7-0.8 times maximum width of tibia.

Colour. Thorax reddish brown, head and petiole paler, remainder of abdominal tergites usually darker. Two basal antennal segments pale brown, following segments distinctly darker. Palpi dark reddish brown. Legs reddish brown, hind legs dark, all tarsi yellow, fore and middle coxae pale brown. Ovipositor sheath light brown in anterior half, black in posterior half. Wings infusate, with 4 narrow hyaline transverse stripes, one of them across curved part of mediocubital vein. Pterostigma brown, pale yellow in basal third.

Male unknown.

Discussion. This species is closely related to *S. araeceri* Nixon (Indonesia, Malaysia) and differ by having the discoidal cell entirely setose, anterolateral corner of median lobe of mesoscutum fine and short, notauli distinct in basal half. Also *S. mimeticus* is related to *S. rhianus* Nixon (Philippines) and differ by having mesoscutum strongly raised above prothorax and without striae posteriorly, scutellum strongly convex, mesopleurae granulate, 2nd and 3rd tergites densely and finely granulate.

Spathius eunyce Nixon

Nixon, 1943: 284; Shenefelt & Marsh, 1976: 1399; Chao, 1978: 174.

Material. Taiwan: 1 ♂, "Tainan, Formosa, H. Sauter", "22.VII" (DEI).

Distribution. China (Guangxi), Philippines, Taiwan (new record).

Spathius medon Nixon

Nixon, 1943: 286; Shenefelt & Marsh, 1976: 1408.

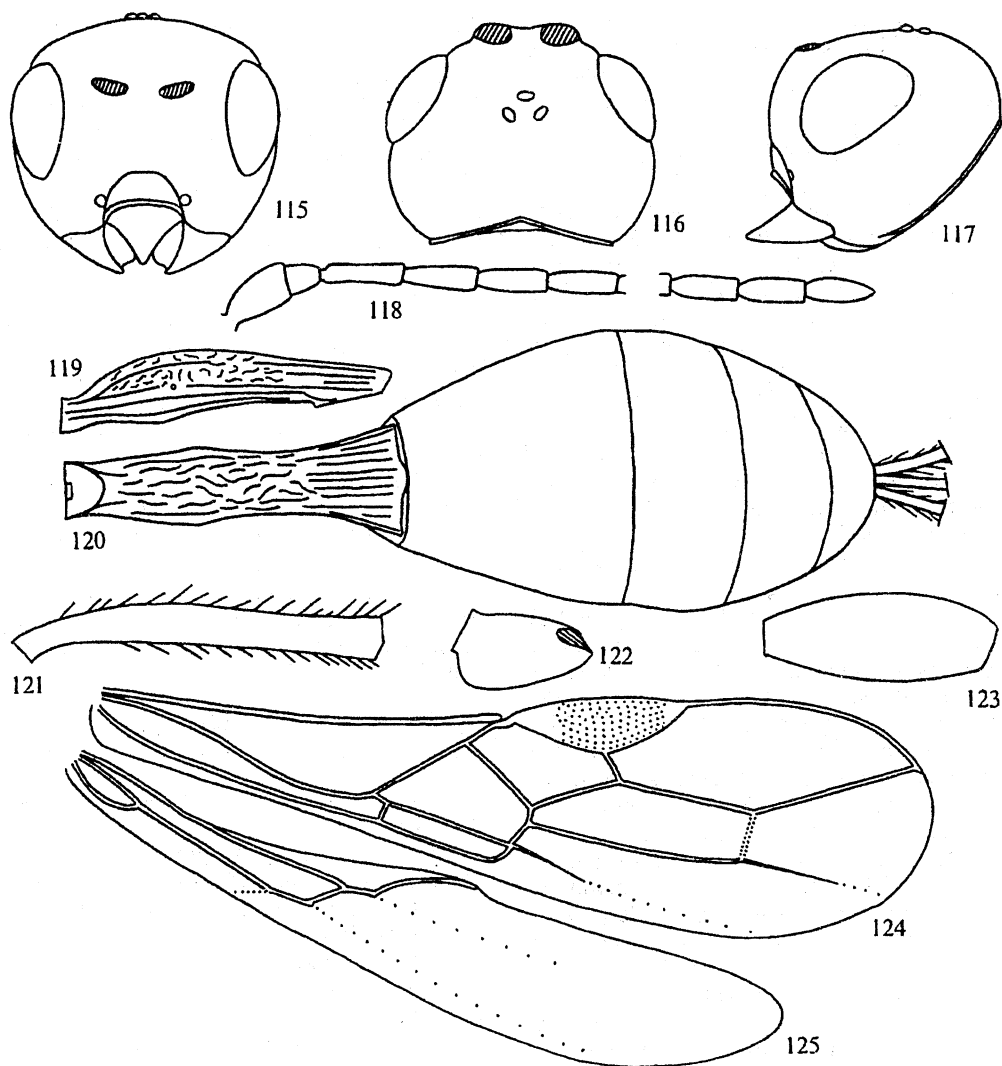
Material. Taiwan: 1 ♀, "Formosa, Sauter", "Polisha, 1909. X"; 1 ♀, "Fuhosho, Formosa, H. Sauter", "IX".

