

THE SPECIES OF THE GENUS *SPATHIUS* NEES, 1818 (HYMENOPTERA: BRACONIDAE: DORYCTINAE) NOT INCLUDED IN THE MONOGRAPH BY NIXON (1943)

SERGEY A. BELOKOBYSLSKIJ

Zoological Institute Russian Academy of Sciences, St. Petersburg 199034, Russia
Muzeum i Instytut Zoologii PAN, Wilcza 64, 00-679 Warszawa, Poland

Abstract.— A revision of the species of *Spathius* Nees, 1818 not included in the monograph by Nixon (1943) is presented. The next species of *Spathius* from the several groups of species are redescribed and/or introduced into Nixon's (1943) key to facilitate correct determination: group of *S. antennalis* Szépligeti (*alipes* Wilkinson) *S. antennalis* Szépligeti, 1905, *S. chunliuae* Chao, 1956, *S. euthyradius* Chao, 1978, *S. fuscipennis* Ashmead, 1905, *S. flavofulvus* Nixon, 1943, *S. radialis* Szépligeti, 1908; group of *S. apidanus* Nixon *S. minutissimus* Szépligeti, 1908; group of *S. arcesius* Nixon *S. bekilyensis* Granger, 1949; group of *S. briareus* Nixon *S. variipes* Szépligeti, 1905; group of *S. capys* Nixon *S. wusheensis* Belokobylskij, 1996; group of *S. cassidorus* Nixon *S. albiventris* Szépligeti, 1905, *S. minutus* Szépligeti, 1900; group of *S. elaboratus* Wilkinson *S. obesus* (Enderlein, 1912); group of *S. exarator* (Linnaeus) *S. amoenus* Belokobylskij, 1998, *S. canariensis* Hedqvist, 1976, *S. cavus* Belokobylskij, 1998, *S. depressithorax* Belokobylskij, 1998, *S. dentatus* Telenga, 1941, *S. maderi* Fahringer, 1930 (status nova), *S. lehrri* Belokobylskij, 1998, *S. phymatodis* Fischer, 1966, *S. planus* Belokobylskij, 1998; group of *S. fasciatus* Walker *S. baiun* Belokobylskij, 1998, *S. clavifemur* Belokobylskij, 1998, *S. convexitemporalis* Belokobylskij, 1996, *S. esakii* Watanabe, 1945, *S. flavicornis* Szépligeti, 1913, *S. fulvus* Szépligeti, 1905, *S. hikoensis* Belokobylskij, 1998, *S. javanicus* Szépligeti, 1908, *S. kunashiri* Belokobylskij, 1998, *S. leschii* Belokobylskij, 1998, *S. lesovik* Belokobylskij, 1998, *S. pellitus* Enderlein, 1912, *S. robustus* Belokobylskij, 1998, *S. rufobrunneus* Granger, 1949, *S. rufotestaceus* Motschoulsky, 1863, *S. spasskensis* Belokobylskij, 1998, *S. spectabilis* Granger, 1949, *S. sutshanicus* Belokobylskij, 1998, *S. testaceus* Szépligeti, 1902, *S. tutuilensis* Fullaway, 1940, *S. vladimiri* Belokobylskij, 1998, *S. xanthocephalus* Chao, 1977, *S. yunnanensis* Chao, 1977; group of *S. imbecillus* Enderlein *S. sumatranus* (Enderlein, 1912); group of *S. insignis* Granger (new group) *S. insignis* Granger, 1949; group of *S. labdacus* Nixon *S. alexandri* Belokobylskij, 1989, *S. polonicus* Niezabitowski, 1910, *S. udaegae* Belokobylskij, 1994; group of *S. philotas* Nixon *S. melleus* Brues, 1918; group of *S. piperis* Wilkinson – *S. philippinensis* Ashmead, 1904; group of *S. ruficeps* Smith *S. honshuensis* Belokobylskij, 1998, *S. manni* Brues, 1918, *S. pilosus* Szépligeti, 1910, *S. taiwanicus* Belokobylskij, 1996, *S. trichiosomus* Cameron, 1910; group of *S. rusticulus* Wilkinson *S. mimeticus* (Enderlein, 1912); group of *S. testaceitarsis* Cameron *S. solox* Enderlein, 1912; group of *S. tityrus* Nixon *S. machanaoensis* Shenefeld et Marsh, 1976; group of *S. urios* Nixon *S. annuliventris* (Enderlein, 1912); group of *S. vulnificus* Wilkinson *S. paracritolaus* Belokobylskij, 1996. The neotype of *S. polonicus* Niezabitowski, 1910 and the lectotypes of *Spathius fuscipennis* Ashmead, 1905, *S. bekilyensis* Granger, 1949, *S. spectabilis* Granger, 1949, *S. insignis* Granger, 1949 and *Stenophasmus sumatranus* Enderlein, 1912 are designated here. Nine new synonyms are given: *Spathius antennalis* Szépligeti, 1905 = *S. alipes* Wilkinson, 1931 (**syn. nov.**); *S. melpomene* Nixon, 1943 = *S. deccanensis* Kurhade et Nikam, 1994 (**syn. nov.**); *Spathius fuscipennis* Ashmead, 1905 = *S. evippe* Nixon, 1943 (**syn. nov.**); *Spathius laeviceps* Brues, 1924 = *S. flavofulvus* Nixon, 1943 (**syn. nov.**); *Spathius helle* Nixon, 1943 = *S. xanthocephalus* Chao, 1977 (**syn. nov.**); *Stenophasmus testaceitarsis* Cameron, 1908 = *Spathius solox* Enderlein, 1912 (**syn. nov.**); *Spathius guamensis* Nixon, 1943 = *S. machanaoensis* Shenefeld et Marsh, 1976 (**syn. nov.**); *Spathius pedestris* var. *maderi* Fahringer, 1930 = *S. hirtus* Hedqvist, 1976 (**syn. nov.**); *Ichneumon rubidus* Rossi, 1794 = *S. depressus* Hedqvist, 1976 (**syn. nov.**). The name of the *S. alipes* Wilkinson group is changed to the *S. antennalis* Szépligeti group; the *S. sinicus* Chao group is united with the *S. exarator* (Linnaeus) group. A new group of species – the *S. insignis* Granger group is described. *Spathius albonervosus* Motschoulsky, 1863 is assigned to the family Bethyloidea.



Key words.— Hymenoptera, Braconidae, *Spathius*, systematic, redescriptions, synonyms.

Contents

INTRODUCTION	348
SYSTEMATIC PART	350
Group of <i>S. antennalis</i> Szépligeti (<i>alipes</i> Wilkinson)	350
Group of <i>S. apidanus</i> Nixon	363
Group of <i>S. arcesius</i> Nixon	365
Group of <i>S. briareus</i> Nixon	368
Group of <i>S. capys</i> Nixon	370
Group of <i>S. cassidorus</i> Nixon	370
Group of <i>S. elaboratus</i> Wilkinson	375
Group of <i>S. exarator</i> Linnaeus	377
Group of <i>S. fasciatus</i> Walker	398
Group of <i>S. imbecillus</i> Enderlein	452
Group of <i>S. insignis</i> Granger (new group)	454
Group of <i>S. labdacus</i> Nixon	457
Group of <i>S. philotas</i> Nixon	464
Group of <i>S. piperis</i> Wilkinson	466
Group of <i>S. ruficeps</i> Smith	469
Group of <i>S. rusticulus</i> Nixon	478
Group of <i>S. testaceitarsis</i> Cameron	478
Group of <i>S. tityrus</i> Nixon	481
Group of <i>S. urios</i> Nixon	483
Group of <i>S. vulnificus</i> Wilkinson	483
APPENDIX	484
REFERENCES	486
INDEX OF THE <i>SPATHIUS</i> SPECIES AND SPECIES GROUPS LISTED IN THE TEXT	488

INTRODUCTION

The genus *Spathius* Nees, 1818 is the largest and also a very polymorphic genus in the subfamily Doryctinae. The highest diversity of this genus is observed in the Oriental-Australian region, where about 160 species from 38 species-groups were recognised by Nixon (1943). Only 27 species from 12 species-groups were described from the Afrotropical region (Nixon 1943, Granger 1949), but those data are very far from real number of *Spathius* species in the region. Thirty five species are recorded in the Palaearctic region (Fischer 1966a, Hedqvist 1976, Belokobylskij and Tobias 1986, Belokobylskij 1998), but information about the number of species of this genus in the southern part of Palaearctic is poor and to a considerable extent concerns only the fauna of China (Chao 1956, 1977, 1978, Chao and Chen 1995). A revision of Nearctic species of *Spathius* was prepared by Matthew (1970), who recorded 21 species in that region. The Neotropic region lacks species of this genus (except for some species introduced to its northern part); this genus is replaced there by very diverse vicariant genus *Notiospathius* Matthew et Marsh.

Spathius species are idiobiont ectoparasitoids of the larvae of numerous genera of different Coleoptera

families. They usually have a large number of hosts which are mostly the xylophagous beetle larvae of the families Scolytidae (24 genera recorded), Curculionidae (19 genera), Cerambycidae (13 genera), Anobiidae (12 genera), Bostrichidae and Buprestidae (8 genera each), sometimes also from Eucnemidae, Lyctidae, Ptinidae and others (Shenefelt and Marsh, 1976; Belokobylskij, 1996b). Representatives of this genus are also reported to parasitize lepidopteran larvae having usually a more-or-less wood or stem-boring habits (Sesiidae, Tineidae, Pyralidae and Tortricidae). *Spathius* species have also been recorded from hymenopteran larvae, especially of the xylophagous Xiphydriidae and less certainly the cecidiphagous Cynipidae.

Several species have been described from Europe, Asia and Africa (Madagascar) since the publication of the Nixon's (1943) monograph. Fischer (1966a) recorded 12 species for the West Palaearctics with description of one new species, *S. phymatodis* Fischer. At the same time he described another new species (*S. melanophila* Fischer) from Spain reared from the buprestid larva *Melanophila picta* Pallas (Fischer 1966b), and later (Fischer 1970) a new species (*S. radjabii* Fischer) from Iran. Then Hedqvist (1976) described 3 new species and gave a key for determination of species from Europe and the Canary Islands. One new species (*S. ussuriensis*

Tobias) was described from the Russian Far East (Tobias 1961). My study of the type material of *S. melanophilae* and *S. radjabii* as well as some additional material showed that both are synonyms of the rather widely distributed Western Palaearctic *S. polonicus* Niezabitowski (Belokobylskij 1989). *S. strandi* Fahringer was considered to be a distinct species by Fischer (1966a), who designated its lectotype (female, with the labels: "Frflld 1874", "*Spathius Strandii* n. sp.", "*Strandi* Fahr, det. Fahringer", "Type", "Lectotype, det Fischer"; NHMW). My comparison of this lectotype with a large material of *S. exarator* (Linnaeus) has shown the identity of both species (this synonymy was also mentioned by Hedqvist 1976). The investigation of the holotype of *S. depressus* Hedqvist (female, with the labels: "Upl., Trakvista, 25/3 1971, R. Baranowski", "*Agrilus viridis* L., *Magdalis c.*", "Holotypus *Spathius depressus* sp. n., K.-J. Hedqvist det., 1972", "464/83", "Rijksmuseum Stockholm") and numerous specimens of the other Palaearctic *Spathius* species distinctly showed that *S. depressus* Hedqvist, 1976 is a junior synonym of *S. rubidus* (Rossi, 1794) (**syn. nov.**) (see also comments after the redescription of *S. phymatodis* Fischer). A comparison of the paratype of *S. generosus* Wilkinson with a large material from the East Palaearctic showed that *S. ussuriensis* Tobias is a junior synonym of the first species which is widely distributed in Palaearctic (Belokobylskij 1998).

Four papers on the Chinese species of *Spathius* were published by Chao (1956, 1977, 1978) and Chao and Chen (1965), when 34 species from the species groups of *S. exarator* (Linnaeus), *S. sinicus* Chao, *S. fasciatus* Walker, *S. alipes* Wilkinson, *S. leucippus* Nixon, *S. testaceitarsis* Cameron, *S. rusticulus* Wilkinson, *S. cassidorus* Nixon, *S. labdacus* Nixon, *S. alternecoloratus* Chao, *S. imbecillus* (Enderlein) and *S. moderabilis* Wilkinson were described (see Appendix). Unfortunately, the types of only few species have been studied by the present author (some paratypes from Beijing and Budapest); most of the types of these species remain inaccessible for investigation in spite of several attempts to borrow these types from the collection of Chao in Fuzhou as well as the collection of the Institute of Zoology in Beijing. The study of paratypes of *S. jilinenis* Chao and *S. nungdaensis* Chao distinctly showed that both are synonyms of *S. generosus* Wilkinson (Belokobylskij 1998). The clear variation in the sculpture of the head and metasomal tergites, which is usual for the species from the *S. exarator*-group, allowed *S. sinicus* Chao as well as other species of the former *S. sinicus* Chao group to be regarded as members of the *S. exarator*-group. Only *S. xanthocephalus* Chao, 1977, *S. yunnanensis* Chao, 1977, *S. chunliuae* Chao, 1956 and *S. euthyradius* Chao, 1978 are included in the present revision, because the types of only these species were available. *S. aspersus* Chao, 1978 and *S. reticulatus* Chao et

Chen, 1965 were redescribed and figured based on the material from the Russian Far East (Belokobylskij 1989), but these species are not included in this paper because their types remains unavailable for study. The list of Chinese species and possible differences between some of these species on the basis of the Chao publications are presented in the Appendix below.

Several new species of *Spathius* from the Asian fauna were established by Belokobylskij (1989, 1996a, 1998). Because most of these species were described in Russian and/or with reduced morphological information (mostly in the key), they are redescribed here and compared with similar species in the Nixon's (1943) key. The descriptions of the Taiwanese species *S. convexitemporalis* Belokobylskij, 1996, *S. paracritolaus* Belokobylskij, 1996, *S. taiwanicus* Belokobylskij, 1996, *S. wusheensis* Belokobylskij, 1996, and the redescrptions of *S. annuliventris* (Enderlein, 1912) and *S. mimeticus* (Enderlein, 1912) are quite complete and in this paper only the positions of these species in Nixon's (1943) key are indicated. The Taiwanese *S. enderleini* (Strand, 1913) not included originally in Nixon's (1943) monograph was synonymized with *S. apicalis* Westwood, 1882 earlier (Belokobylskij 1996a).

Two species of *Spathius* were described by Motschoulsky (1863) from Ceylon (Sri Lanka): *S. albonervosus* Motschoulsky and *S. rufotestaceus* Motschoulsky. But *S. rufotestaceus* actually belongs to this genus (in the group of *S. fasciatus* Walker, see redescription below), *S. albonervosus* belongs to an unknown genus of the family Bethyliidae and has no relation with *Spathius*. The female holotype of the latter species (with the labels: red square, yellow rectangle, „Type“, „*Spathius albonervosus* Motsch., J.W. Ceyl. Mt. Pat“. [on yellow paper, handwriting by Motschoulsky] deposited in the collection of ZMMU) has been studied by the author. Unfortunately, the type of *S. pedunculatus* Cameron, 1910 (Java), which should be kept in the collection of the MNHU, has not been found, and this species is not included in the present revision. Recently one species *S. deccanensis* Kurhade et Nikam was described from India (Kurhade and Nikam 1994). This species was included by authors in the *S. vulnificus* Wilkinson group, but the study of original description and figures distinctly shows that *S. deccanensis* is from the *S. antennalis* Szépligeti (*alipes* Wilkinson) group. According to Nixon's (1943) key, this species is very similar to *S. melpomene* Nixon, 1943 (Philippines) because of possessing smooth vertex, striate frons, coarsely sculptured mesonotum and almost black propodeum. Comparison of the descriptions of these species allows to suggest that *S. deccanensis* Kurhade et Nikam, 1994 is a junior synonym of *S. melpomene* Nixon, 1943 (**syn. nov.**).

Four peculiar species of *Spathius* were described by Granger (1949) from Madagascar, but they represent

only a first small additional contribution to our knowledge of the diverse African fauna of this genus.

The terminology for wing venation follows that of Belokobylskij and Tobias (1998). The following abbreviations are used for morphology: POL postocellar line; OOL ocular-ocellar line; Od maximum diameter of lateral ocellus; for museums: AEIG – American Entomological Institute (Gainesville, USA); BMNH – The Natural History Museum (London, UK); BPBM – Bernice P. Bishop Museum (Honolulu, USA); FAHU – Laboratory of Systematic Entomology, Faculty of Agriculture, Hokkaido University (Sapporo, Japan); HNHM – Hungarian Natural History Museum (Budapest, Hungary); IZBC – Institute of Zoology (Beijing, China); KUFJ – Kyushu University (Fukuoka, Japan); MCZC – Museum of Comparative Zoology (Cambridge, USA); MHNG – Musée d'Histoire Naturelle (Geneve, Switzerland); MIZW – Museum i Institut Zoologii PAN (Warsaw, Poland); MNHN – Muséum National d'Histoire Naturelle (Paris, France); MNHU – Museum für Naturkunde der Humboldt-Universität (Berlin, Germany); NHMW – Naturhistorisches Museum (Wien, Austria); SMNH – Swedish Museum of Natural History (Stockholm, Sweden); USNM – United States National Museum (Washington, USA); ZISP – Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia); ZMMU – Zoological Museum of the Moscow University (Moscow, Russia).

SYSTEMATIC PART

Group of *Spathius antennalis* Szépligeti (*alipes* Wilkinson)

Spathius antennalis Szépligeti, 1905 (Figs 1–13)

Spathius antennalis Szépligeti, 1905: 40; Nixon 1943: 437; Shenefelt and Marsh 1976: 1388.

Material. Lectotype: female, “N.-Guinea, Biro 1899”, “Simbang, Huon Golf”, “Lectotypus ♀ *Spathius antennalis* Szépl. 1905, des. Papp J. 1969”, “Hym. Typ. No. 1583, Mus. Budapest” (HNHM).

Description. Female. Body length 3.9 mm; fore wing length 2.7 mm. Head not depressed, its width 1.8 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye about twice length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 0.8 times Od, 0.4 times OOL. Eye glabrous, 1.1 times as high as broad. Malar space height 0.3 times eye height and almost equal to basal width of mandible. Face width 1.1 times as long as eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large, transversely oval, its width 2.2 times distance from edge of depression to eye, 0.7 times width of face.

Occipital carina complete ventrally and fused with hypostomal carina, complete dorsally.