Distribution. India, Sri Lanka, Taiwan (new record).

Spathius wusheensis sp. n. (Figs 115-125)

Holotype. ♀, Taiwan, Wushe, 1150 m, 15.V.1983 (H. Townes) (AEI).

Description. Body length 2.5 mm; fore wing length 2 mm. Head width 1.3 times its median length. Temple behind eye convex anteriorly, roundly narrowed posteriorly. Transverse diameter of eye nearly equal to length of temple. Ocelli small, almost in equilateral triangle; POL about 1.5 times



Figs 115-125. *Spathius wusheensis* sp. n. 115, head, frontal view; 116, head, dorsal view; 117, head, lateral view; 118, basal and apical segments of antenna; 119, petiole, lateral view; 120, abdomen, dorsal view; 121, hind tibia; 122, hind coxa; 123, hind femur; 124, fore wing; 125, hind wing.

Od, 0.4 times OOL. Eye 1.4 times as high as broad. Cheek height half eye height and 0.9 times basal width of mandible. Face width 1.3 times eye height and 1.35 times height of face and clypeus combined. Clypeal suture distinct. Hypoclypeal depression rather small and round, its width 0.9 times distance from edge of depression to eye. Occipital carina lost near mandible and not fused with hypostomal one.

Antennae moniliform, slightly thickened apically, 0.8 times as long as body, 18-segmented. 1st flagellar segment 3 times as long

as its apical width, as long as 2nd segment. Penultimate segment 2.5 times as long as wide, 0.8 times as long as 1st segment, 0.9 times as long as apical segment, the latter obtuse apically.

Thorax. Length of thorax 2.4 times its height. Pronotal keel fine and fused with posterior margin of pronotum. Pronotal lateral depression densely striate. Mesoscutum rather highly and roundly raised above prothorax. Notauli deep, fused in posterior third of mesoscutum, crenulate. Prescutellar depression rugulose, 0.4 times as long as the

convex scutellum. Sternauli deep, rather narrow, slightly curved medially, crenulate, running along almost entire of lower part of mesopleurae. Subalar depression shallow and striate-rugulose.

Wing. Fore wing 3.5 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarp 1.4 times as long as pterostigma. 2nd radial abscissa 4.5 times 1st abscissa and forming obtuse angle with it, 0.8 times the straight 3rd abscissa, 1.7 times 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 3.5 times its maximum width, 1.6 times length of brachial cell. Distance from nervulus to basal vein almost equal to nervulus length. Parallel vein almost interstitial. Mediocubital vein strongly curved to anal vein in distal half. In hind wing, 1st abscissa of mediocubital vein 0.35 times as long as 2nd abscissa. Recurrent vein strongly ante-furcal.

Legs. Hind coxa without basoventral tooth and corner. Middle tarsi very short, their 1st segment about twice as long as wide. Hind femur 2.5 times as long as wide. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.8 times as long as 2nd-5th segments combined; 2nd tarsal segment 0.3 times as long as basitarsus, 0.8 times as long as 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) almost straight, thickened in basal half, distinctly widened in apical quarter (dorsal view), with spiracular tubercles in basal third. Length of petiole 3 times its apical width, 1.7 times length of propodeum; apical width 1.6 times width at level of spiracles. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.8 times basal width of 2nd tergite, 0.8 times their maximum width. 2nd suture very fine. Ovipositor slightly curved upwards. Ovipositor sheath 0.8 times as long as body, 1.1 times as long as fore wing.