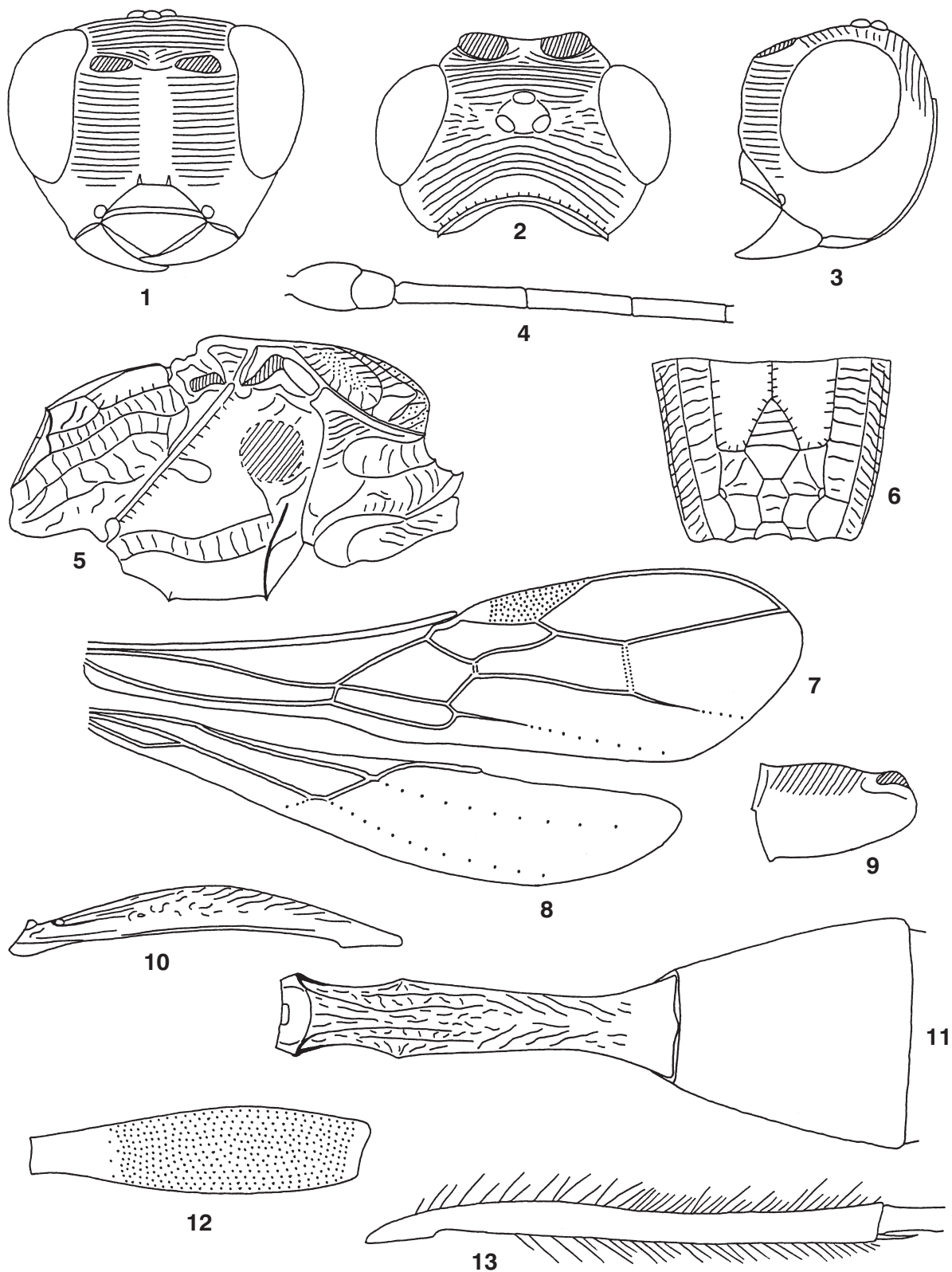
Antennae slender, filiform, more than 29-segmented (apical segments missing). First flagellar segment about 7 times as long as its apical width, 1.25 times as long as second segment. Subapical segments 3 times as long as wide.

Mesosoma. Length of mesosoma 1.7 times its height. Pronotal keel rather distinct, posterior branch widely fused with posterior margin of pronotum; anterior branch situated almost on middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression wide, deep, marginate, smooth, but with several anterior costae. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli deep, wide, complete, coarsely and sparsely crenulate. Prescutellar depression deep, wide, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum weakly convex. Sternauli deep, wide in anterior half, narrow posteriorly, S-shaped, sparsely crenulate, running along entire length of lower part of mesopleura. Postpectal carina distinct. Metapleural flange long and rather narrow. Propodeum with small lateral tubercles.

Wings. Fore wing 3.7 times as long as wide. Pterostigma 3.8 times as long as wide. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 3.5 times first abscissa and forming one line with it, 0.4 times third abscissa, 0.8 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3 times maximum width, 1.25 times length of narrow brachial cell. Recurrent vein 3 times second abscissa of medial vein. Nervulus interstitial, almost perpendicular to anal vein. Parallel vein not interstitial, arising almost from anterior 1/3 of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.8 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unsclerotized, straight, oblique, antefurcal.

Legs. Fore tibia with rather sparse spines arranged almost in one row. Hind coxa medium size (its length 1.7 times maximum width), with basoventral tooth. Hind femur 3.8 times as long as wide. Hind tibia without apical spines on outer margin, with 2 dense transverse rows of hairs on inner margin. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened in basal half; distinctly widened in apical 1/3 (dorsal view), with spiracular tubercles in basal 1/4. Length of petiole 3.8 times its apical width, 1.8 times length of propodeum; apical width 1.5 times width at level of spiracles. Second



Figures 1–13. *S. antennalis*: (1) head, frontal view, (2) head, dorsal view, (3) head, lateral view, (4) 5 basal segments of antenna, (5) mesosoma, lateral view, (6) propodeum, (7) fore wing, (8) hind wing, (9) hind coxa, (10) petiole, lateral view, (11) 3 basal segments of metasoma, dorsal view, (12) hind femur, (13) hind tibia.

tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost twice basal width of second tergite, 0.9 times their maximum width. Ovipositor weakly curved down. Ovipositor sheath 1.85 times as long as metasoma, 4 times as long as petiole, 3 times as long as mesosoma, almost as long as body, 1.5 times as long as fore wing.

Sculpture and pubescence. Vertex distinctly transversely striate, almost smooth posteriorly. Frons coarsely transversely striate. Face distinctly transversely striate, rather narrowly smooth medially. Temple smooth. Mesoscutum with dense coarse and long rugae along notauli and marginally, lateral lobe with narrow submedian granulate areas; median lobe striate medially, with fine granulation between striae. Scutellum very finely coriaceous, almost smooth, shining. Mesopleura smooth. Metapleura coarsely rugose-reticulate. Propodeum with distinctly marginate areas, basolateral areas smooth; areola long, rather narrow, sparsely transversely striate; petiolate area long and narrow, distinctly separated from areola; rest of propodeum sparsely or very sparsely transversely rugose-striate; basal carina short, 0.6 times as long as fork of areola. Hind coxa dorsally transversely striate (except smooth in posterior $\frac{1}{4}$), otherwise smooth. Hind femur finely striate dorsally, otherwise smooth. Petiole rugose-striate, more finely sculptured dorsally, smooth apically. Rest of tergites smooth. Mesoscutum with sparse long semi-erect white hairs along notauli and marginally. Hairs on dorsal surface of hind tibia with mixed long and short hairs, long hairs rather sparse, short hairs dense; long hairs almost erect, 0.9–1.0 times maximum width of tibia; short hairs absent in basal $\frac{1}{3}$ of tibia.

Colour. Head brownish yellow; mesonotum reddish yellow; promesosoma reddish-brown. Mesopleura, propodeum and petiole dark reddish brown to black. Rest of metasomal tergites reddish brown. Antenna yellow basally, dark brown at most part; at least 2 subapical segments white. Palpi pale yellow. Legs yellow, middle femur submedially, hind femur medially widely brownish, hind tarsus reddish-brown. Ovipositor sheath light brown, slightly darkened to apex, brown apically. Fore wing infusate. Pterostigma brown, paler in basal third.

Discussion. Study of the lectotype (see above) and paralectotype [(female, "N.-Guinea, Biro 1899", "Sattelberg, Huon Golf", "*Spathius antennalis* Sz., det. Szépligeti", "Paralectotypus, *Spathius antennalis* Szépl. 1905") designated by J. Papp and preserved in ZISP] of *S. antennalis* Szépligeti, and paratype of *S. alipes* ssp. *kokodaensis* Nixon, and also numerous specimens from different places and its description, showed distinctly than *S. antennalis* Szépligeti, 1905 is a senior synonym of *S. alipes* Wilkinson, 1931 (**syn. nov.**).

It is important to underline that the length of the basal propodeal carina is significantly variable in the examined material of this species and cannot be used

alone as a diagnostic character for separating it from other species of this group.

Distribution. New Guinea, Indonesia (Java, Borneo), Philippines.

Spathius chunliuae Chao, 1956
(Figs 14–26)

Spathius chunliuae Chao. 1956: 9; 1978: 174.

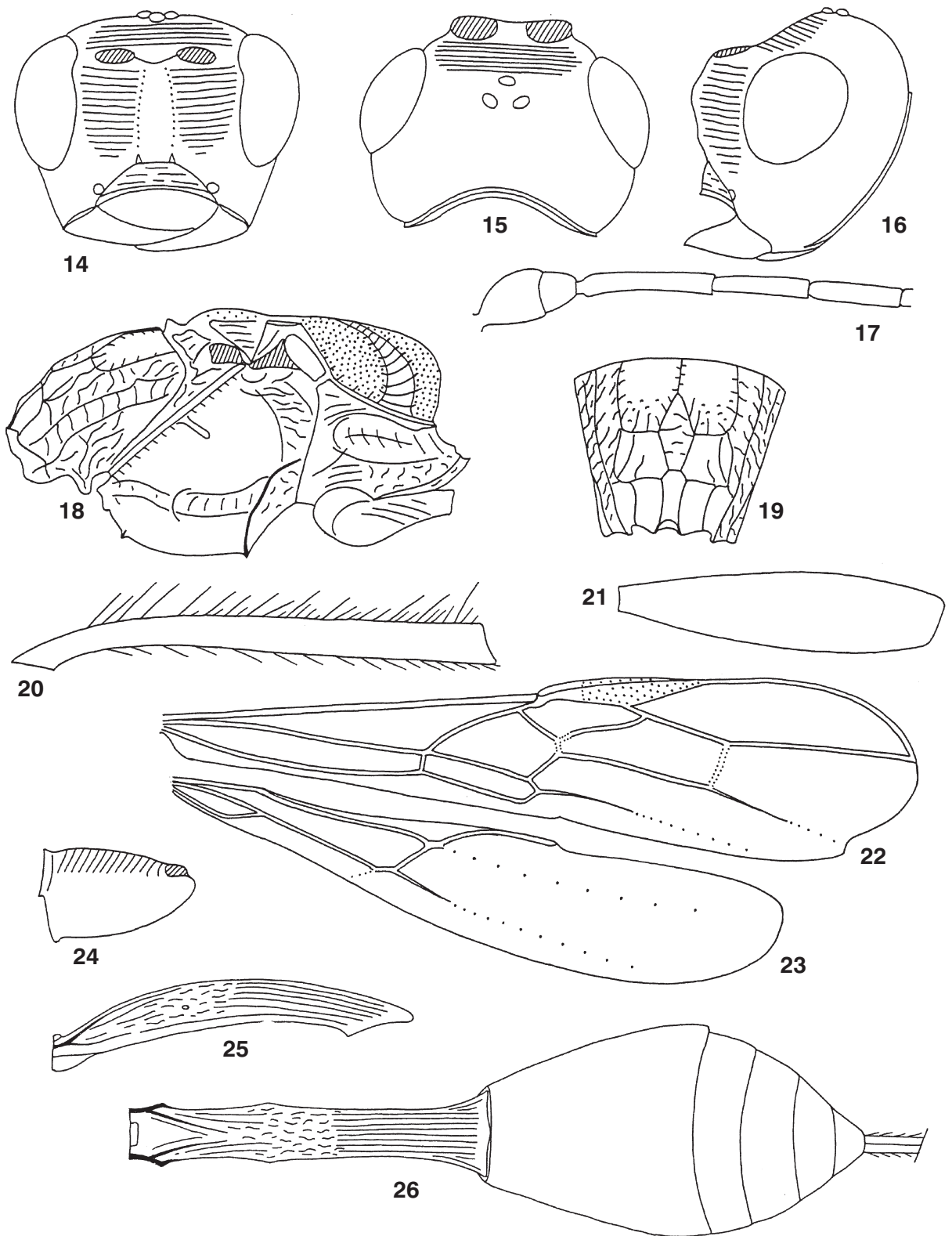
Material. Paratype: female, "Shaowu, Fukien, China, 3.IV.1944, H.F.Chao Coll.", "*Spathius chunliuae* Chao, sp. nov., Paratype" (yellow label) (HNHM).

Description. Female. Body length 2.9 mm; fore wing length 2.3 mm. Head not depressed, its width 1.6 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.5 times length of temple. Ocelli rather small, in triangle with base 1.15 times its sides; POL 0.8 times Od, 0.25 times OOL. Eye glabrous, 1.25 times as high as broad. Malar space height 0.3 times eye height and 0.7 times basal width of mandible. Face width 1.1 times as long as eye height and 1.15 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large, transversely oval, its width 2.2 times distance from edge of depression to eye, 0.8 times width of face. Occipital carina shortly absent ventrally and not fused with hypostomal carina near mandible, complete dorsally.

Antennae slender, filiform, more than 22-segmented (apical segments missing). Scape 1.5 times as long as maximum width. First flagellar segment about 7 times as long as its apical width, 1.4 times as long as second segment. Subapical segments 3.5 times as long as wide.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel rather distinct, posterior branch shortly fused with posterior margin of pronotum; anterior branch situated almost on middle of pronotum. Pronotum with distinct transverse carina in anterior $\frac{1}{5}$. Pronotal lateral depression wide, rather deep, marginate, sparsely crenulate. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli rather deep, complete, rather densely crenulate. Prescutellar depression deep, wide, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum weakly convex, with almost complete lateral carinae. Subalar depression shallow, wide, sparsely and finely rugulose-striate. Sternauli rather deep, strongly S-shaped, crenulate, running along almost entire length of lower part of mesopleura. Postpectal carina shortly present medially. Metanotum with small tooth. Metapleural flange long and rather narrow. Propodeum without lateral tubercles.

Wings. Fore wing 3.7 times as long as wide. Pterostigma 4.5 times as long as wide. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 4 times first abscis-



Figures 14–26. *S. chunliuae*: (14) head, frontal view, (15) head, dorsal view, (16) head, lateral view, (17) 5 basal segments of antenna, (18) mesosoma, lateral view, (19) propodeum, (20) hind tibia, (21) hind femur, (22) fore wing, (23) hind wing, (24) hind coxa, (25) petiole, lateral view, (26) metasoma, dorsal view.

sa and forming one line with it, 0.5 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.2 times maximum width, 1.4 times length of narrow brachial cell. Recurrent vein 2.5 times second abscissa of medial vein. Nervulus very shortly postfurcal, almost perpendicular to anal vein. Parallel vein not interstitial, arising almost from middle of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.2 times as long as wide. First costal abscissa 0.55 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unsclerotized, oblique, shortly antefurcal.

Legs. Fore tibia with rather sparse distinct spines arranged in one row. Hind coxa medium size (its length 1.6 times maximum width), with basoventral tooth. Hind femur elongate oval, 4.0 times as long as wide. Hind tibia without apical spines. Hind tarsus as long as hind tibia. Hind basitarsus 0.65 times as long as second-fifth segments combined; second tarsal segment 0.55 times as long as basitarsus, 1.4 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, slightly and regularly curved dorsally, thickened submedially; distinctly widened in apical $\frac{1}{5}$ (dorsal view), with small spiracular tubercles in basal $\frac{1}{4}$. Length of petiole 3.8 times its apical width, twice length of propodeum; apical width 1.6 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost twice basal width of second tergite, equal to their maximum width. Ovipositor curved down. Ovipositor sheath 2.2 times as long as metasoma, 3.3 times as long as mesosoma, 1.3 times as long as body, 1.5 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons transversely striate. Face transversely striate, narrowly smooth medially. Mesoscutum densely granulate, with short rugae along notauli, with 2 weakly convergent carinae and rugulosity between carinae in medioposterior $\frac{1}{5}$. Scutellum finely coriaceous. Mesopleura smooth at most part. Metapleura finely coriaceous in anterior $\frac{1}{5}$, rugulose-reticulate with coarse and sparse rugae in posterior $\frac{2}{5}$. Propodeum finely or very finely rugulose, partly smooth, with distinctly marginate areas, areola narrow, petiolate area long and distinctly separated from areola; basal carina 0.85 times as long as fork of areola. Hind coxa densely transversely striate dorsally, smooth laterally. Hind femur smooth. Petiole finely rugulose-striate in basal $\frac{2}{5}$, distinctly striate in apical $\frac{1}{5}$. Rest of tergites smooth. Mesoscutum with sparse, rather long, semi-erect hairs along notauli and marginally. Hairs on dorsal surface of hind tibia with semi-erect mixed long and rather short hairs, long hairs rather sparse in basal $\frac{1}{3}$, short hairs dense in apical $\frac{2}{5}$; length of hairs 0.5–1.0 times maximum width of tibia.

Colour. Head brownish yellow, only yellow below. Mesosoma and metasoma light reddish-yellow, metasoma behind petiole reddish brown. Antenna light reddish brown to reddish brown apically, 2 basal segments brownish yellow. Palpi pale yellow. Legs yellow, fifth segment of all tarsi brownish. Ovipositor sheath light reddish brown, darkened to apex. Fore wing faintly infuscate. Pterostigma brown, pale basally.

Discussion. *S. chunliuae* is in the *S. antennalis* Szépligeti group and is similar to *S. medon* Nixon (Nixon 1943: couplet 11, page 276). The differences between these species are indicated in the following key:

- 11a. Propodeum and mesopleura light reddish brown. Vertex entirely smooth. Mesoscutum with fine rugae on lateral and median lobes. Pronotal keel distinct *S. chunliuae* Chao
 –. Propodeum and mesopleura almost black. Vertex distinctly and entirely striate. Mesoscutum with coarse and distinct rugae on lateral and median lobes. Pronotal keel very fine *S. medon* Nixon

Distribution. China (Fujian).

Spathius euthyradius Chao, 1978

(Figs 27–38)

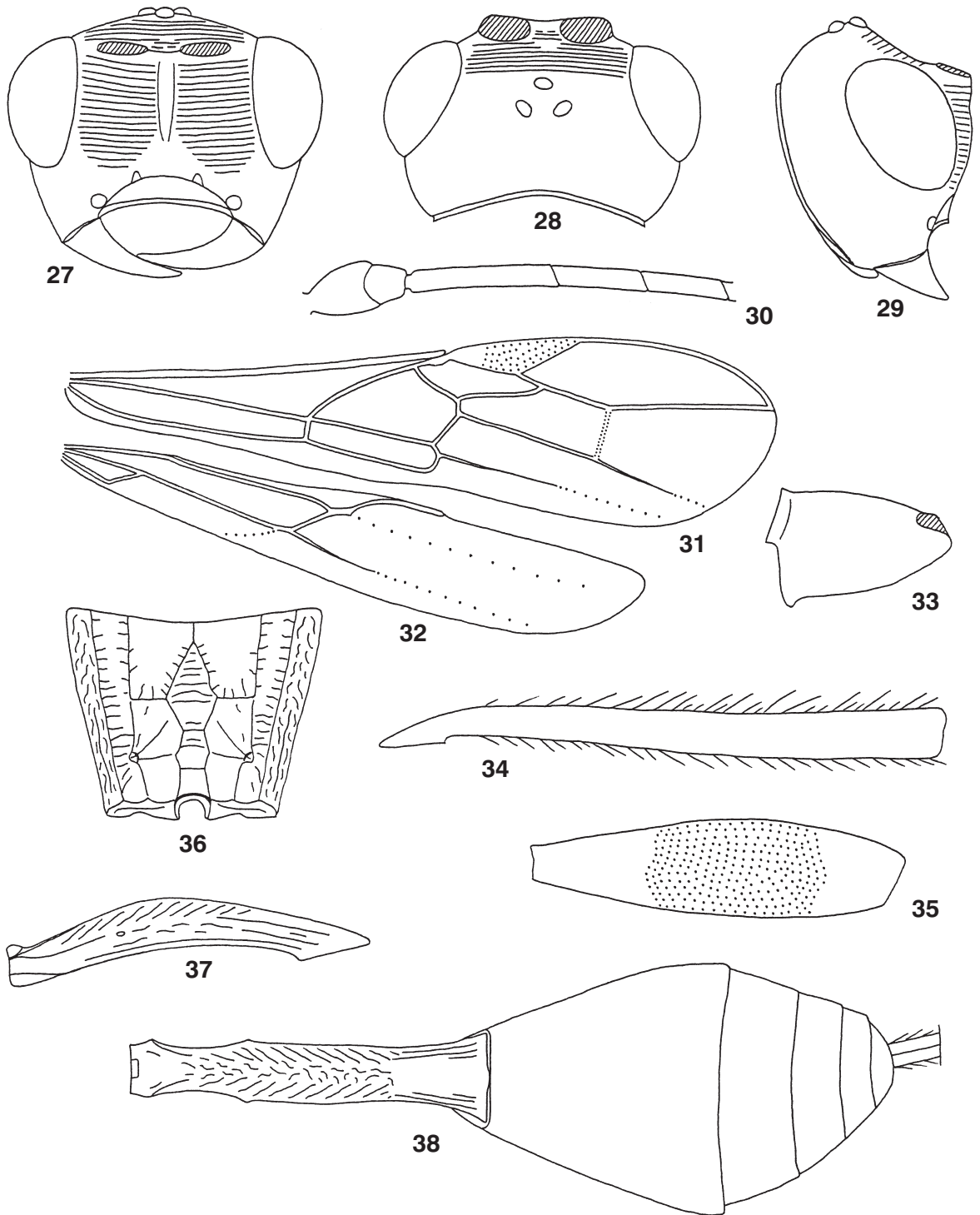
Spathius euthyradius Chao, 1978: 174.

Material. Paratype: female, “6 hieroglyphs, 340, 2 hieroglyphs, 5 hieroglyphs”, “1960.IV.24, 6 hieroglyphs”, “Paratype”, “*Spathius euthyradius* Chao, 5 hieroglyphs”, “19” (IZBC).

Description. Female. Body length 5.0 mm; fore wing length 3.4 mm. Head not depressed, its width 1.8 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli medium sized, in almost equilateral triangle; POL almost equal to Od, 0.33 times OOL. Eye glabrous, 1.25 times as high as broad. Malar space height 0.35 times eye height and 0.9 times basal width of mandible. Face width 1.1 times as long as eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large, transversely oval, its width twice distance from edge of depression to eye. Occipital carina complete and fused with hypostomal carina near mandible, complete dorsally. Hypostomal flange wide. Vertex weakly convex.

Antennae slender, filiform, more than 21-segmented (apical segments missing). First flagellar segment 6.5 times as long as its apical width, 1.5 times as long as second segment.

Mesosoma. Length of mesosoma 1.7 times its height. Pronotal keel distinct, its posterior branch not fused with posterior margin of pronotum. Pronotal lateral depression wide, rather deep, sparsely crenulate. Mesoscutum highly and almost perpendicularly raised



Figures 27–38. *S. euthyradius*: (27) head, frontal view, (28) head, dorsal view, (29) head, lateral view, (30) 5 basal segments of antenna, (31) fore wing, (32) hind wing, (33) hind coxa, (34) hind tibia, (35) hind femur, (36) propodeum, (37) petiole, lateral view, (38) metasoma, dorsal view.

above pronotum. Notauli deep, complete, rather densely crenulate. Prescutellar depression deep, rather wide, with sparse and distinct carinae, smooth, 0.35 times as long as almost scutellum. Scutellum flat. Subalar depression shallow, narrow, rugulose-striate. Sternauli deep, crenulate, running along anterior 3/4 of lower part of mesopleura. Postpectal carina absent. Propodeum with short lateral tubercles.

Wings. Fore wing 4.2 times as long as wide. Radial vein arising nearly middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 3 times first abscissa and forming one line with it, 0.45 times third abscissa, 0.85 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length about 3 times maximum width, 1.1 times length of narrow brachial cell. Nervulus interstitial, almost perpendicular to anal vein. Parallel vein not interstitial, arising from anterior 1/5 of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing almost 6 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.45 times second abscissa. Recurrent vein unsclerotized, oblique, shortly antefurcal.

Legs. Hind coxa medium size (its length 1.6 times maximum width), with basoventral tooth. Hind femur elongate-oval, 4 times as long as wide. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.6 times as long as basitarsus, 1.6 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened submedially; widened in apical 1/6 (dorsal view), with small spiracular tubercles in basal 1/3. Length of petiole almost 4 times its apical width, 2.2 times length of propodeum; apical width 1.5 times width at level of spiracles. Second tergite without separate laterotergites. Second suture absent. Median length of second and third tergites combined 2.3 times basal width of second tergite, almost equal to their maximum width. Ovipositor sheath 4.5 times as long as petiole, 1.2 times as long as body, 1.7 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons and face transversely striate, face narrowly smooth medially. Mesoscutum densely granulate, with long rugae along notauli and laterally covering most part of lobes, with 2 weakly convergent and almost straight carinae medioposteriorly. Scutellum finely granulate. Mesopleura smooth at most part. Propodeum smooth on basolateral areas, sparsely rugose on rest part, with distinctly marginate areas, areola rather wide and short, petiolate area long and distinctly separated from areola; basal carina 0.35 times as long as fork of areola. Hind coxa and femur smooth. Petiole rugose-striate at most part, smooth on medioapical 1/4. Rest of tergites smooth. Mesoscutum with sparse, rather long, semi-erect hairs

along notauli and marginally. Hairs on dorsal surface of hind tibia with semi-erect, rather short and dense hairs, their length 0.5–0.7 times maximum width of tibia.

Colour. Head yellowish brown. Mesosoma reddish-yellow. Metasoma light reddish brown with dark spots dorsally. Antenna light reddish brown, darkened towards apex. Palpi pale yellow. Legs yellowish brown, hind femur brown medially. Ovipositor sheath brown. Fore wing faintly infuscate. Pterostigma brown, pale in basal 1/3.

Discussion. *S. euthyradius* Chao is in the *S. anten-nalis* Szépligeti group and is similar to *S. melpomene* Nixon (Nixon 1943: couplet 9, page 276). The differences between these species are indicated in the following key:

- 9a. Basal carina of propodeum 0.35 times as long as fork of areola. Lateral depression of pronotum sparsely and coarsely crenulate. Mesoscutum with less strong and shorter rugae on lateral and median lobes and densely granulate submedially. Scutellum without rugae. Sternauli densely crenulate *S. euthyradius* Chao
- Basal carina of propodeum almost as long as fork of areola. Lateral depression of pronotum smooth. Mesoscutum with strong and long rugae on lateral and median lobes and very finely granulate submedially. Scutellum with coarse and more or less transverse rugae. Sternauli almost smooth *S. melpomene* Nixon

S. euthyradius Chao is similar also to *S. medon* Nixon (Nixon 1943: couplet 11, page 276). The differences between these species are indicated below:

- 11a. Propodeum and metapleura light reddish brown. Vertex entirely smooth. Pronotal keel distinct. Lateral lobes of mesoscutum densely granulate submedially *S. euthyradius* Chao
- Propodeum and metapleura black or dark reddish brown. Vertex finely, but distinctly transversely striate. Pronotal keel extremely weak. Lateral lobes of mesoscutum almost smooth submedially *S. medon* Nixon

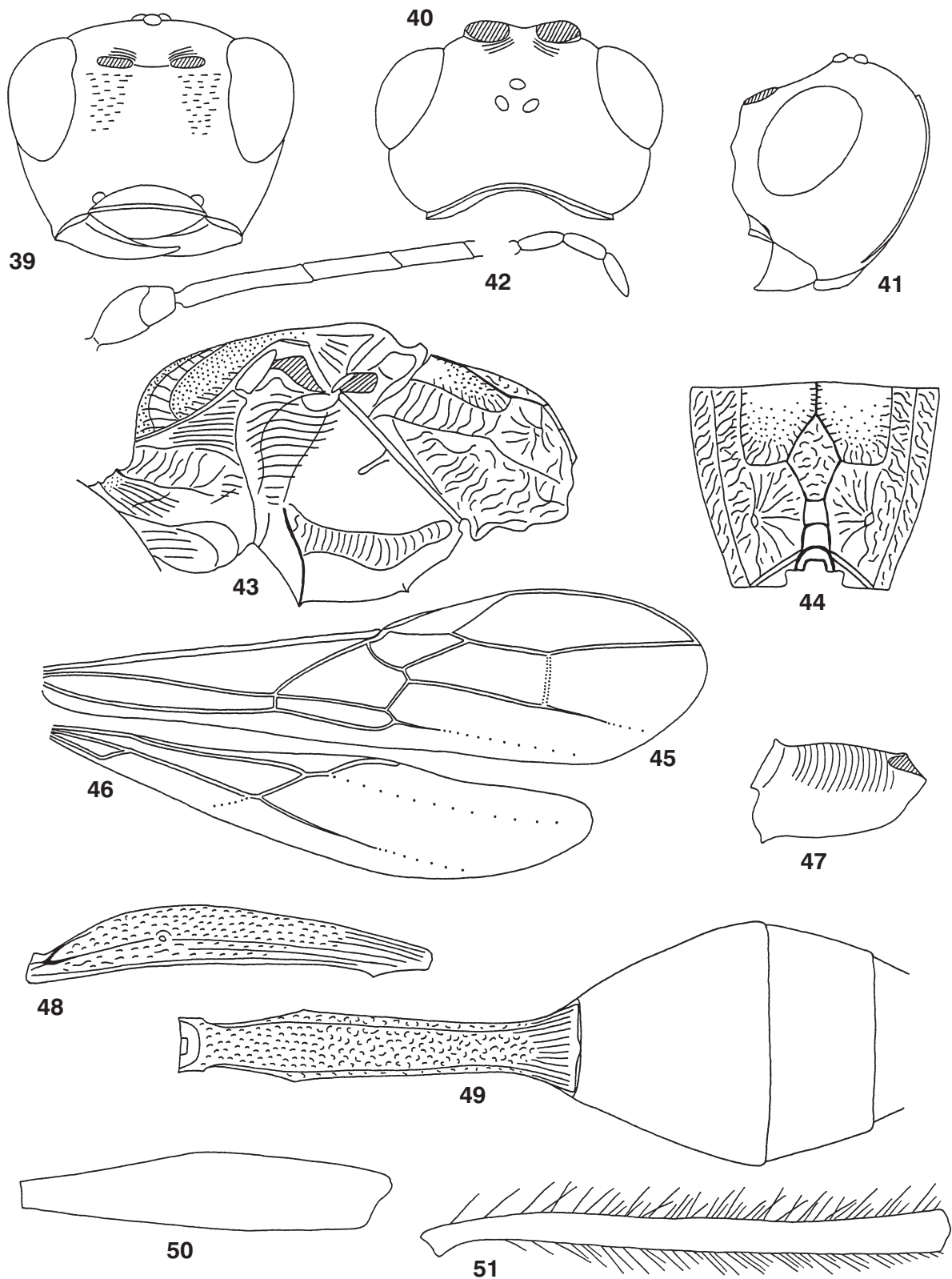
The differences between the very similar Chinese *S. euthyradius* Chao and *S. chunliuae* Chao (according to Chao 1978: 174) are as follows:

- 6. Rugae of mesoscutum widely distributed on median and lateral lobes, with narrow submedian areas only granulate *S. euthyradius* Chao
- Rugae of mesoscutum shortly distributed on median and lateral lobes, with wide submedian areas only granulate *S. chunliuae* Chao

Distribution. China (Sichuan, Guangdong).

Spathius flavofulvus Nixon, 1943
(Figs 39–51)

Spathius testaceus Szépligeti, 1913: 600 (not *S. testaceus* Szépligeti 1902).
Spathius flavofulvus Nixon 1943: 438 (nomen novum for *S. testaceus* Szépligeti 1913); Shenefelt and Marsh 1976: 1403.



Figures 39–51. *S. flavofulvus*: (39) head, frontal view, (40) head, dorsal view, (41) head, lateral view, (42) basal and apical segments of antenna, (43) mesosoma, lateral view, (44) propodeum, (45) fore wing, (46) hind wing, (47) hind coxa, (48) petiole, lateral view, (49) 4 basal segments of metasoma, dorsal view, (50) hind femur, (51) hind tibia.

Material. Lectotype: female, "Africa or., Katona", "Moschi, 1905, VII", "Lectotypus ♀ *Spathius testaceus* Szep. 1913" (below: "des. Papp J. 1967"), "Hym. Typ. No 1580, Mus. Budapest", "*Spathius testaceus* m." (handwriting by Szépliget), "*Spathius flavofulvus* Nix., det Papp J., 1983", "*Spathius testaceus* Szep. 1913 LT ♀" (HNHM).

Description. Female. Body length 5.1 mm; fore wing length 3.9 mm. Head not depressed, its width 1.7 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.4 times length of temple. Ocelli rather small, in almost equilateral triangle; POL almost equal to Od, 0.3 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.5 times eye height and almost equal to basal width of mandible. Face width 1.3 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large and transversely oval, its width twice distance from edge of depression to eye, 0.7 times width of face. Occipital carina complete near mandible and fused with hypostomal carina, complete dorsally. Hypostomal flange rather wide and distinct.

Antennae slender, weakly setiform, 49-segmented, 1.5 times as long as body. First flagellar segment 7 times as long as its apical width, 1.5 times as long as second segment. Penultimate segment almost 3 times as long as wide, 0.3 times as long as first segment, 0.9 times as long as apical segment; the latter with short spine apically.

Mesosoma. Length of mesosoma 1.7 times its height. Pronotal keel distinct, with single branch situated near middle of pronotum. Pronotum subanteriorly with distinct transverse carina, which is broken medially and situated more closely to pronotal keel. Pronotal lateral depression deep, wide, marginate, densely crenulate. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli rather deep (especially anteriorly), wide, complete, coarsely and densely crenulate. Prescutellar depression deep, wide, with 3 high carinae, smooth between carinae, 0.4 times as long as scutellum. Scutellum weakly convex. Subalar depression shallow, wide, rugose-striate. Sternauli rather shallow, S-shaped, rather wide, densely crenulate, running along entire length of lower part of mesopleura. Postpectal carina short and present medially only. Metapleural flange rather long and wide. Propodeum without lateral tubercles.

Wings. Fore wing 3.8 times as long as wide. Pterostigma about 5 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 4.5 times first abscissa and forming one line with it, 0.6 times third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell weakly widened distally, its length 2.8 times maximum width, 1.2 times length of brachial cell. Nervulus perpendicular to anal vein and interstitial to basal vein. Parallel vein not interstitial, arising almost

from middle of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.2 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unsclerotized, long, weakly curved, weakly antefurcal.

Legs. Fore tibia with several sparse strong spines arranged in one line. Hind coxa rather large (its length 1.8 times maximum width), with distinct basoventral tooth and tooth. Hind femur 4.7 times as long as wide. Hind tibia without spines in outer margin, with 2 rows of dense silver hairs on inner side apically. Hind tarsus 1.1 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.6 times as long as basitarsus, 1.7 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, distinctly and regularly curved dorsally, distinctly thickened in basal half; distinctly widened in basal $\frac{1}{3}$ and apical $\frac{1}{6}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 4.7 times its apical width, 2.2 times length of propodeum; apical width 1.3 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 2.3 times basal width of second tergite, 0.9 times their maximum width. Ovipositor curved down. Ovipositor sheath 2.3 times as long as metasoma, 5 times as long as petiole, 3.8 times as long as mesosoma, 1.7 times as long as fore wing, 1.25 times as long as body.

Sculpture and pubescence. Vertex smooth. Frons smooth, finely striate near antennal sockets. Face rather finely transversely striate in upper $\frac{1}{3}$, almost entirely smooth in lower $\frac{2}{3}$. Temple smooth. Mesoscutum densely and rather finely striate, with short rugae near notauli, coarsely rugose-reticulate on wide area medio-posteriorly. Scutellum almost smooth. Mesopleura widely smooth. Metapleura rugose-reticulate. Propodeum with distinctly marginate areas; basolateral area very finely coriaceous, almost smooth anteriorly, rugulose posteriorly; areola long and wide; petiolate area distinctly separated from areola, divided medially additional transverse stria; rest of propodeum rugose-reticulate; basal carina short, 0.6 times as long as fork of areola. Hind coxa distinctly striate in dorsal half, smooth in ventral half. Hind femur smooth. Petiole densely rugulose-reticulate, undulately striate laterally, distinctly striate in apical $\frac{1}{6}$. Rest of tergites smooth. Mesonotum with rather long semi-erect hairs along notauli and marginally. Hairs on dorsal surface of hind tibia dense, almost erect, long and short (in apical $\frac{2}{3}$), length of long hairs almost equal to maximum width of tibia.

Colour. Body reddish-yellow, mesosoma faintly darker. Antennae reddish-yellow in basal $\frac{1}{3}$, then dark brown, 14 subapical segments yellow, 4 apical segments dark brown. Palpi yellow. Legs reddish yellow, base of all

tibiae paler, hind tarsi brownish-yellow, partly faintly darker. Ovipositor sheath dark brown basally and apically, brownish yellow at wide median part. Fore wing faintly infuscate. Pterostigma yellow.

Discussion. Comparison of the lectotype of *S. flavofulvus* Nixon, 1943 with the description (Brues 1924) and redescription (Nixon 1943) of *S. laeviceps* Brues and with a specimen determined by G.E.J. Nixon as *S. laeviceps*, showed distinctly that *S. flavofulvus* Nixon, 1943 is a junior synonym of *S. laeviceps* Brues, 1924 (**syn. nov.**).

Distribution. South Africa, Tanzania, Madagascar.

Spathius fuscipennis Ashmead, 1905

(Figs 52–61)

Spathius fuscipennis Ashmead, 1905: 119; Nixon 1943: 439; Shenefelt and Marsh 1976: 1404.

Material. Lectotype (designated here for stability of nomenclature): male, "Manila, PI", "Robt Brown Collector" "Type ♂ No 8457 U.S.N.M." (red), "*Spathius fuscipennis* Ashm. ♂" (handwriting by Ashmead) (USNM).

Description. Male. Body length 3.4 mm; fore wing length 2.5 mm. Head not depressed, its width 1.65 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye twice length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL almost equal to Od, 0.4 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.3 times eye height and 0.7 times basal width of mandible. Face width 1.1 times as long as eye height and 1.1 times as long as height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large and transverse, its width about 2.5 times distance from edge of depression to eye, 0.7 times width of face. Occipital carina fused near mandible with hypostomal carina, complete dorsally.

Antennae slender, filiform, more than 38-segmented (apical segments missing). Scape 1.7 times as long as wide. First flagellar segment 7 times as long as its apical width, 1.4 times as long as second segment. Subapical segments 4 times as long as wide.

Mesosoma. Length of mesosoma 1.6 times its height. Pronotal keel distinct, its posterior branch rather widely fused with posterior margin of pronotum, strong anterior branch situated near middle of pronotum. Pronotal lateral depression wide, distinctly marginate, finely crenulate. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli deep, complete, rather wide, crenulate. Prescutellar depression long, deep, with 3 carinae, smooth, half as long as scutellum. Scutellum weakly convex. Subalar depression shallow, rather wide, striate. Sternauli rather deep, wide, curved, shallow posteriorly, sparsely and coarsely crenulate, running along entire length of lower part of mesopleura. Metanotum with small obtuse tooth. Metapleural flange

distinct and rather narrow. Propodeum with very small lateral tubercles.