Sculpture and pubescence. Head smooth, face densely rugulose-striate. Mesoscutum finely granulate, with one median stria in posterior half; lobes near notauli without rugae. Scutellum very finely granulate. Mesopleurae finely reticulate, partly almost smooth. Metapleurae rugulose. Propodeum entirely reticulate-rugulose, with granulation, especially basally; areas indistinct. Hind coxae very finely granulate, striate dorsally. Petiole rugulose, almost smooth apically. Other tergites smooth. Mesoscutum with short and semi-erect hairs along notauli and laterally only. Hairs of hind

legs short and dense, length of hairs of dorsal surface of hind tibia 0.5-0.6 times maximum width of tibia.

Colour. Body light reddish brown, posterior half of abdomen darker. Antennae pale brown, darker in apical quarter. Palpi yellow. Legs yellow, all tibiae pale basally. Ovipositor sheath yellow, dark apically. Wings infusate. Pterostigma dark brown, pale yellow in basal quarter.

Male unknown.

Discussion. This species is closely related to *S. psammathe* Nixon (Philippines) and differs in having the temple convex behind eye, antennae 18-segmented, hind tarsi slender, hairs of hind tibia longer, 2nd radial abscissa distinctly shorter than 3rd abscissa, ovipositor sheath shorter than body. Also *S. wusheensis* is related to *S. semele* Nixon (Philippines) and differ by having the temple convex behind eye, frons and vertex smooth, antenna 18-segmented, mesonotum hairs present along notauli and laterally only, propodeum without distinct areas, hind coxa round basolaterally.

***Spathius convexitemporalis* sp. n.**

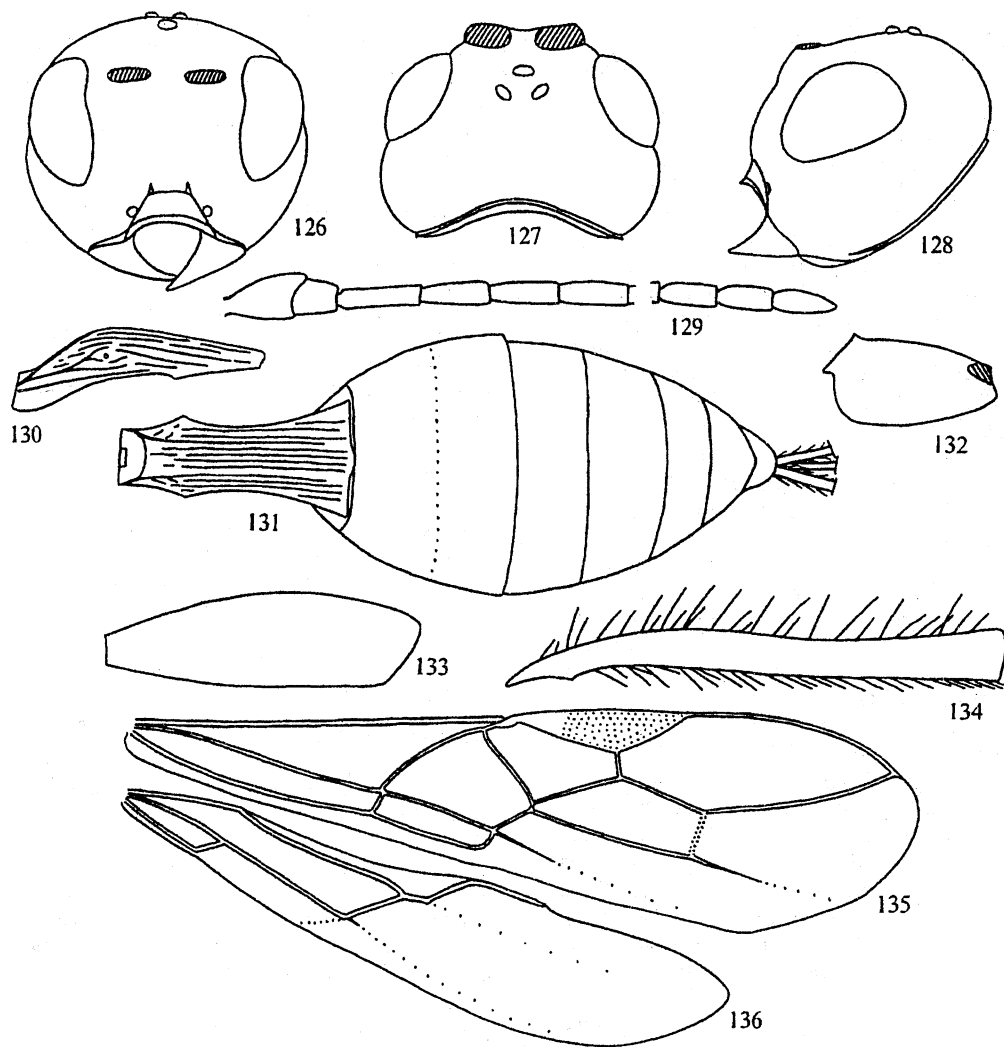
(Figs 126-136)

Holotype. ♀, Taiwan, Wushe, 1150 m, 13.IV.1983 (H. Townes) (AEI).

Description. Body length 3.5 mm; fore wing length 3 mm. Head width 1.4 times its median length. Temple distinctly roundly convex behind eye. Transverse diameter of eye equal to length of temple. Ocelli small, in triangle with base 1.2 times its sides; POL almost equal to Od, 0.35 times OOL. Eye 1.3 times as high as broad. Cheek height 0.6 times eye height and equal to basal width of mandible. Face width slightly greater than eye height and than height of face and clypeus combined. Clypeal suture distinct. Hypoclypeal depression round, its width 0.8 times distance from edge of depression to eye. Occipital carina roundly fused with hypostomal one near mandible.

Antennae filiform, slender, about 0.8 times as long as body, 23-segmented. 1st flagellar segment 3.5 times as long as its apical width, 1.2 times as long as 2nd segment. Penultimate segment 2.5 times as long as wide, 0.6 times as long as 1st segment, 0.9 times as long as apical segment, the latter pointed apically and without spine.

Thorax. Length of thorax 1.8 times its height. Pronotal keel distinctly separated from posterior margin of pronotum. Prono-



Figs 126-136. *Spathius convexitemporalis* sp. n. 126, head, frontal view; 127, head, dorsal view; 128, head, lateral view; 129, basal and apical segments of antenna; 130, petiole, lateral view; 131, abdomen, dorsal view; 132, hind coxa; 133, hind tibia; 134, hind femur; 135, fore wing; 136, hind wing.

tal lateral depression coarsely striate. Mesoscutum highly and roundly raised above prothorax. Notauli rather deep, complete, shallow in posterior third, crenulate. Prescutellar depression densely rugulose, 0.4 times as long as the flat scutellum. Postscutellum obtuse medially. Sternauli rather shallow, curved, crenulate, running along approximately half of lower part of mesopleurae. Subalar depression shallow and rugose-striate.

Wing. Fore wing 3.8 times as long as wide. Radial vein arising behind middle of pterostigma. Radial cell slightly shortened; metacarpus 1.3 times as long as pterostigma.

2nd radial abscissa 3.5 times 1st abscissa and forming distinct angle with it, half 3rd abscissa (which is weakly curved), almost equal to 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 3 times its maximum width, 1.4 times length of brachial cell. Nervulus almost interstitial. Parallel vein interstitial. Mediocubital vein not curved to anal vein. In hind wing, 1st abscissa of mediocubital vein 0.7 times as long as 2nd abscissa. Recurrent vein interstitial.

Legs. Hind coxa without basoventral tooth, but with round corner. Hind femur 3.3 times as long as wide. Hind tarsus 0.8

times as long as hind tibia. Hind basitarsus 0.7 times as long as 2nd-5th segments combined; 2nd tarsal segment 0.4 times as long as basitarsus, as long as 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) distinctly and regularly curved, thickened in basal half, distinctly widened in apical quarter (dorsal view), with large spiracular tubercles in basal third. Length of petiole twice its apical width, 1.8 times length of propodeum; apical width 1.3 times width at level of spiracles. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.2 times basal width of 2nd tergite, 0.7 times their maximum width. 2nd suture indistinct. Ovipositor straight. Ovipositor sheath nearly as long as abdomen, 2.8 times as long as petiole, 0.6 times as long as fore wing.