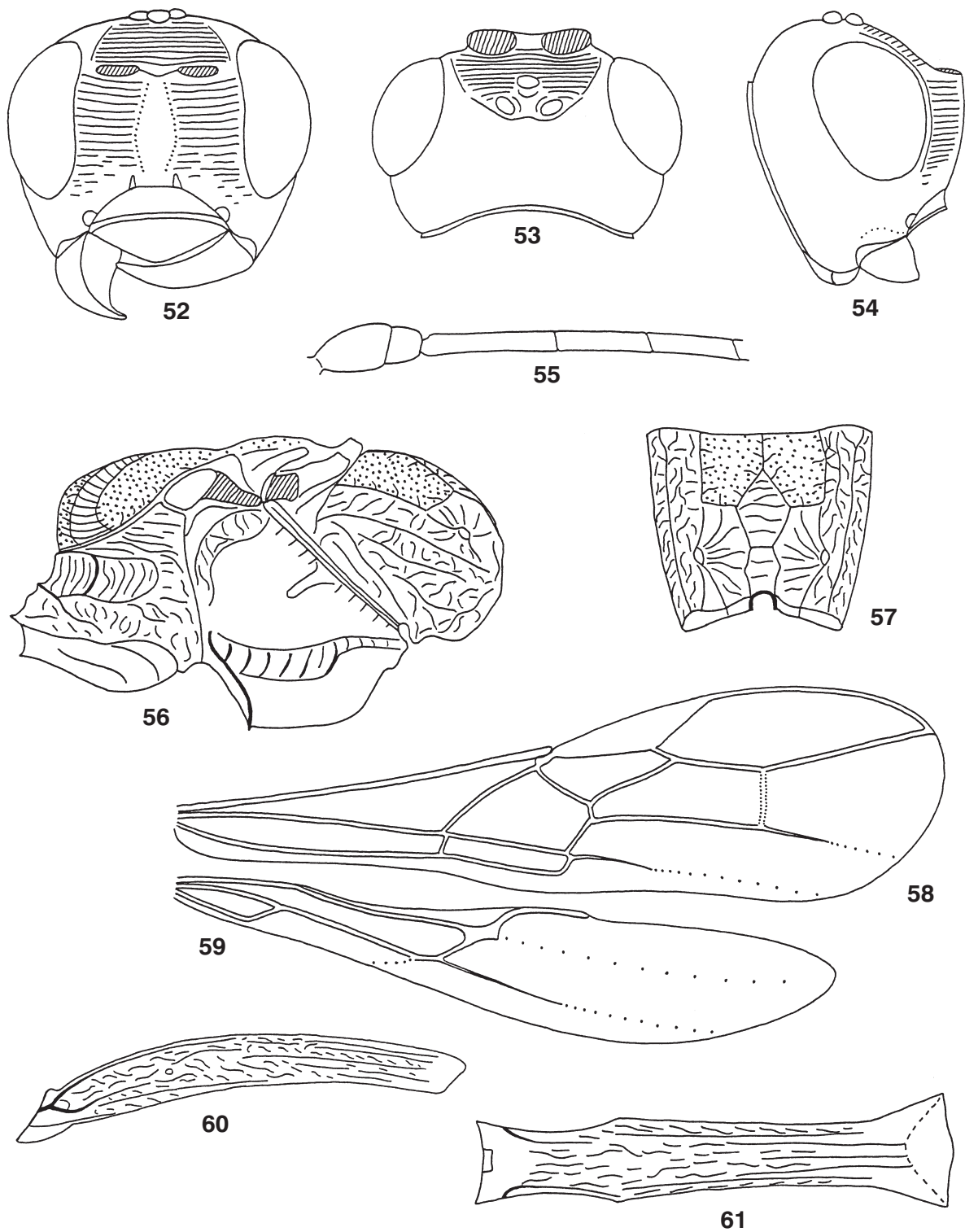
Wings. Fore wing 3.7 times as long as wide. Radial vein arising slightly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.8 times first abscissa and forming almost straight line with it, 0.5 times third abscissa, almost as long as first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.2 times maximum width, 1.4 times length of brachial cell. Recurrent vein 2.5 times second abscissa of medial vein. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.2 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.6 times second abscissa. Fourth costal abscissa weakly widened (similar to stigma-like enlargement). First abscissa of mediocubital vein 0.65 times second abscissa. Recurrent vein curved and distinctly antefurcal.

Legs. Fore tibia in distal half with rather dense numerous small spines arranged in rather wide stripe. Middle and hind legs missing.

Metasoma. Petiole (lateral view) weakly curved ventrally, slightly and regularly curved dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{2}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 3.8 times its apical width, almost twice length of propodeum; apical width 1.45 times width at level of spiracles. Second tergite without separate laterotergites. Second suture absent. Median length of second and third tergites combined twice basal width of second tergite, almost equal to their maximum width.

Sculpture and pubescence. Vertex smooth, very finely aciculate near ocelli. Frons coarsely rugose-striate. Face densely striate, narrowly smooth at vertical median part. Temple smooth. Mesoscutum densely granulate, with coarse and rather long rugae near notauli on median and lateral lobes and marginally; granulation of lateral lobes situated on rather narrow median area. Scutellum very finely granulate. Mesopleura smooth. Metapleura rugose, very finely reticulate in upper $\frac{1}{2}$. Propodeum finely and sparsely rugulose, smooth in large parts, with distinct and marginate areas, basolateral areas almost smooth at most part; areola small and pentagonal, petiolate area long and narrow; basal carina long, almost as long as fork of areola. Petiole rugose, striate in distal $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with sparse long yellow semi-erect or erect hairs situated widely along notauli and narrowly marginally. Antennal hairs long, rather dense, semi-erect, about as long as width of segments.

Colour. Head and mesoscutum reddish yellow, metasoma reddish brown, rest part of mesosoma and petiole almost black, face brownish. Two basal segments of



Figures 52–61. *S. fuscipennis*: (52) head, frontal view, (53) head, dorsal view, (54) head, lateral view, (55) 5 basal segments of antenna, (56) mesosoma, lateral view, (57) propodeum, (58) fore wing, (59) hind wing, (60) petiole, lateral view, (61) petiole, dorsal view.

antenna yellow, rest segments brown to dark brown. Palpi yellow. Fore legs yellow. Fore wing faintly infuscate. Pterostigma light brown.

Discussion. *Spathius fuscipennis* Ashmead, 1905 is a senior synonym of *S. enippe* Nixon, 1943 (**syn. nov.**). It was possible to decide that after comparing the lectotype of *S. fuscipennis* (male in poor condition) and Nixon's description of *S. enippe* from the Philippines. There are no distinct differences between these species, except the longer hairs of the antenna in *S. fuscipennis* (but it is quite possibly only a male character!). The differences between *S. antennalis* (= *alipes*) and *S. fuscipennis* (= *enippe*) are very small. It is possible also that the main diagnostic characters of these species (including coloration of the pterostigma) are within the range of the morphological variation of *S. antennalis*, which can be seen after study of the additional material from different places of the Oriental region.

This species was also recorded from Japan (Shenefelt and Marsh, 1976), but this record is quite possibly erroneous.

Distribution. Philippines.

Spathius radialis Szépligeti, 1908

(Figs 62–74)

Spathius radialis Szépligeti, 1908: 221; Nixon 1943: 443; Shenefelt and Marsh 1976: 1414.

Material. Holotype: female, "E. Jacobson, Semarang, Java, 1905", "Indonesia", "Holotypus ♀ *Spathius radialis* Szepl. 1908" (below: "des. Papp. J, 1969"), "Hym. Typ. No. 1591, Mus. Budapest", "*Spathius radialis* m." (handwriting by Szépligeti) (HNHM).

Description. Female. Body length 3.3 mm; fore wing length 2.4 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye about twice length of temple. Ocelli medium sized, in almost equilateral triangle; POL almost equal to Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.3 times eye height and 0.7 times basal width of mandible. Face width 0.9 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression large and transversely oval, its width 1.6 times distance from edge of depression to eye, 0.6 times width of face. Occipital carina fused below with hypostomal carina, complete dorsally.

Antennae missing, present only scape and pedicel.

Mesosoma. Length of mesosoma 1.7 times its height. Pronotal keel distinct, posterior branch widely fused medially with posterior margin of pronotum; anterior branch situated almost on middle of pronotum. Pronotum in anterior ¼ with high transverse carine. Pronotal lateral depression wide, deep, marginate, sparsely crenulate anteriorly, with median costa. Mesoscutum highly and

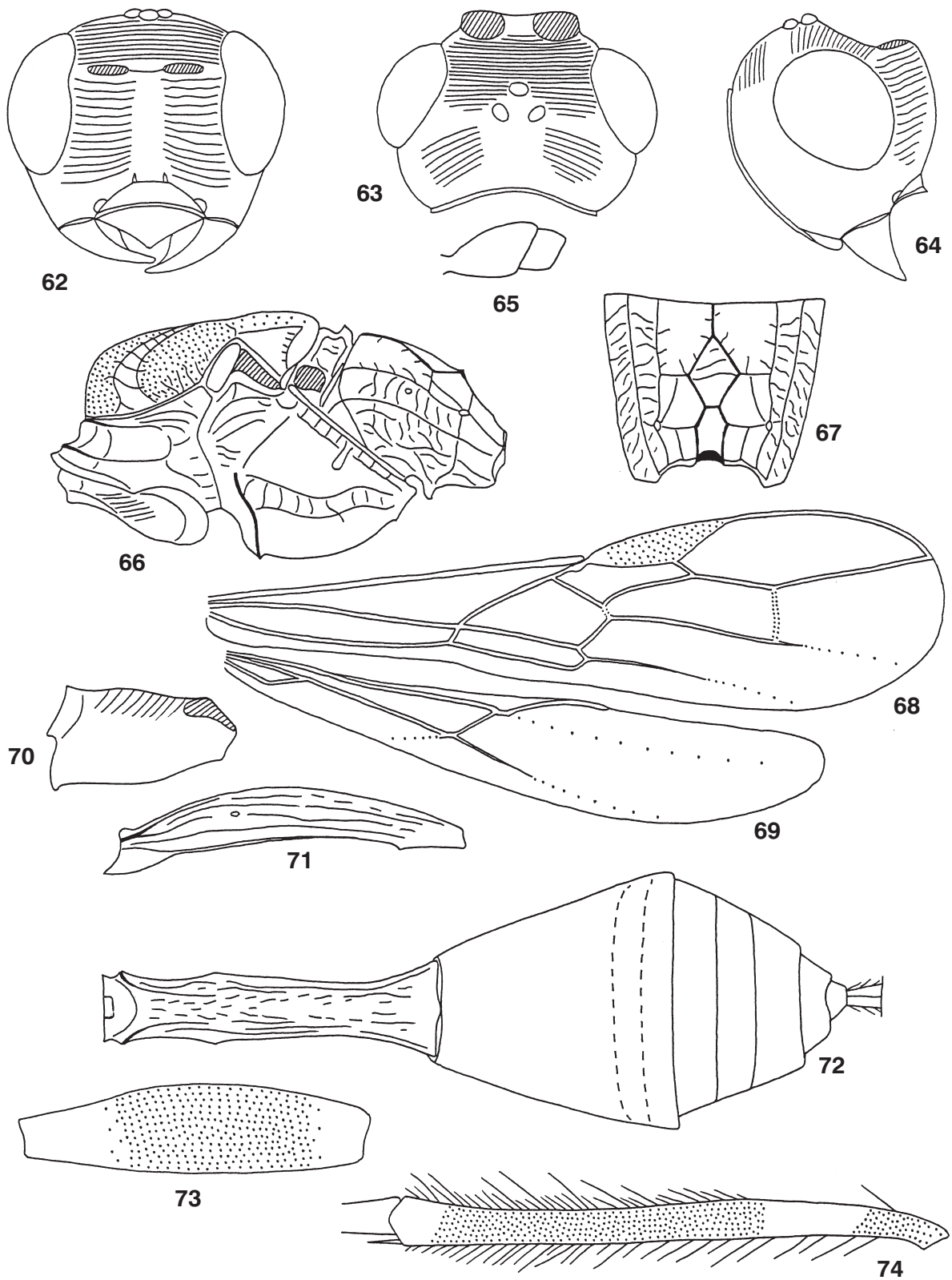
almost perpendicularly raised above pronotum. Notauli rather deep, complete, crenulate. Prescutellar depression deep, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum weakly convex. Subalar depression shallow, rather narrow, coarsely rugose-striate. Sternauli deep, weakly S-shaped, rather wide, crenulate (but sparsely crenulate in posterior half), running along entire length of lower part of mesopleura. Metanotum with short obtuse tooth. Metapleural flange long and narrow. Propodeum with very small lateral tooth.

Wings. Fore wing 3.6 times as long as wide. Pterostigma 3.8 times as long as wide. Radial vein arising behind middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa almost 4 times first abscissa and forming almost one line with it, 0.5 times third abscissa, 0.85 times weakly curved first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3 times maximum width, 1.3 times length of narrow brachial cell. Recurrent vein 3 times second abscissa of medial vein. Nervulus distinctly oblique towards base of wing, interstitial. Parallel vein not interstitial, arising from middle of distal vein of brachial cell. Mediocubital vein very weakly curved to anal vein in distal half. Hind wing 6 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein almost 0.5 times second abscissa. Recurrent vein unsclerotized, curved, antefurcal.

Legs. Fore tibia with sparse spines arranged almost in one row. Hind coxa medium size (its length 1.7 times maximum width), with distinct basoventral tooth and corner. Hind femur 3.8 times as long as wide. Hind tibia without apical spines. Hind tarsus 1.1 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.6 times as long as basitarsus, 1.4 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, weakly thickened submedially; distinctly widened in apical ⅓ (dorsal view), with spiracular tubercles in basal third. Length of petiole 3.8 times its apical width, 2.2 times length of propodeum; apical width 1.6 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost twice basal width of second tergite, about 0.9 times their maximum width. Ovipositor weakly curved down. Ovipositor sheath 2.2 times as long as metasoma, 4.7 times as long as petiole, 3.5 times as long as mesosoma, 1.15 times as long as body, and 1.6 times as long as fore wing.

Sculpture and pubescence. Vertex very finely striate, smooth medially and laterally. Frons densely transversely striate. Face almost entirely transversely striate. Temple smooth. Mesoscutum densely granulate, with sparse and distinct rugae along notauli and later-



Figures 62–74. *S. radialis*: (62) head, frontal view, (63) head, dorsal view, (64) head, lateral view, (65) 2 basal segments of antenna, (66) mesosoma, lateral view, (67) propodeum, (68) fore wing, (69) hind wing, (70) hind coxa, (71) petiole, lateral view, (72) metasoma, dorsal view, (73) hind femur, (74) hind tibia.

ally. Scutellum finely granulate. Mesopleura smooth. Metapleura densely rugose-reticulate. Propodeum smooth almost entirely, with short rugulosity along carinae partly, with distinctly marginate areas, areola rather short and narrow, petiolate area rather long and distinctly separate from areola; basal carina 0.7 times as long as fork of areola. Hind coxa striate dorsally, smooth at most part. Hind femur smooth. Petiole striate, very finely sculptured medially in basal $\frac{2}{3}$, smooth apically. Rest of tergites smooth. Mesoscutum with very sparse semi-erect white hairs along notauli and marginally. Hairs on dorsal surface of hind tibia with mixed short and long semi-erect and rather dense hairs, hairs almost absent in basal $\frac{1}{3}$; length of long hairs 0.9–1.5 times maximum width of tibia.

Colour. Head brownish yellow. Mesonotum and metasoma behind petiole reddish yellow, rest part of mesosoma brownish red, metapleura, propodeum and petiole dark reddish brown. Two basal segments of antenna brownish yellow. Palpi pale yellow. Legs yellow, hind femur widely brown medially. Ovipositor sheath light brown, dark basally and apically. Fore wing infuscate. Pterostigma yellowish brown, paler basally.

Discussion. This species is very closely similar to *S. antennalis* Szépligeti (= *S. alipes* Wilkinson; Nixon 1943: couplet 14, page 276); the differences between these species are indicated in the following key:

- 14a. Mesonotum with short rugosity. Height of malar space 0.3 times longitudinal diameter of eye *S. radialis* Szépligeti
 - Mesonotum with long and widely distributed rugosity. Height of malar space about 0.2 times longitudinal diameter of eye *S. antennalis* Szépligeti (= *S. alipes* Wilkinson)

The differences between *S. radialis* and *S. antennalis* are rather problematical, because the holotype of *S. radialis* is smaller than the type of *S. antennalis*. It is quite possible that the 2 supposedly diagnostic characters listed in the key are closely connected only with the size of specimens. The study of more specimens of these species is very important for a final decision about their status.

Distribution. Indonesia (Java)

Group of *Spathius apidanus* Nixon

Spathius minutissimus Szépligeti, 1908
(Figs 75–86)

Spathius minutissimus Szépligeti, 1908: 221; Nixon 1943: 448; Shenefelt and Marsh 1976: 1409.

Material. Holotype: female, "Indonesia, Java, Semarang, 1905", "Holotypus ♀ *Spathius minutissimus* Szépl., 1908" (below: "des. Papp J. 1969"), "Hym. Typ. No. 1590, Mus. Budapest", "*Spathius minutis-*

simus, Semarang, Java, 1905" (handwriting by Szépligeti) (HNHM).

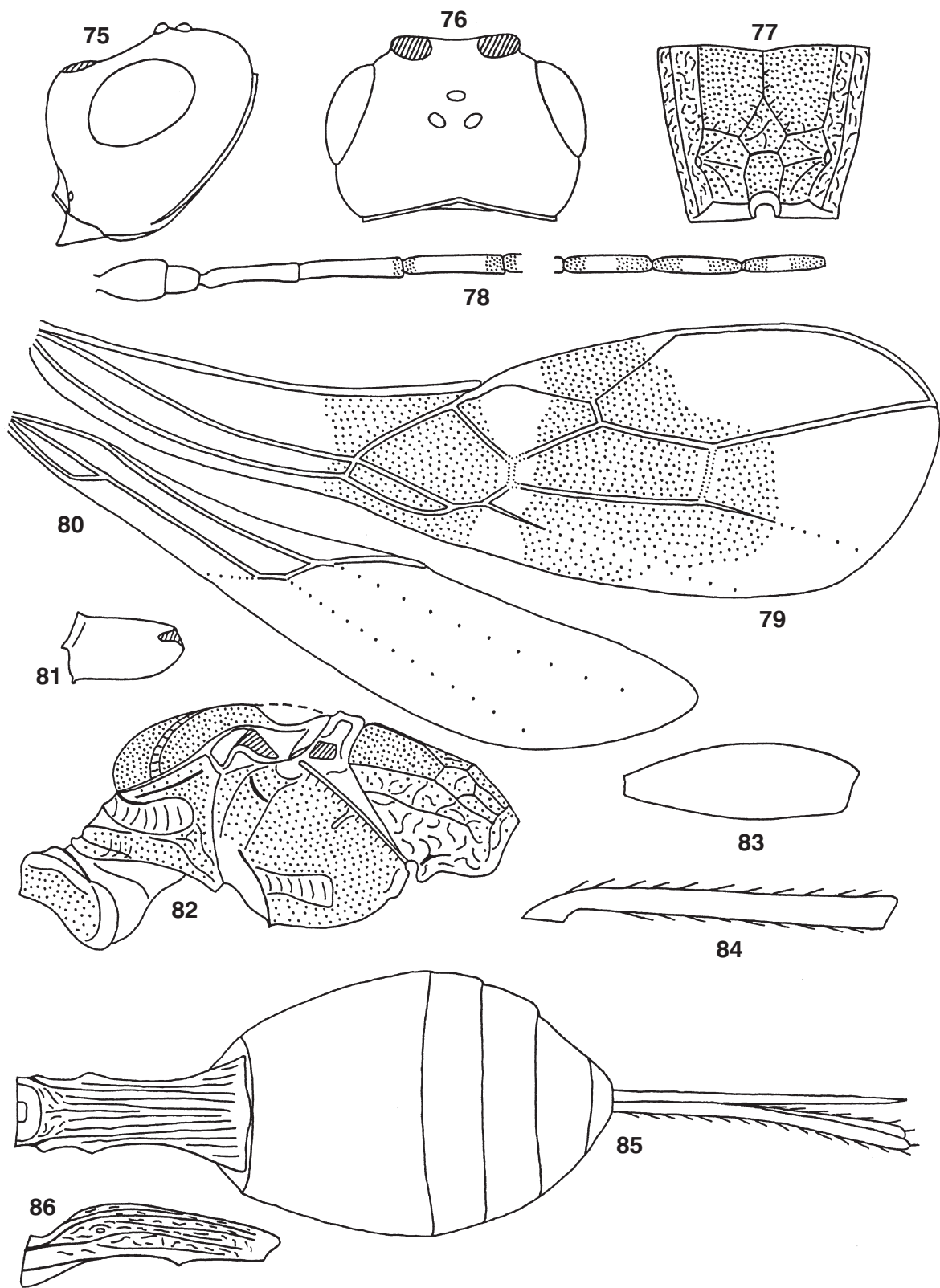
Description. Female. Body length 2.0 mm; fore wing length 1.4 mm. Head not depressed, its width 1.6 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli small, in almost equilateral triangle; POL equal to Od, 0.3 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.6 times eye height and 1.1 times basal width of mandible. Face width 1.2 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.7 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina absent near mandible at short distance and not fused with hypostomal carina, complete dorsally.