Sculpture and pubescence. Vertex finely striate medially, almost smooth laterally. Frons reticulate-rugulose; face rugulose-striate; temple smooth. Mesoscutum finely granulate, with sparse rugae, undulately striate medio-posteriorly; lobes near notauli with short rugae. Scutellum almost smooth, finely reticulate-rugulose posteriorly. Mesopleurae smooth, finely sculptured posteriorly. Metapleurae rugose. Propodeum sparsely rugulose, in part almost smooth; areas distinctly marginate; areola short; petiolate area long and rather narrow; median carina distinct in basal third, 1.5 times as long as anterior sides of areola. Hind coxae finely sculptured. Petiole reticulate-rugose in anterior half, striate in posterior half; dorsal carinae distinct and long. Other tergites smooth. Mesoscutum with long, erect white hairs along notauli and laterally only. Hairs of dorsal surface of hind tibia long as well as short, length of long hairs 1-1.2 times maximum width of tibia.

Colour. Body dark reddish brown, abdomen behind petiole lighter, head light reddish brown. Antennae pale brown, darker subapically. Palpi pale yellow. Legs reddish brown, all tibiae pale basally. Ovipositor sheath yellow in anterior half, dark brown in posterior half. Wings faintly infusate. Pterostigma brown, pale in basal third.

Male unknown.

Discussion. This species is related to *S. sabronensis* Nixon (New Guinea) because of temple strongly convex and differ by having the pronotal carina not connected with posterior margin of pronotum, mesonotum with sparse and rather long hairs, 1st flagellar segment shorter, ocelli placed near middle of eyes.

Also *S. convexitemporalis* is related to *S. colophon* Nixon (Borneo, Philippines) and differ by having the temple strongly convex behind eye, vertex finely striate medially only, antennae shorter and 23-segmented, hind coxa without tooth, ovipositor sheath shorter.

***Spathius yunnanensis* Chao**

Chao, 1977: 215.

Material. **Taiwan:** 2 ♀, Wushe, 1150 m, 7 and 26.IV.1983 (H. Townes); 1 ♀, Wu-feng, 20.III.1983 (H. & M. Townes).

Distribution. China (Yunnan), Taiwan (new record).

***Spathius miletus* Nixon**

Nixon, 1943: 317 (holotype: ♀, "Formosa, Hoozan, XI.[19]10, Sauter S.G.", "*Spathius melitus* Nixon, Type ♀"; ZMB; examined); Shenefelt & Marsh, 1976: 1408.

Material. Only holotype examined.

Distribution. Taiwan.

***Spathius brevicaudis* Ratzeburg**

Shenefelt & Marsh, 1976: 1391; Belokobylskij & Tobias, 1986: 31.

Material. **Taiwan:** 6 ♀, Wushe, 1150 m, 2, 7, 19.IV, 3, 15.V.1983 (H. Townes).

Distribution. West Europe; Japan, Kazakhstan, Russia (European part, Siberia, Far East), Taiwan (new record).

***Spathius apicalis* (Westwood)**

Nixon, 1943: 378; Shenefelt & Marsh, 1976: 1389.

Stenophasmus enderleini Strand, 1913: 212 (holotype: ♀, "Kankau (Koshun), Formosa, H. Sauter, VI.1912", "Holotype", "*Stenophasmus Enderleini* m. ♀, Strand det."; DEI; examined), **syn. n.**

Material. **Taiwan:** 1 ♀, holotype of *S. enderleini*; 2 ♀, "Formosa, Sauter", "Fuhosho, 1909.VIII."