Antennae rather slender, filiform, more than 14-segmented (apical segments missing). Scape 1.6 times as long as wide. First flagellar segment 5.5 times as long as its apical width, 0.9 times as long as second segment. Subapical segments about 5 times as long as wide.

Mesosoma. Length of mesosoma almost twice its height. Pronotal keel fine, its posterior branch widely fused with posterior margin of pronotum, anterior branch very fine, indistinct. Pronotum subanteriorly with very fine transverse carina. Pronotal lateral depression wide, shallow, not marginate, rather densely crenulate. Mesoscutum rather highly and roundly raised above pronotum. Notauli deep, complete, rather wide, crenulate. Subalar depression shallow, rather narrow, granulate. Sternauli shallow, straight, wide, crenulate, running along anterior half of lower part of mesopleura. Metanotum without median tooth. Metapleural flange narrow and long. Propodeum without lateral tubercles.

Wings. Fore wing 3.2 times as long as wide. Pterostigma 3.8 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 4.7 times first abscissa and forming weakly obtuse angle with it, 0.55 times third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell narrowed distally, its length almost 3.0 times maximum width, about twice length of narrow brachial cell. Recurrent vein about 3.0 times second abscissa of medial vein. Nervulus interstitial and almost perpendicular to anal vein. Brachial cell closed distinctly before recurrent vein. Parallel vein interstitial. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 5.6 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.55 times second abscissa. Recurrent vein unsclerotized, antifurcal.

Legs. Hind coxa medium size (its length 1.7 times maximum width), with distinct basoventral tooth and corner. Hind femur almost 3.0 times as long as wide. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; sec-



Figures 75–86. *S. minutissimus*: (75) head, lateral view, (76) head, dorsal view, (77) propodeum, (78) basal and subapical segments of antenna, (79) fore wing, (80) hind wing, (81) hind coxa, (82) mesosoma, lateral view, (83) hind femur, (84) hind tibia, (85) metasoma, dorsal view, (86) petiole, lateral view.

ond tarsal segment 0.4 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, strongly and regularly curved in basal half and almost straight in apical half dorsally, distinctly thickened in basal third; distinctly widened in apical third (dorsal view), with small spiracular tubercles in basal third. Length of petiole twice its apical width, 1.6 times length of propodeum; apical width 1.6 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.1 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.55 times as long as metasoma, 1.4 times as long as petiole, 0.4 times as long as fore wing, 0.75 times as long as mesosoma.

Sculpture and pubescence. Head entirely smooth. Mesoscutum densely granulate, with 2 long convergent posteriorly carinae and fine rugosity at narrow medioposterior area, without rugae near notauli and laterally. Scutellum smooth. Mesopleura entirely finely and densely granulate. Metapleura rugose-reticulate. Propodeum with distinctly marginate areas, areola short and wide, petiole area subsquare and distinctly separated; propodeum densely granulate, partly with sparse rugae in posterior half; basal carina as long as fork of areola. Hind coxa almost entirely smooth, with fine striation dorsally. Hind femur finely striate-coriaceous, almost smooth ventrally. Petiole striate, widely granulate-reticulate with sparse transverse rugae in basal $\frac{2}{3}$ between dorsal carinae. Rest of tergites smooth. Mesoscutum with long sparse semi-erect hairs along notauli and laterally. Hairs on dorsal surface of hind tibia short, semi-erect, rather dense, their length about 0.4 times maximum width of tibia.

Colour. Body brownish yellow, mesosoma darker dorsally. Antennae yellow, dark apically, fifth-thirteenth segments yellow medially, brown basally and apically (brown part of segments longer on segments in apical halves). Palpi pale yellow. Legs yellow. Fore wing hyaline, with infuscate spots and transverse stripes near basal vein, below pterostigma and apically. Pterostigma brown, pale yellow in basal $\frac{1}{4}$ and apically.

Discussion. This species is in the *S. apidanus* Nixon group, because of its brachial cell closed distinctly before the level of the recurrent vein and its interstitial parallel vein. *S. minutissimus* Szépligeti is similar to *S. apidanus* Nixon (Nixon 1943: page 273); their differences are indicated in the following key:

1. Body entirely reddish yellow. Antennae yellow, dark apically, fifth-thirteenth segments yellow medially, brown basally and apically. Head entirely smooth. Pronotal keel fine and fused medially with posterior margin of pronotum. Basal carina of propodeum as long as fork of areola *S. minutissimus* Szépligeti
- . Body entirely dark brown. Antennae brownish yellow basally, dark brown apically, without mixed coloration of

fifth-thirteenth segments. Face, frons and part of vertex striate. Pronotal keel sharp and widely separated from posterior margin of pronotum. Basal carina of propodeum twice as long as fork of areola *S. apidanus* Nixon

Distribution. Indonesia (Java).

Group of *Spathius arcesius* Nixon

Spathius bekilyensis Granger, 1949

(Figs 87–98)

Spathius bekilyensis Granger, 1949: 148; Shenefelt and Marsh 1076: 1390.

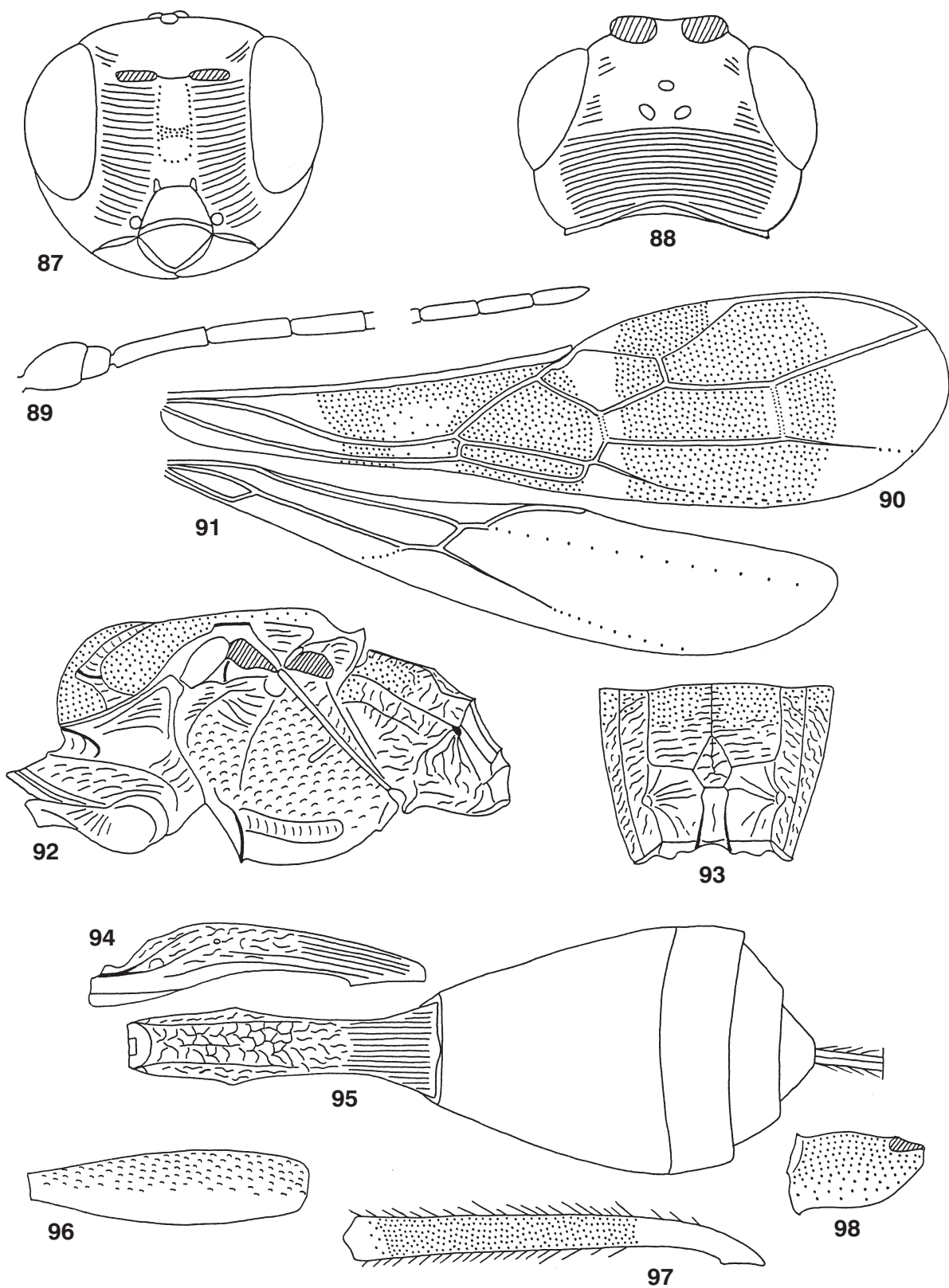
Material. Lectotype (designated here for stability of nomenclature): female, “Madagascar, Bekily, reg. sud de l’île”, “Museum Paris, I-37, A. Seyrig”, “26”, “Type” (MNHN).

Paralectotype: 1 female, “Madagascar, Bekily, reg. sud de l’île”, “Museum Paris, V-37, A. Seyrig”, “36” (MNHN); 1 male, “Madagascar, Bekily, reg. sud de l’île”, “Museum Paris, VIII. 40, A. Seyrig” (MNHN).

Description. Female. Body length 2.5–2.9 mm; fore wing length 2.0–2.2 mm. Head not depressed, its width 1.6 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.6–1.8 times length of temple. Ocelli rather small, in almost equilateral triangle; POL almost equal to Od, 0.25–0.30 times OOL. Eye glabrous, 1.25–1.30 times as high as broad. Malar space height 0.35 times eye height and 0.7–0.8 times basal width of mandible. Face width almost equal to eye height and equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina below complete and independently reaching ventral margin of head; complete dorsally. Hypostomal flange narrow, but distinct. Vertex convex.

Antennae slender, filiform, 26-segmented, 1.3 times as long as body. Scape 1.5–1.6 times as long as wide. First flagellar segment 4.5–5 times as long as its apical width, 1.15 times as long as second segment. Penultimate segment 2.8–3.5 times as long as wide, 0.50–0.55 times as long as first segment, 0.9 times as long as apical segment; the latter obtuse apically.

Mesosoma. Length of mesosoma 1.7–1.8 times its height. Pronotal keel fine, but distinct, posterior branch widely fused medially with posterior margin of pronotum; anterior branch situated before middle of pronotum. Pronotum with fine subanterior carina. Pronotal lateral depression rather indistinct, not marginate, finely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli deep in anterior $\frac{2}{3}$, rather shallow in posterior $\frac{1}{3}$, complete, narrow, crenulate. Prescutellar depression deep, wide, almost smooth or finely rugulose, with high median carina, 0.4 times as long as scutellum. Scutellum convex, with distinct and



Figures 87–98. *S. bekilyensis*: (87) head, frontal view, (88) head, dorsal view, (89) basal and apical segments of antenna, (90) fore wing, (91) hind wing, (92) mesosoma, lateral view, (93) propodeum, (94) petiole, lateral view, (95) metasoma, dorsal view, (96) hind femur, (97) hind tibia, (98) hind coxa.

complete lateral carinae. Subalar depression shallow, wide, granulate. Sternauli narrow, shallow, straight, oblique, finely crenulate, running along anterior $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metanotum with short and pointed tooth. Metapleural flange narrow and rounded apically. Propodeum with very short obtuse lateral tubercles.

Wings. Fore wing 3.3–3.4 times as long as wide. Pterostigma 3.2–3.8 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell weakly shortened; metacarpus 1.1–1.2 times as long as pterostigma. Second radial abscissa 3.6–3.8 times first abscissa and forming almost right angle with it, 0.6–0.7 times third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.3–3.4 times maximum width, 1.4–1.5 times length of narrow brachial cell. Recurrent vein 1.2–1.7 times second abscissa of medial vein. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.5 times nervulus length. Parallel vein interstitial. Brachial cell closed on level of recurrent vein. Mediocubital vein strongly curved to anal vein in distal half. Hind wing 5.0–5.5 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.5 times second abscissa. Recurrent vein unsclerotized, strongly oblique, distinctly antefurcal.

Legs. Fore tibia with dense small spines arranged in one row. Middle tarsus rather long. Hind coxa rather small and narrow (its length 1.7 times maximum width), with distinct basoventral tooth and corner. Hind femur 3.3 times as long as wide. Hind tibia without distinct apical spines on outer margin. Hind tarsus 0.85–0.90 times as long as hind tibia. Hind basitarsus 0.70–0.75 times as long as second-fifth segments combined; second tarsal segment 0.4 times as long as basitarsus, 1.0–1.2 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly and regularly curved ventrally, distinctly and regularly curved dorsally, thickened in basal $\frac{1}{2}$; widened in basal $\frac{1}{3}$ and in apical $\frac{1}{3}$ (dorsal view), with distinct spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 3.3–3.5 times its apical width, 1.7–1.8 times length of propodeum; apical width 1.1 times width at level of spiracles, 1.7 times its minimum width. Second tergite without separated laterotergites. Second suture indistinct. Median length of second and third tergites combined 2.1–2.3 times basal width of second tergite, almost equal to their maximum width. Ovipositor straight. Ovipositor sheath 0.8 times as long as metasoma, 1.8 times as long as petiole, 1.15 times as long as body, 0.55 times as long as fore wing.

Sculpture and pubescence. Vertex finely transversely striate, narrowly smooth posteriorly, sometimes completely smooth. Frons almost smooth or finely striate-granulate at most part. Face transversely striate, narrowly smooth medially. Temple smooth. Mesoscutum

finely and densely granulate, without striae along notauli, with median carina medioposteriorly, sometimes narrowly rugose around carina. Scutellum finely or very finely coriaceous, almost smooth. Mesopleura densely and distinctly coriaceous. Metapleura striate-coriaceous, almost smooth anteriorly. Propodeum rugose-striate in basal $\frac{2}{3}$, but only granulate basally, almost smooth in apical $\frac{1}{3}$; with distinctly marginate areas; areola small and rather wide; petiolate area long and narrow, distinctly separated from areola by high carina; basal carina 1.0–1.8 times as long as fork of areola. Hind coxa densely granulate, finely granulate ventrally, sometimes finely transversely striate dorsally. Hind femur coriaceous, finely coriaceous ventrally. Hind tibia obliquely striate on ventral $\frac{2}{3}$, almost smooth on dorsal $\frac{1}{3}$. Petiole rugose-reticulate in basal $\frac{2}{3}$, sometimes also with dense granulation medially, striate in apical $\frac{1}{3}$. Rest of tergites smooth. Mesoscutum with sparse short semi-erect hairs situated along notauli and marginally. Hairs on dorsal surface of hind tibia short, rather dense, semi-erect, their length 0.5–0.7 times maximum width of tibia.

Colour. Head, promesosoma and petiole brownish yellow, vertex sometimes darker. Rest mesosoma and metasoma medially reddish brown to light reddish brown; metasoma dark reddish brown in apical $\frac{1}{4}$. Two basal segments of antenna yellow, flagellum basally brownish yellow, brown to dark brown at most part, eight apical segments light brown. Palpi yellow. Fore and middle coxae and all trochanters and trochantelli whitish yellow; all parts of fore and middle legs yellowish brown, tibiae paler basally and apically. Hind coxa in posterior half, hind femur entirely, most part of hind tibia light reddish brown, base of coxa and hind tarsus brownish yellow; hind tibia pale yellow in basal $\frac{1}{4}$. Ovipositor sheath brown, paler basally. Fore wing infusate, with hyaline stripes and spots apically, on base of pterostigma, in discoidal and distal half of submedial cells and basally. Pterostigma brown, pale yellow in basal $\frac{1}{4}$.

Male. Body length 1.9 mm; fore wing length 1.5 mm. Head width 1.5 times median length. Transverse diameter of eye 1.5 times length of temple. Antenna 20-segmented. Nervulus interstitial. Hind femur 3.9 times as long as wide. Petiole slender, its length 4.5 times apical width, 2.1 times length of propodeum. Second and third tergites with separated laterotergites. Median length of second and third tergites combined 2.7 times basal width of second tergite, 1.2 times their maximum width. Vertex and frons entirely smooth. Mesoscutum medioposteriorly with one carina only. Mesopleura very finely coriaceous, smooth partly. Most part of mesosoma reddish brown. Antenna darkened toward apex. Fore wing less distinctly infusate. Otherwise similar to female.

Discussion. This species is in the Australian *S. arcesius* Nixon group and is similar to *S. arcesius* Nixon (Nixon 1943: page 392). The differences between these species are indicated in the following key:

1. Hind coxa with distinct basolateral tooth. Head, promesosoma and petiole brownish yellow, rest mesosoma and metasoma medially reddish brown to light reddish brown; metasoma dark reddish brown in apical $\frac{1}{4}$. Frons smooth. Pronotal keel widely fused with posterior margin of pronotum. Mesoscutum almost perpendicularly raised above pronotum. Mesopleura entirely coriaceous. Petiole 1.7–1.8 times as long as propodeum. Ovipositor sheath 0.8 times as long as metasoma *S. bekilyensis* Granger
- . Hind coxa without basolateral tooth. Body entirely dark brown. Frons closely striate. Pronotal keel separated from posterior margin of pronotum. Mesoscutum rather gradually raised above pronotum. Mesopleura widely almost smooth. Petiole 2.5 times as long as propodeum. Ovipositor sheath about as long as metasoma and propodeum combined *S. arcesius* Nixon

Distribution. Madagascar.

Group of *Spathius briareus* Nixon

Spathius variipes Szépligeti, 1905 (Figs 99–110)

Spathius variipes Szépligeti, 1905: 41; Nixon 1943: 448; Shenefelt and Marsh 1976: 1423.

Material. Holotype: female, “N. Guinea, Biro, 1901”, “Friedrich-Wilh.-hafen”, “Holotypus ♀ *Spathius variipes* Szépl. 1905” (below: “des. Papp J. 1969”), “Hym. Typ. No 1588, Mus. Budapest” (HNHM).

Description. Female. Body length 9.0 mm; fore wing length 5.2 mm. Head not depressed, its width 1.6 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye almost twice length of temple. Ocelli medium sized, in triangle with base 1.3 times sides; POL 1.1 times Od, 0.6 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.5 times eye height and 1.1 times basal width of mandible. Face width 0.9 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.8 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina connected with hypostomal carina by fine additional irregular ruga, complete dorsally.

Antennae rather slender, filiform, more than 28-segmented (apical segments missing). First flagellar segment 5.7 times as long as its apical width, 1.3 times as long as second segment.