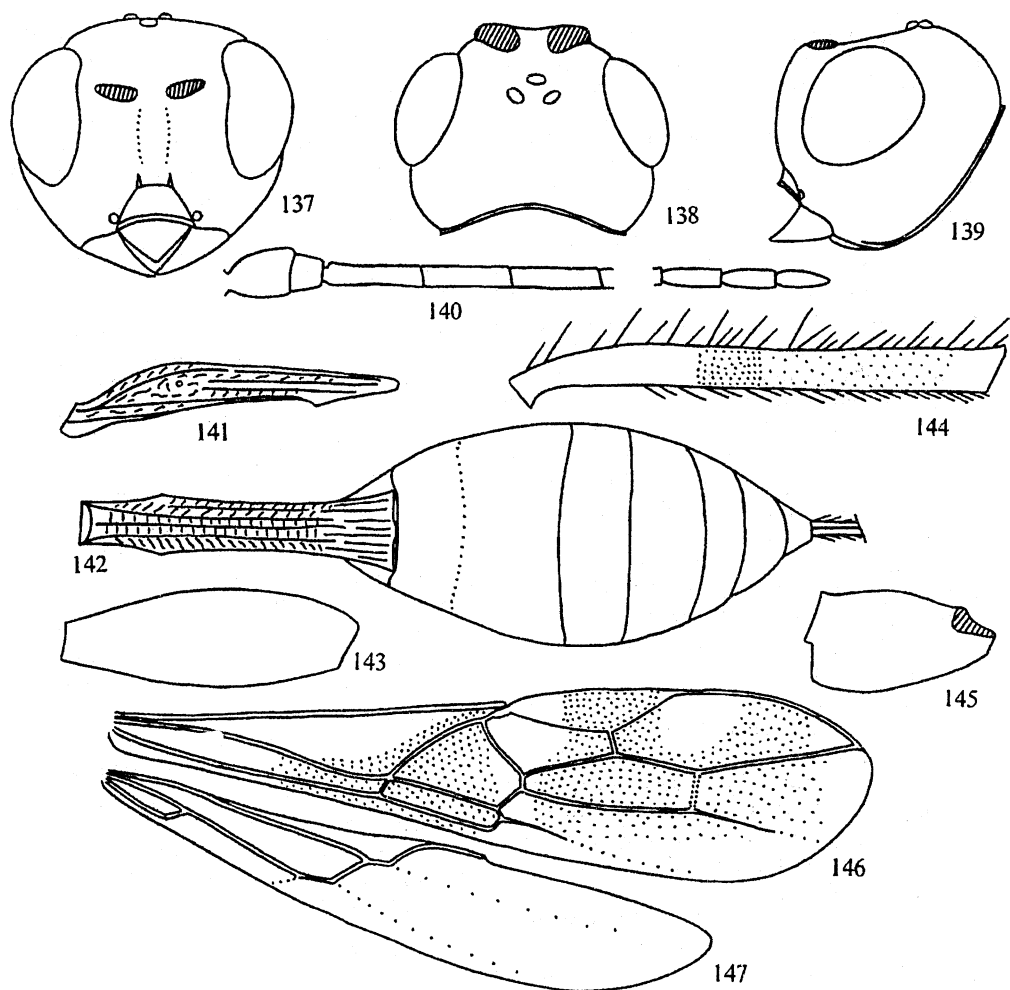
Distribution. Andamans Is., India, Indonesia, Malaysia, New Guinea, Philippines, Taiwan.

***Spathius taiwanicus* sp. n.**

(Figs 137-147)

Holotype. ♀, **Taiwan**, Wushe, 1150 m, 22.V.1983 (H. Townes) (AEI).

Description. Body length 3.5 mm; fore wing length 2.8 mm. Head width 1.4 times



Figs 137-147. *Spathius taiwanicus* sp. n. 137, head, frontal view; 138, head, dorsal view; 139, head, lateral view; 140, basal and apical segments of antenna; 141, petiole, lateral view; 142, abdomen, dorsal view; 143, hind femur; 144, hind tibia; 145, hind coxa; 146, fore wing; 147, hind wing.

its median length. Temple roundly narrowed behind eye. Transverse diameter of eye 1.6 times length of temple. Ocelli small, in triangle with base 1.4 times its sides; POL slightly greater than Od, almost half OOL. Eye 1.3 times as high as broad. Cheek height 0.4 times eye height and 0.8 times basal width of mandible. Face width almost equal to eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct. Hypoclypeal depression round, its width nearly equal to distance from edge of depression to

eye. Occipital carina lost near mandible and not fused with hypostomal one.

Antennae filiform, 1.5 times as long as body, 35-segmented. 1st flagellar segment 5 times as long as its apical width, nearly as long as 2nd segment. Penultimate segment 3 times as long as wide, 0.6 times as long as 1st segment, as long as apical segment, the latter pointed apically.