Mesosoma. Length of mesosoma almost twice its height. Pronotal keel absent, but upper present 2 distinct carinae situated parallel to margin of pronotum. Pronotum subanteriorly with fine transverse carina. Pronotal lateral depression very shallow, short, not marginated, finely and sparsely crenulate. Mesoscutum rather highly and roundly raised above pronotum. Notauli deep, complete, wide, sparsely and coarsely

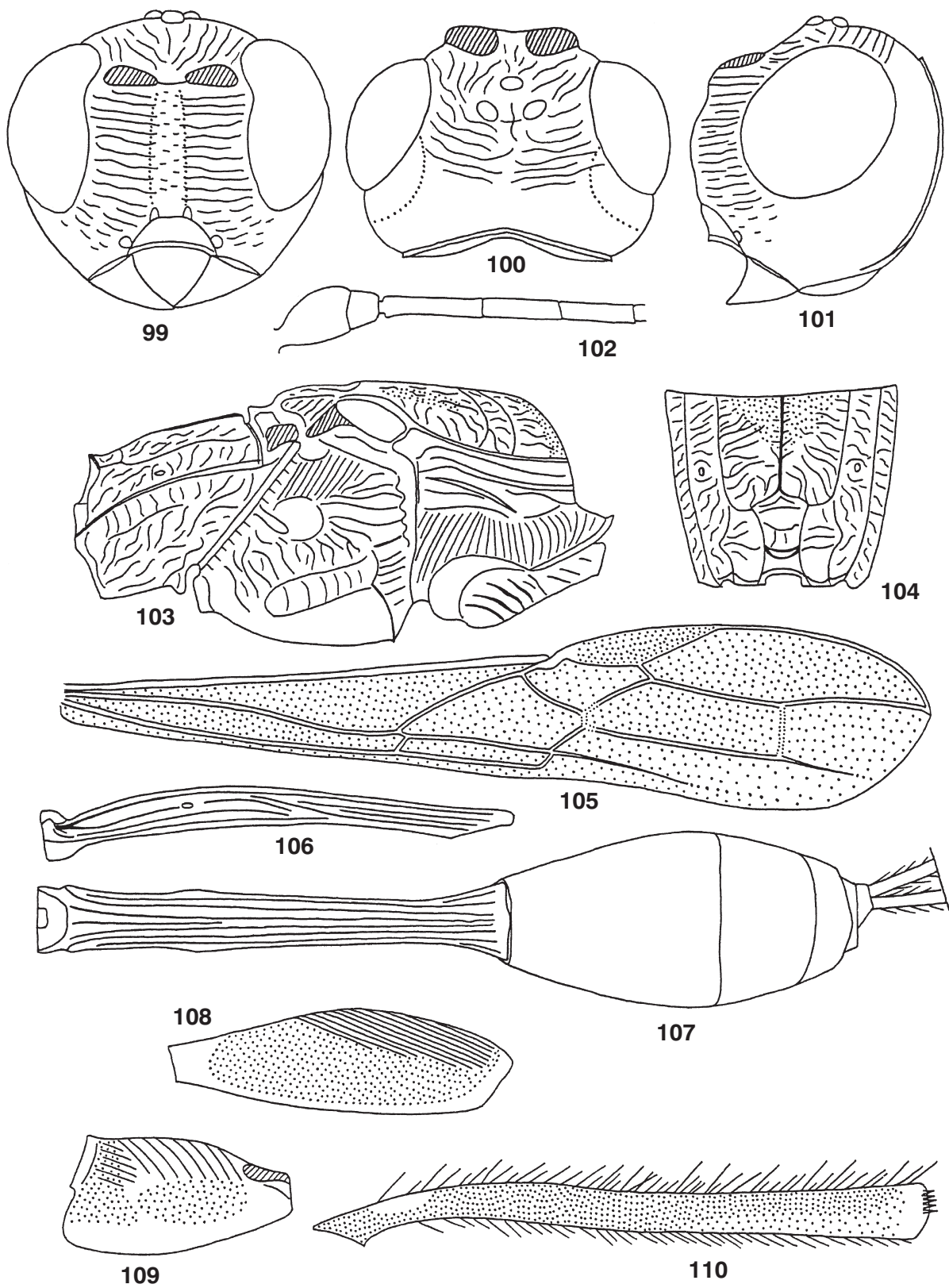
crenulate. Subalar depression rather deep and narrow, coarsely crenulate. Sternauli shallow, rather wide, straight, very finely crenulate, running along anterior half of lower part of mesopleura. Metanotum with short pointed tooth. Metapleural flange long and wide. Propodeum without lateral tubercles.

Wings. Fore wing 4.7 times as long as wide. Pterostigma 4.5 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 6.5 times first abscissa and forming very obtuse angle with it, 0.9 times third abscissa, 1.7 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.6 times maximum width, 1.4 times length of narrow brachial cell. Recurrent vein 2.6 times second abscissa of medial vein. Nervulus distinctly oblique towards base of wing. Distance from nervulus to basal vein 0.4 times nervulus length. Parallel vein almost interstitial. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 6.8 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein almost 0.5 times second abscissa. Recurrent vein unsclerotized, short, antefurcal.

Legs. Fore tibia with numerous spines arranged almost in one row. Hind coxa long (its length twice maximum width), with small basoventral tooth and corner. Hind femur 3.2 times as long as wide. Hind tibia apically with 5 long spines on outer margin and with 4 bands of subapical dense white hairs on inner margin. Hind tarsus missing.

Metasoma. Petiole (lateral view) straight ventrally, dorsally slightly and regularly curved in anterior half and almost straight in posterior half, weakly thickened in basal half; narrowed from base to subapical $\frac{1}{4}$, then weakly widened (dorsal view), with spiracular tubercles in basal third. Length of petiole 6.3 times its apical width, 3 times length of propodeum; its apical width 1.5 times width at level of spiracles. Second tergite with weakly separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 2.8 times basal width of second tergite, 1.2 times their maximum width. Ovipositor straight. Ovipositor sheath 1.5 times as long as metasoma, 2.8 times as long as petiole, 1.5 times as long as fore wing, 0.9 times as long as body, 3 times as long as mesosoma.

Sculpture and pubescence. Vertex rugose-striate in anterior half, smooth in posterior half. Frons coarsely rugose-reticulate. Face entirely densely and partly undulately striate. Temple smooth. Mesoscutum coarsely rugulose and without any ground sculpture, with narrow granulate median areas on lateral lobes and 2 narrow granulate areas on anterior half of median lobe (posterior part of lobe broken by pin). Scutellum with thick undulate semicircular striae, densely striate posteriorly. Mesopleura finely striate, rugulose in posterior $\frac{1}{4}$, with



Figures 99–110. *S. variipes*: (99) head, frontal view, (100) head, dorsal view, (101) head, lateral view, (102) 5 basal segments of antenna, (103) mesosoma, lateral view, (104) propodeum, (105) fore wing, (106) petiole, lateral view, (107) metasoma, dorsal view, (108) hind femur, (109) hind coxa, (110) hind tibia.

smooth narrow median area. Metapleura rather finely striate in anterior half, rugose on rest part. Propodeum with incompletely separated areas, areola rather short and wide, indistinctly marginate anteriorly; petiolate area subsquare, separated from areola lamelliform process; propodeum with sparse undulate striae, almost smooth basally; basal carina distinct, 1.5 times as long as fork of areola. Hind coxa transversely striate in dorsal half, smooth ventrally. Hind femur densely longitudinally striate dorsally, smooth at most part. Petiole densely striate in posterior $\frac{1}{3}$, sparsely in anterior $\frac{2}{3}$, almost smooth medially. Rest of tergites smooth. Mesoscutum with rather dense long semi-erect hairs at wide area along notauli and marginally. Hairs of dorsal surface of hind tibia dense, but sparse in basal $\frac{1}{3}$, short and long, semi-erect, their length 0.4–0.8 times maximum width of tibia.

Colour. Head, mesosoma and petiole black, rest metasoma brownish red, malar space of head reddish. Antenna brown, 2 basal segments yellowish brown. Palpi yellow. Fore and middle legs yellow, dorsal and apical spots of femora, ventral areas in basal $\frac{1}{2}$ – $\frac{1}{3}$ of tibiae and most part of tarsal segments brown. Hind legs dark reddish brown; yellow: hind coxa dorsally and ventrally, trochanters partly, femur basally, and tibia apically; tibia dorsally with white subapical spot. Ovipositor sheath black, light brown subbasally. Fore wing distinctly infusate. Pterostigma entirely brown.

Discussion. The placement of *S. variipes* Szépligeti in a species group is not clear. Preliminarily, it can be included in the *S. briareus* Nixon group, the species of which are known only from the African fauna until now. This species is similar to *S. briareus* Nixon (p. 272); their differences are indicated in the following key:

1. Head black. Anterior part of vertex coarsely sculptured. Most part of mesoscutum coarsely rugose. Scutellum densely striate. Areola of propodeum present, indistinctly marginate anteriorly; petiolate area distinctly separated from areola. Second radial abscissa longer *S. variipes* Szépligeti
- . Head orange yellow. Vertex completely smooth. Most part of mesoscutum closely granulate-reticulate. Scutellum granulate-reticulate. Areola and petiolate area of propodeum absent. Second radial abscissa shorter *S. briareus* Nixon

Distribution. New Guinea.

Group of *Spathius capys* Nixon

Spathius wusheensis Belokobylskij, 1996

Spathius wusheensis Belokobylskij, 1996a: 184 (description, figures).

Material. Holotype, female, China, "Taiwan, Wushe, 1150 m, 15.V.1983, H. Townes" (AEIG).

Discussion. A detailed description of this species in the *S. capys* Nixon group was given by Belokobylskij (1996a: 184–186). This species is rather closely similar

to *S. psammathe* Nixon (Philippines) (Nixon 1943: page 271); the differences between these species are shown in the following key:

1. Head behind eyes distinctly convex. Antennae 18-segmented. Hind tarsus slender. Hairs on dorsal surface of hind tibia longer. Second radial abscissa 0.8 times as long as third abscissa. Ovipositor sheath 0.8 times as long as body *S. wusheensis* Belokobylskij
- . Head behind eyes weakly convex. Antennae about 25-segmented. Hind tarsus thick. Hairs on dorsal surface of hind tibia very short. Second radial abscissa considerably longer than third abscissa. Ovipositor sheath a little longer than body *S. psammathe* Nixon

Distribution. China (Taiwan).

Group of *Spathius cassidorus* Nixon

Spathius albiventris Szépligeti, 1905

(Figs 111–123)

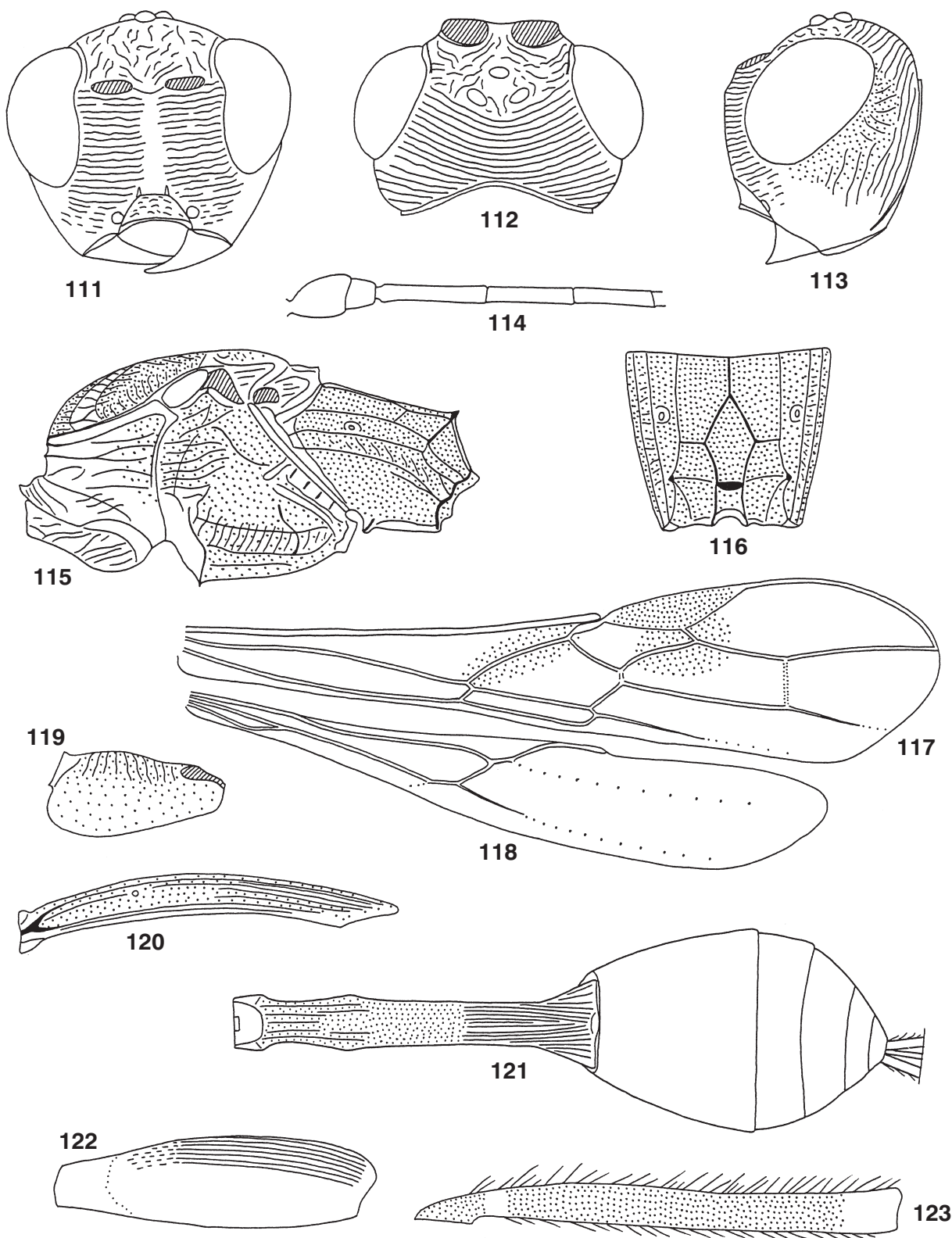
Spathius albiventris Szépligeti, 1905: 41; Nixon 1943: 437; Shenefelt and Marsh 1976: 1388.

Material. Paralectotype: female, "N.-Guinea, Biro, 1899", "Sattelberg, Huon-Golf", "Paralectotypus ♀ *Spathius albiventris* Szepl. 1905" (below: "des. Papp J. 1969"); "Hym. Typ. No 1587, Mus Budapest" (HNHM).

Description. Female. Body length 4.9 mm; fore wing length 3.6 mm. Head not depressed, its width 1.6 times median length. Head behind eyes strongly roundly narrowed. Transverse diameter of eye 2.2 times length of temple. Ocelli rather small, in triangle with base 1.25 times its side; POL almost equal to Od, 0.5 times OOL. Eye sparsely and shortly setose, 1.2 times as high as broad. Malar space height 0.45 times eye height and almost equal to basal width of mandible. Face width equal to eye height and equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.75 times distance from edge of depression to eye, 0.35 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally.

Antennae rather slender, filiform, more than 20-segmented (apical segments missing). Scape 1.5 times as long as wide. First flagellar segment 6 times as long as its apical width, 1.2 times as long as second segment. Submedian segment 3.7 times as long as wide.

Mesosoma. Length of mesosoma almost twice its height. Pronotal keel distinct, but rather fine, posterior branch very shortly separated from posterior margin of pronotum, anterior branch situated on middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression narrow, partly marginate, smooth and with sparse coarse striae. Mesoscutum highly and almost perpendicularly raised



Figures 111–123. *S. albiventris*: (111) head, frontal view, (112) head, dorsal view, (113) head, lateral view, (114) 5 basal segments of antenna, (115) mesosoma, lateral view, (116) propodeum, (117) fore wing, (118) hind wing, (119) hind coxa, (120) petiole, lateral view, (121) metasoma, dorsal view, (122) hind femur, (123) hind tibia.

above pronotum. Notauli rather deep, wide, complete, coarsely and rather sparsely crenulate. Prescutellar depression short, rather deep, with median carina, sparsely rugulose, 0.2 times as long as scutellum. Scutellum weakly convex. Sternauli shallow, straight anteriorly, curved in posterior half, crenulate, running along entire length of lower part of mesopleura. Subalar depression shallow, wide, longitudinally and weakly curvedly striate. Metanotum with small pointed tooth. Metapleural flange short and rather narrow. Propodeum with small pointed lateral tubercles.

Wings. Fore wing 4.2 times as long as wide. Pterostigma rather narrow. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 4.6 times first abscissa and forming very obtuse angle with it (situated almost on one line), 0.7 times third abscissa, 1.2 times distinctly curved first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.5 times maximum width, 1.4 times length of narrow brachial cell. Recurrent vein 3.5 times as long as second abscissa of medial vein. Nervulus oblique towards base of wing. Distance from nervulus to basal vein 0.3 times nervulus length. Parallel vein almost interstitial. Mediocubital vein very weakly curved to anal vein in distal $\frac{1}{4}$. Hind wing 6.5 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.55 times second abscissa. Recurrent vein strongly antefurcal, unsclerotized, very oblique and straight.

Legs. Fore tibia with numerous spines arranged in wide stripe. Hind coxa long (its length twice maximum width), without basoventral tooth and corner. Hind femur 3.3 times as long as wide. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.65 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, as long as fifth segment (without pretarsus). Claws large and strongly curved apically.

Metasoma. Petiole (lateral view) almost straight ventrally, slightly and regularly curved dorsally, distinctly thickened submedially; weakly widened in apical $\frac{1}{5}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 4.3 times its apical width, 2.5 times length of propodeum; apical width 1.6 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.6 times basal width of second tergite, 0.8 times their maximum width. Ovipositor straight. Ovipositor sheath 1.4 times as long as metasoma, 2.5 times as long as petiole, almost twice as long as mesosoma, as long as fore wing.

Sculpture and pubescence. Vertex and frons coarsely undulately transversely striate, with very fine ground granulate sculpture. Face transversely irregularly and coarsely striate. Temple vertically striate at most part, almost smooth below. Mesoscutum coarsely and irregularly rugose at most part, partly with granulation

between rugae, only granulate at narrow elongate areas on lateral lobes and anteriorly of median lobe. Scutellum densely granulate with fine rugosity in anterior half. Mesopleura very finely granulate at most part. Metapleura entirely very finely granulate. Propodeum entirely very finely and densely granulate; areas distinctly marginate, areola long and wide, petiole area separated by very high keel, basal carina 0.8 times as long as fork of areola. Hind coxa coarsely transversely striate dorsally, finely granulate on other part. Hind femur striate dorsally, smooth ventrally. Petiole finely striate, densely and finely granulate between striae in basal 0.8. Rest of tergites smooth. Mesoscutum with short sparse semi-erect hairs along notauli and marginally. Basoventral areas and areola of propodeum not pubescent. Hairs on dorsal surface of hind tibia short, semi-erect or almost erect, their length 0.45–0.60 times maximum width of tibia.

Colour. Head light reddish brown, darkened dorsally. Mesosoma entirely almost black. Petiole, second and third tergites (except whitish margin of third tergite) reddish brown, rest of tergites almost black; apex and ventral side of metasoma whitish. Antenna brown, 2 basal segments yellow in lower half. Palpi pale yellow. Legs dark reddish brown, fore and middle coxae, trochanters, most part of fore femur, basal and ventral half of middle femur, base of hind femur, and apex of all tibiae pale yellow. Ovipositor sheath dark brown. Fore wing distinctly and more or less regularly infusate. Pterostigma brown, very faintly paler basally and apically.