Thorax. Length of thorax 2.1 times its height. Pronotal keel strong (especially medially) and distinctly separated from posterior margin of pronotum. Pronotal lateral

depression distinctly and densely striate. Mesoscutum weakly and roundly raised above prothorax. Notauli deep, complete, crenulate. Prescutellar depression rugulose, with median carina, 0.33 times as long as the convex scutellum. Sternauli deep, straight, finely crenulate, running along approximately half of lower part of mesopleurae. Subalar depression shallow and rugulose-granulate.

Wing. Fore wing 4 times as long as wide. Radial vein arising slightly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.2 times as long as pterostigma. 2nd radial abscissa 3.2 times 1st abscissa and forming obtuse angle with it, half 3rd abscissa (which is straight), 0.9 times 1st radiomedial vein. 2nd radiomedial cell not narrowed distally, its length 3.5 times its maximum width, 1.5 times length of brachial cell. Nervulus almost interstitial. Parallel vein arising from anterior third of distal margin of brachial cell. Mediocubital vein slightly curved to anal vein in distal half. In hind wing, 1st abscissa of mediocubital vein 0.6 times as long as 2nd abscissa. Recurrent vein strongly antefurcal.

Legs. Hind coxa without basoventral tooth, but with corner. Hind femur 3 times as long as wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.8 times as long as 2nd-5th segments combined; 2nd tarsal segment 0.4 times as long as basitarsus, 1.2 times as long as 5th segment (without pretarsus).

Abdomen. Petiole (lateral view) straight, thickened in basal third, widened in apical fifth (dorsal view), with spiracular tubercles in basal quarter. Length of petiole almost 4 times its apical width, twice length of propodeum; apical width 1.4 times width at level of spiracles. 2nd tergite without separate laterotergites. Median length of 2nd and 3rd tergites combined 1.4 times basal width of 2nd tergite, 0.7 times their maximum width. 2nd suture indistinct. Ovipositor straight. Ovipositor sheath 1.2 times as long as abdomen, nearly as long as abdomen and propodeum combined, 0.9 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth; frons densely striate; face striate, with dense granulation. Mesoscutum reticulo-granulate, with 2 longitudinal and several transverse striae medioposteriorly; lobes near notauli without rugae. Scutellum reticulo-granulate. Mesopleurae densely and finely reticulate. Metapleurae densely rugu-

lose. Propodeum densely reticulo-granulate in basal two-thirds, rugulose in apical third; areas distinctly marginate, areola small and almost pentagonal, median carina longer than half of propodeum. Hind coxae densely granulate. Petiole rugulose-striate. 2nd and 3rd tergites (including laterotergites) finely, densely and medially concentrically aciculate; 4th and 5th tergites very finely transversely aciculate. Mesoscutum with sparse, long, erect white hairs along notauli and laterally only. Hairs of dorsal surface of hind tibia long as well as short, semi-erect, length of long hairs 0.9-1.1 times maximum width of tibia.

Colour. Body dark reddish brown, head, prothorax and gaster lighter. Antennae light reddish brown, darker subapically. Palpi pale yellow. Fore and middle legs light reddish brown, coxae, trochanters, base of femora, base and apex of tibiae paler. Hind leg (dark) reddish brown, trochanter, base of femur, basal third and apex of tibia, basitarsus apically and 3 following tarsal segments pale yellow. Ovipositor sheath light reddish brown, dark apically. Wings infuscate, with dark spots near basal vein and pterostigma. Pterostigma dark brown, pale in basal third.

Male unknown.

Discussion. This species is related to *S. chrysogonus* Nixon (Borneo) and differ by having the fore wing with big dark spots, vertex entirely smooth, mesopleurae entirely and rather finely rugulose-reticulate, abdominal aciculation very fine, ovipositor sheath shorter.

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I wish to express my sincere thanks to Dr. T. Huddleston (London), Dr. E. Kierych (Warsaw), Dr. F. Koch (Berlin), Dr. A. Taeger (Eberswalde), Dr. H. Townes (Gainesville), Dr. R. Wharton (College Station, Texas) for the loan of the type and other interesting material from the Taiwan and Oriental faunas.

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