Discussion. This species is in the *S. cassidorus* Nixon group and is closely similar to *S. cassidorus* Nixon (New Guinea) (Nixon 1943: page 267); the differences between these species are indicated in the following key:

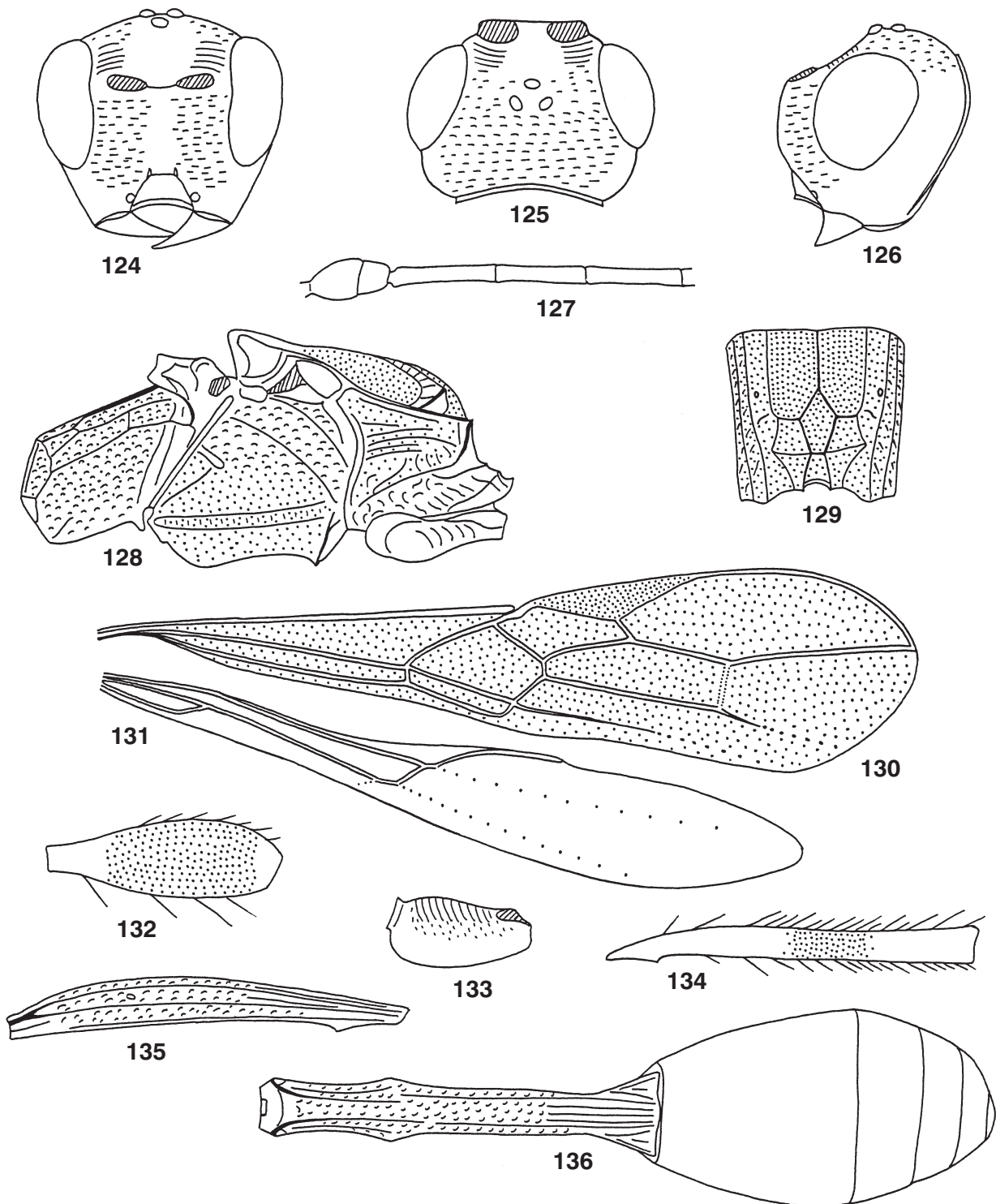
1. Head light reddish brown, darkened dorsally. All tibiae pale yellow apically. Face almost entirely coarsely striate. Ocelli not in equilateral triangle. Pronotal keel distinct medially. Lateral depression of pronotum sparsely striate. Petiole 2.5 times as long as propodeum. Ovipositor sheath 1.4 times as long as metasoma *S. albiventris* Szépligeti
- Head dark brown. All tibiae brownish apically. Face nearly smooth broadly medially, very finely rugulose or subgranulate laterally. Ocelli in almost equilateral triangle. Pronotal keel completely obliterated medially. Lateral depression of pronotum smooth. Petiole twice as long as propodeum. Ovipositor sheath about as long as metasoma *S. cassidorus* Nixon

Distribution. New Guinea.

Spathius minutus Szépligeti, 1900
(Figs 124–136)

Spathius minutus Szépligeti, 1900: 55; Nixon 1943: 441; Shenefelt and Marsh 1976: 1409.

Material. Holotype: male, "N. Guinea, Biro, [18]96", "Friedrich-Wilh.-haffen", "Holotypus ♂ *Spathius minu-*



Figures 124–136. *S. minutus*: (124) head, frontal view, (125) head, dorsal view, (126) head, lateral view, (127) 5 basal segments of antenna, (128) mesosoma, lateral view, (129) propodeum, (130) fore wing, (131) hind wing, (132) hind femur, (133) hind coxa, (134) hind tibia, (135) petiole, lateral view, (136) metasoma, dorsal view.

tus Szépl. 1900" (below: "des. Papp J., 1969"), "Hym. Typ. No 1582 Mus. Budapest", "*Sp. minutus* det. Szépligeti" (HNHM).

Description. Male. Body length 2.5 mm; fore wing length 1.7 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL almost equal to Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.3 times eye height and 0.8 times basal width of mandible. Face width slightly less than eye height and slightly longer than height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally.

Antennae slender, filiform, more than 21-segmented (apical segments missing). First flagellar segment almost 6.0 times as long as its apical width, 1.2 times as long as second segment. Subapical segments 4.8–5.0 times as long as wide.

Mesosoma. Length of mesosoma twice its height. Pronotal keel distinct, posterior branch widely fused with posterior margin of pronotum; anterior branch situated on middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather wide, shallow, incompletely marginate, almost entirely smooth. Mesoscutum distinctly and roundly raised above pronotum. Notauli deep, complete, wide, coarsely and sparsely crenulate. Prescutellar depression deep, wide, with median carina, very finely coriaceous, 0.5 times as long as scutellum. Scutellum convex. Subalar depression shallow, wide, dense and finely granulate. Sternauli narrow, rather deep, weakly curved, very finely crenulate and with dense fine granulation, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum with small pointed lateral tubercles.

Wings. Fore wing 4 times as long as wide. Pterostigma 4.7 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 5.0 times first abscissa and forming distinct angle with it, 0.6 times third abscissa, 1.4 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 4.0 times maximum width, 1.7 times length of brachial cell. Recurrent vein 3.0 times second abscissa of medial vein. Nervulus almost interstitial. Parallel vein interstitial. Mediocubital vein not curved to anal vein in distal half. Hind wing 6.7 times as long as wide. First costal abscissa 0.4 times second abscissa. First abscissa of mediocubital vein 0.4 times second abscissa. Recurrent vein very short, unsclerotized, straight, antefurcal.

Legs. Fore tibia with dense slender numerous spines arranged in rather wide stripe. Hind coxa long (its length almost twice maximum width), without basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) straight ventrally, slightly and more or less regularly curved dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{2}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 5 times its apical width, 2.5 times length of propodeum; apical width 1.4 times width at level of spiracles. Second and third tergites with separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost twice basal width of second tergite, equal to their maximum width.

Sculpture and pubescence. Vertex very finely striate-coriaceous. Frons finely striate, smooth medially. Face transversely striate, smooth medially. Temple smooth, finely sculptured along occipital carina. Mesoscutum densely granulate, without rugae near notauli, with 2 convergent carinae medioposteriorly. Scutellum finely granulate. Mesopleura entirely finely coriaceous. Propodeum entirely densely granulate, with highly marginate areas, areola small and short, pentagonal, petiolate area long, distinctly separated from areola by high carina, basal carina 1.5 times as long as fork of areola. Hind coxa transversely striate dorsally, densely coriaceous laterally. Hind femur almost entirely smooth. Petiole granulate-reticulate, striate laterally and in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with sparse, rather short, semi-erect hairs along notauli and marginally. Mesopleura along pleural suture and metapleura almost entirely with dense adpressed white hairs. Dorsal surface of hind tibia with rather short sparse semi-erect hairs, their length about 0.8 times maximum width of tibia.

Colour. Head brownish yellow. Anterior half of mesosoma light reddish brown. Posterior half of mesosoma and metasoma reddish brown. Antennae brownish yellow basally, submedial segments brown, subapical segments brownish yellow. Palpi yellow. Legs pale yellow, hind coxa in posterior half and most part of hind femur reddish. Fore wing infusate. Pterostigma entirely brown.

Discussion. This species is in the *S. cassidorus* Nixon group and is similar to *S. cassidorus* Nixon (Nixon 1943: page 267); the differences between these species are shown in the following key:

- Ocelli situated in triangle with base 1.2 times its sides. Pronotal keel complete dorsally and widely fused with posterior margin of pronotum. Mesonotum densely and distinctly granulate and without rugae. First radial abscissa forming obtuse angle with second abscissa. Petiole 2.5 times as long as propodeum. Head brownish yellow *S. minutus* Szépligeti

-. Ocelli situated in almost equilateral triangle. Pronotal keel completely obliterated dorsally and not fused with posterior margin of pronotum. Mesonotum finely granulate-reticulate and with distinct rugae. First radial abscissa forming straight line with second abscissa. Petiole twice as long as propodeum. Head dark brown *S. cassidorus* Nixon

Differences between *S. minutus*, redescribing here, and *S. albiventris* are indicated in the following key:

1. Eyes sparsely and shortly setose. Posterior branch of pronotal keel shortly separated from mesoscutum. First costal abscissa of hind wing 0.6 times second abscissa. First abscissa of mediocubital vein of hind wing 0.55 times second abscissa. Second and third tergites without separated laterotergites (female). Vertex coarsely undulately transversely striate, with very fine ground granulate sculpture. Mesoscutum coarsely and irregularly rugose at most part, partly with granulation between rugae, only granulate at narrow elongate areas on lateral lobes and anteriorly of median lobe. Basal carina of propodeum 0.8 times as long as fork of areola. Hairs on dorsal surface of hind tibia 0.45–0.55 as long as maximum width of tibia. Legs dark reddish brown, fore and middle coxae, trochanters, most part of fore femur, basal and ventral half of middle femur, base of hind femur, and apex of all tibiae pale yellow

. *S. albiventris* Szépligeti
 -. Eyes glabrous. Posterior branch of pronotal keel widely fused with posterior margin of mesoscutum. First costal abscissa of hind wing 0.4 times second abscissa. First abscissa of mediocubital vein of hind wing 0.4 times second abscissa. Second and third tergites with separated laterotergites (male). Vertex very finely striate-coriaceous. Mesoscutum densely granulate, without rugae near notauli. Basal carina of propodeum 1.5 times as long as fork of areola. Hairs on dorsal surface of hind tibia 0.8 as long as maximum width of tibia. Legs pale yellow, hind coxa in posterior half and most part of hind femur reddish *S. minutus* Szépligeti

Distribution. New Guinea.

Group of *Spathius elaboratus* Wilkinson

Spathius obesus (Enderlein, 1912)
 (Figs 137–148)

Stenophasmus obesus Enderlein, 1912: 10.

Spathius obesus: Nixon 1943: 450; Shenefelt and Marsh 1976: 1410.

Material. Holotype: female, "Sumatra, Soekaranda, Dr. H. Dohrn S.", "Type" (reddish), "*Stenophasmus obesus* Enderl. ♀ Type, Dr. Enderlein det. 1911", "Mus. Zool. Polonicum, Warszawa 12/45" (MIZW).

Description. Female. Body length 5.2 mm; fore wing length 3.8 mm. Head not depressed, its width 1.4 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli medium sized, in triangle with base 1.4 times its sides; POL 1.4 times Od, 0.6 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4 times eye height and 0.75 times basal width of mandible. Face

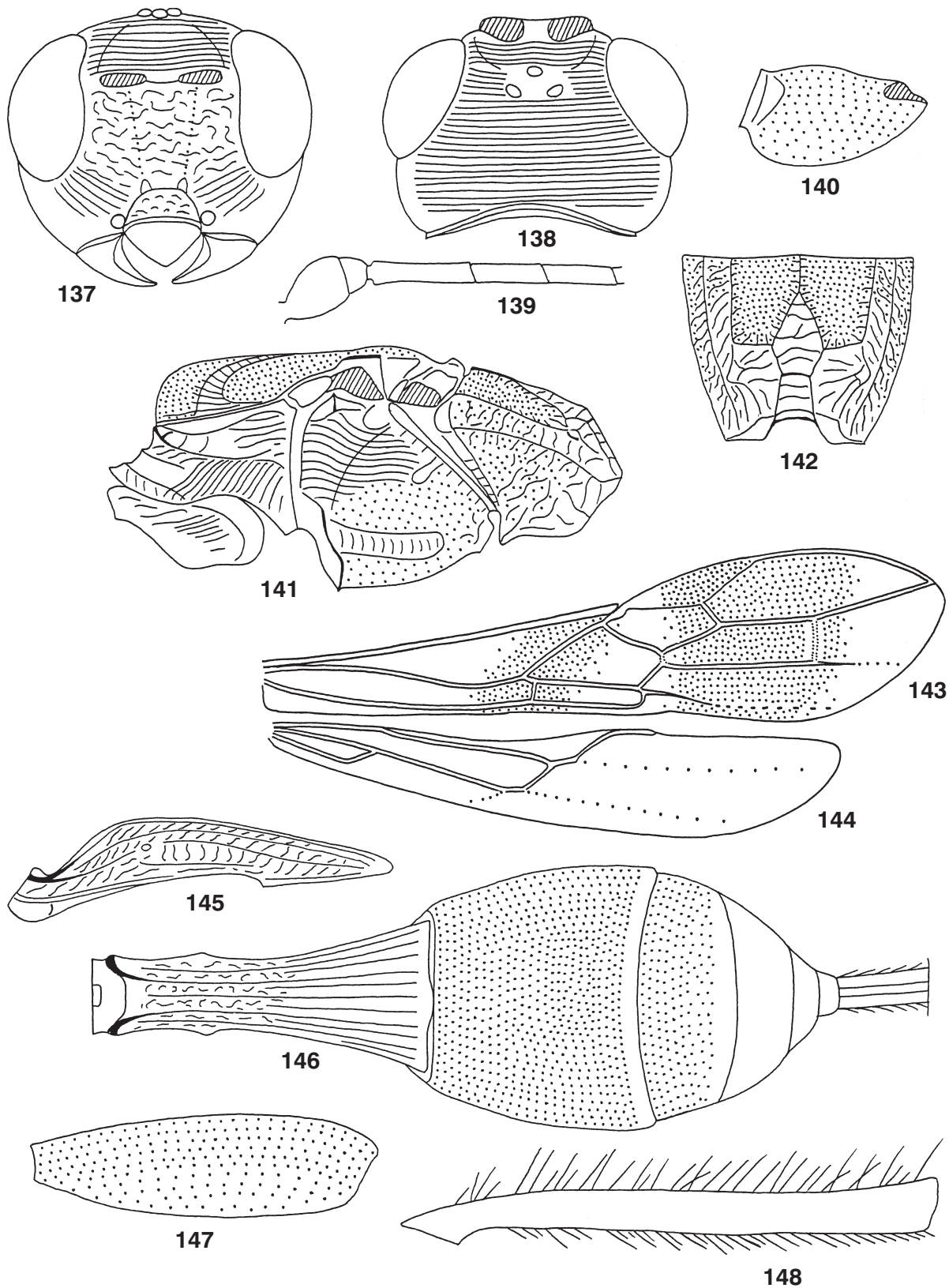
width 0.9 times as long as eye height and 1.1 times height of face and clypeus combined. Clypeal suture deep and complete. Hypoclypeal depression rather large and round, its width almost equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina shortly absent ventrally and fused with hypostomal carina, complete dorsally. Hypostomal flange very narrow. Vertex convex.

Antennae filiform, more than 29-segmented (apical segments missing). Scape 1.5 times as long as wide. First flagellar segment 5.5 times as long as its apical width, 1.4 times as long as second segment. Subapical segments 3 times as long as wide.

Mesosoma. Length of mesosoma almost twice its height. Pronotal keel distinct, posterior branch rather widely fused with posterior margin of pronotum; anterior branch fine and situated almost on middle of pronotum. Pronotum subanteriorly with rather distinct transverse carina. Pronotal lateral depression narrow, rather shallow, distinctly marginate, smooth, but with several fine striae. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep and complete, coarsely crenulate. Prescutellar depression with 3 carinae, partly smooth and very finely rugulose, 0.25 times as long as scutellum. Scutellum weakly convex and with fine carinae laterally. Subalar depression shallow, wide, coarsely rugose-striate. Sternauli rather deep, weakly S-shaped, finely crenulate, running along anterior $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metanotum with short obtuse tooth. Metapleural flange rather short and narrow. Propodeum with very small lateral tubercles.

Wings. Fore wing almost 4 times as long as wide. Pterostigma 4 times as long as wide. Radial vein arising before middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3 times first abscissa and forming obtuse angle with it, 0.8 times third abscissa, 1.5 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.5 times maximum width, 1.35 times length of brachial cell. Recurrent vein 4.3 times second abscissa of medial vein. Nervulus perpendicular to anal vein. Distance from nervulus to basal vein 0.4 times nervulus length. Parallel vein almost interstitial. Mediocubital vein rather distinctly curved to anal vein in distal half. Hind wing 5.7 times as long as wide. First costal abscissa 0.7 times second abscissa. First abscissa of mediocubital vein 0.75 times second abscissa. Recurrent vein weakly sclerotized, straight, antifurcal.

Legs. Fore tibia with dense numerous spines arranged in narrow stripe. Hind coxa rather small (its length 1.5 times maximum width), without basoventral tooth and corner. Hind femur 3.3 times as long as wide. Hind tibia with 5 apical spines on outer margin. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.65 times as long as second-fifth segments combined;



Figures 137–148. *S. obesus*: (137) head, frontal view, (138) head, dorsal view, (139) 5 basal segments of antenna, (140) hind coxa, (141) mesosoma, lateral view, (142) propodeum, (143) fore wing, (144) hind wing, (145) petiole, lateral view, (146) metasoma, dorsal view, (147) hind femur, (148) hind tibia.

second tarsal segment 0.55 times as long as basitarsus, 1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) distinctly curved ventrally, slightly and regularly curved dorsally, thickened in basal third; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.1 times its apical width, 1.5 times length of propodeum; apical width 1.7 times width at level of spiracles. Second tergite with separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.15 times basal width of second tergite, 0.75 times their maximum width. Ovipositor straight. Ovipositor sheath 1.2 times as long as metasoma, 2.6 times as long as petiole, 1.5 times as long as mesosoma, 0.85 times as long as fore wing.

Sculpture and pubescence. Vertex and frons densely and rather coarsely transversely striate, without ground sculpture. Face coarsely rugulose almost entirely. Temple finely or very finely and almost entirely vertically aciculate. Mesoscutum densely and finely granulate, without rugae along notauli (medioposterior part destroyed). Scutellum densely and finely granulate. Mesopleura very finely granulate, striate in upper $\frac{1}{2}$. Metapleura coarsely rugose with fine granulation between rugae. Propodeum rugose, with dense granulation at most part of basolateral areas; with distinctly marginate areas, areola large and wide, petiolate area rather long and distinctly separated from areola; basal carina 0.7 times as long as fork of areola. Hind coxa almost entirely finely and densely granulate. Hind femur finely coriaceous, granulate-coriaceous dorsally. Petiole striate in apical half, rugulose-striate in basal half. Second-fourth tergites densely granulate, sculpture on fourth tergite more fine. Fifth and sixth tergites almost smooth. Mesoscutum with rather dense semi-erect white hairs situated along notauli and marginally. Metapleura bare on not large median area, with long hairs around it. Hairs on dorsal surface of hind tibia rather long, erect and rather dense; their length 0.9–1.1 times maximum width of tibia.

Colour. Head, anterior half of mesosoma, petiole and second-third tergites of metasoma light reddish brown, posterior half of mesosoma and metasoma behind third tergite reddish brown. Antenna light reddish brown, darkened toward apex. Palpi reddish brown, darkened basally. Legs reddish brown, tibiae and tarsi dark reddish brown, hind tibia without pale basal part. Ovipositor sheath reddish brown in basal half, black in apical half. Fore wing infusate, with 3 wide hyaline transverse stripes subbasally, under base of pterostigma and apically. Pterostigma dark brown, yellow in basal $\frac{1}{4}$.

Discussion. This species is in the *S. elaboratus* Wilkinson group and is very similar to *S. elaboratus* Wilkinson (Nixon 1943: couplet 3, page 386); the differences between these species are shown in the following key:

- 3a. Ovipositor sheath longer, 1.2 times as long as metasoma. Hind tarsus dark reddish brown at most part. Second radiomedial cell longer *S. obesus* (Enderlein)
 –. Ovipositor sheath shorter, a little shorter than metasoma. Hind tarsus yellow in basal halves of segments. Second radiomedial cell shorter *S. elaboratus* Wilkinson

Distribution. Indonesia (Sumatra).

Group of *Spathius exarator* Linnaeus

Spathius amoenus Belokobylskij, 1998 (Figs 149–161)

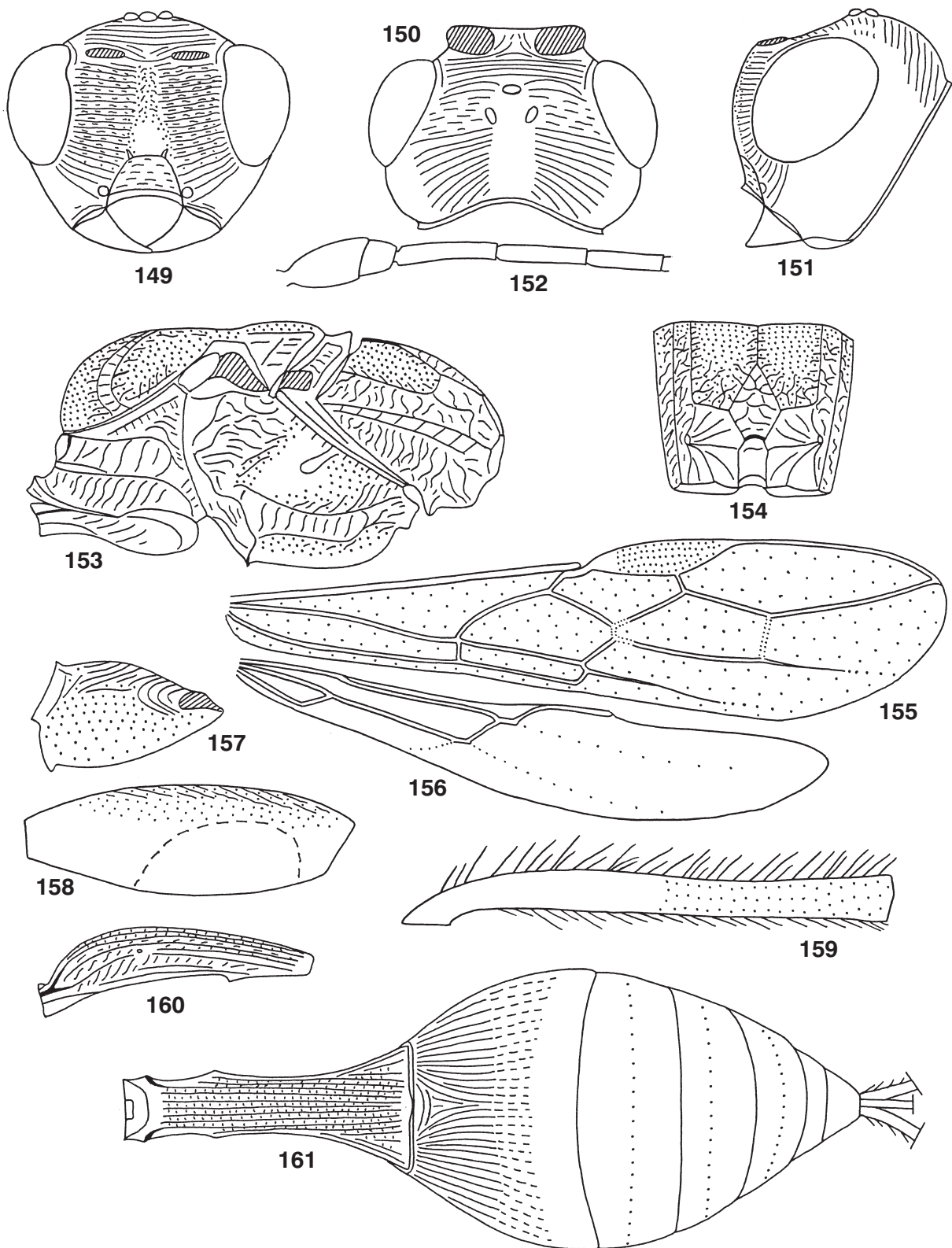
Spathius amoenus Belokobylskij, 1998: 102.

Material. Holotype: female, Japan, Kyushu, “Japan, Mt. Tachibanayama, Fukuoka, 12.VIII.[19]80, C. M. Yoshimoto” (FAHU).

Description. Female. Body length 4.8 mm; fore wing length 3.3 mm. Head width 1.5 times its median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 0.9 times Od, 0.3 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and 0.8 times basal width of mandible. Face width 1.1 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina shortly absent near mandible (but present fine additional striae), not fused with hypostomal carina, complete dorsally. Hypostomal flange distinct and rather narrow. Vertex convex.

Antennae rather slender, filiform, more than 32-segmented (apical segments missing). Scape 1.7 times as long as wide. First flagellar segment 4.5 times as long as its apical width, 1.2 times as long as second segment. Subapical segments 3.5 times as long as wide.

Mesosoma. Length of mesosoma twice its height. Pronotal keel distinct, its posterior branch narrowly fused medially with posterior margin of pronotum, anterior branch distinct and situated submedially. Pronotum subanteriorly with high transverse carina. Pronotal lateral depression distinctly separated by carinae, wide, shallow, sparsely coarsely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, but shallow in posterior $\frac{1}{2}$, wide, complete, rather densely crenulate. Prescutellar depression deep, rather long, with 3 carinae, finely rugulose between carinae, 0.3 times as long as scutellum. Scutellum weakly convex, with lateral carinae. Metanotum with short narrow and pointed dorsal tooth. Subalar depression shallow, wide, rugose-striate. Sternauli rather deep, more shallow in posterior $\frac{1}{2}$, rather narrow, S-shaped, coarsely crenulate,



Figures 149–161. *S. amoenus*: (149) head, frontal view, (150) head, dorsal view, (151) head, lateral view, (152) 5 basal segments of antenna, (153) mesosoma, lateral view, (154) propodeum, (155) fore wing, (156) hind wing, (157) hind coxa, (158) hind femur, (159) hind tibia, (160) petiole, lateral view, (161) metasoma, dorsal view.

running along entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange wide and rather long. Propodeum with short lateral tubercles.

Wings. Fore wing 3.7 times as long as wide. Pterostigma 3.5 times as long as maximum width. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened, metacarpus 1.4 times as long as pterostigma. Second radial abscissa 4.7 times first abscissa and forming distinctly obtuse angle with it, 0.5 times the straight third abscissa, 1.1 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 3.0 times its maximum width, 1.3 times length of brachial cell. Recurrent vein 3.5 times second abscissa of medial vein. Nervulus almost interstitial. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal vein of brachial cell. Mediocubital vein not curved to anal vein. Hind wing 5.5 times maximum width. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein distinctly antefurcal.

Legs. Fore tibia with small slender rather numerous and dense spines arranged in narrow stripe. Hind coxa rather large (its length almost 1.5 times maximum width), with basoventral tooth and corner. Hind femur elongate-oval, 3 times as long as wide. Hind tibia apically without spines. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly and regularly curved ventrally, distinctly and more or less regularly curved dorsally, distinctly thickened in basal $\frac{1}{2}$; strongly widened in apical $\frac{1}{2}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{2}$. Length of petiole 2.2 times its apical width, 1.7 times length of propodeum; apical width almost twice width at level of spiracles. Second tergite without separate laterotergites. Second suture absent. Median length of second and third tergites combined 1.1 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.5 times as long as body, 0.85 times as long as metasoma, 1.3 times as long as mesosoma, 0.7 times as long as fore wing.

Sculpture and pubescence. Vertex transversely striate, striae in posterior half curved and directed towards occipital carina. Frons coarsely and more or less undulately striate, with rugae near ocellar triangle. Face almost entirely striate-rugulose. Temple smooth, but finely striate near occipital carina. Mesoscutum densely granulate, with long rugae near notauli and laterally; lateral lobes medially with long narrow granulate areas. Scutellum densely and distinctly granulate. Mesopleura almost smooth medially, finely sculptured posteriorly. Propodeum coarsely and sparsely rugose, basolateral areas granulate in basal halves; areas distinctly marginate, areola rather small, petiolate area long and dis-

tinctly separated from areola; basal carina 0.8 times as long as fork of areola. Hind coxae densely granulate laterally, coarsely concentrically striate dorsally. Hind femora finely granulate. Petiole coarsely striate, with rugulosity between striae. Second tergite distinctly longitudinally striate, striae curved mediobasally, tergite smooth laterally. Third tergite finely but distinctly longitudinally striate in basal half, smooth laterally and apically. Rest of tergites smooth. Mesoscutum with sparse, rather long and semi-erect hairs along notauli (widely) and laterally. Mesopleura widely bare. Hairs of dorsal surface of hind tibia almost erect, dense, long, their length 0.9–1.0 times maximum width of tibia.

Colour. Head light reddish brown, malar spaces, vertex medially and narrow stripe around eyes yellow. Mesosoma reddish brown, mesoscutum near notauli and scutellum light reddish brown or yellowish brown, sides of pronotum and propodeum dark reddish brown to black. Petiole black, rest metasomal segments dark reddish brown, third-seventh tergites in posterior halves reddish yellow or light reddish brown; sternites yellow mostly. Antennae light reddish brown, darkened toward apex. Palpi pale yellow. Legs light brown, fore and middle legs paler basally, hind femur submedially in ventral $\frac{1}{2}$ – $\frac{3}{4}$ with large dark reddish brown spot, hind tarsus darker, all tibiae pale yellow in basal $\frac{1}{2}$. Ovipositor sheath light reddish brown or reddish brown, dark apically. Fore wing faintly and evenly infuscate, without spots and stripes. Pterostigma dark brown, yellow in basal $\frac{1}{4}$ and apically.

Discussion. The placement of *S. amoenus* Belokobyl'skij in a species group is rather problematical. Provisionally, this species is included in the *S. exarator* (Linnaeus) group on the basis of knowledge of all species of this group and the distinct variation within the group of the special morphological characters. *S. amoenus* Belokobyl'skij is similar to *S. generosus* Wilkinson (Nixon 1943: couplet 4, page 198). The differences are indicated in the following key:

- 4a. Vertex distinctly striate and striae in posterior half curved to occipital carina. Mesoscutum with long rugae near notauli and laterally. Dorsal hairs of hind tibia long. Radial vein arising behind middle of pterostigma *S. amoenus* Belokobyl'skij
 –. Vertex smooth or sometimes finely striate and striae in posterior half not curved to occipital carina. Mesoscutum without or with short rugae near notauli and laterally. Dorsal hairs of hind tibia short. Radial vein arising from middle of pterostigma. *S. generosus* Wilkinson

Distribution. Japan (Kyushu).

Spathius canariensis Hedqvist, 1976
(Figs 162–171)

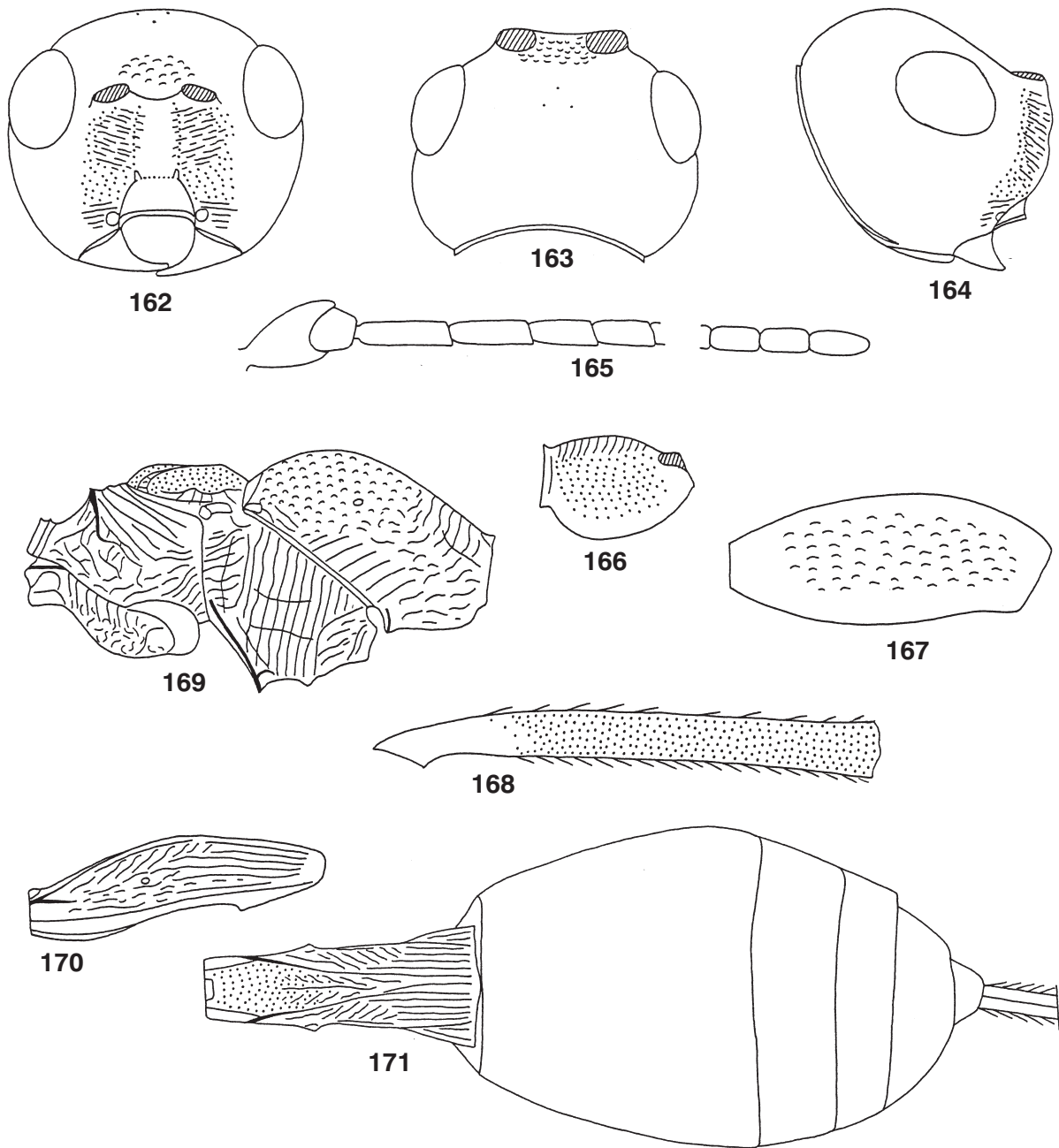
Spathius canariensis Hedqvist, 1976: 51.

Material. Holotype: female, "Canary Is., Tenerife, Las Canadas (sic!), 12/3 1970, K.-J. Hedqvist", "Holotypus *Spathius canariensis* sp. n., ♀, K.-J. Hedqvist det. 1972", "150" (SMNH).

Additional material. Canary Islands: 1 female, "Isl. Can., Tenerife: W El Bailodero, Fayal/Brezal, 900 m, 3.IV.1992, leg. Zerche" (ZISP).

Description. Female. Body length 3.2–3.6 mm. Head not depressed, its width 1.2–1.3 times median length, 1.4

times maximum width of mesoscutum. Head behind eyes weakly convex in anterior half, roundly narrowed in posterior half. Temple 1.1–1.3 times as long as transverse diameter of eye. Ocelli very small or indistinct, almost in equilateral triangle. POL about 2.5 times Od, about 0.3 times OOL. Eye small and shortly setose, about 1.4 times as high as broad. Malar space height 1.1 times height of eye, 1.4 times basal width of mandible. Face width near antennal sockets 1.2–1.3 times eye



Figures 162–171. *S. canariensis*: (162) head, frontal view, (163) head, dorsal view, (164) head, lateral view, (165) basal and apical segments of antenna, (166) hind coxa, (167) hind femur, (168) hind tibia, (169) mesosoma, lateral view, (170) petiole, lateral view, (171) metasoma, dorsal view.

height and 1.4–1.5 times height of face and clypeus combined. Clypeal suture distinct laterally, fine dorsally. Hypoclypeal depression round, its width 0.5–0.7 times distance from edge of depression to eye, 0.3 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina; complete dorsally. Hypostomal flange rather narrow. Vertex convex. Length of maxillary palpi almost equal to height of head.

Antenna rather slender, filiform, 21–22-segmented, about 0.8 times as long as body. Scape 1.5–1.7 times as long as maximum width, 2.5–3.0 times as long as pedicel. First flagellar segment 3.3–3.8 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment almost twice as long as wide, 0.5 times as long as first segment, 0.8 times as long as apical segment; the latter without apical spine and almost obtuse.

Mesosoma apterous, distinctly reduced, its length 2.0–2.2 times maximum height. Pronotal keel high, situated submedially, pronotum strongly and curvedly abruptly from keel toward pronotal apex. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression indistinct. Mesoscutum weakly raised above pronotum. Mesoscutum small, its width 1.5–1.6 times median length. Maximum length of mesopleura 0.7–0.8 times maximum length of propleura. Notauli, prescutellar depression and sternauli indistinct. Scutellum very small and weakly pointed dorsally or completely absent. Metanotum without tooth. Subalar depression deep, narrow, coarsely crenulate. Prepectal carina with wide lateral lobes. Postpectal carina absent. Metapleural flange wide and rather long. Propodeum highly roundly convex, without protuberances and areas, its length (in dorsal view) slightly shorter than length of other part of mesosoma. Wings present as very short and almost glabrous scales.

Legs. Fore tibia with dense slender numerous spines arranged in wide stripe. Hind coxa rather short (its length 1.3 times maximum width), without basoventral tooth and corner. Hind femur elongate-oval, 2.5–3.0 times as long as wide. Hind tibia apically with 3 spines on outer side. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, almost equal to fifth segment (without pretarsus).

Metasoma 1.2 times as long as head and mesosoma combined. Petiole (lateral view) almost straight ventrally, weakly curved dorsally, thickened medially; more or less distinctly widened in apical $\frac{1}{5}$ (dorsal view), with distinct spiracular tubercles in basal $\frac{1}{3}$ – $\frac{2}{5}$. Length of petiole 1.6–2.2 times its apical width, 1.4–1.5 times length of propodeum; apical width 1.3–1.4 times width at level of spiracles. Second and third tergites without separated laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.5–1.6 times basal width of second tergite, about 0.9 times their maximum

width. Ovipositor weakly curved up. Ovipositor sheath 1.1–1.2 times as long as metasoma, 3.3 times as long as petiole, about twice as long as mesosoma.

Sculpture and pubescence. Head smooth, frons finely coriaceous near antennal sockets, face finely striate with granulation in dorsal half or submedially. Promesosoma, meso- and metapleura and propodeum posteriorly coarsely striate with rugosity partly. Mesoscutum densely rugulose-granulate. Propodeum in basal $\frac{2}{3}$ finely or very finely granulate, partly almost smooth. Hind coxa finely granulate, rugose-granulate dorsally, almost smooth ventrally. Hind femur smooth at most part, finely coriaceous dorsally. Petiole with distinct and short dorsal carinae, almost completely rugose-striate, finely coriaceous between dorsal carinae in basal $\frac{1}{3}$. Rest of tergites smooth. Mesoscutum with very short sparse hairs marginally. Mesopleura widely glabrous medially. Hind tibia dorsally with very short, sparse and semi-erect hairs, their lengths 0.2–0.3 times maximum width of tibia. Second and third tergites almost completely or widely with disperse and sparse hairs.

Colour. Body reddish brown or dark reddish brown, head reddish yellow, metasoma behind petiole almost black. Two basal segments of antenna yellow, two following segments brownish yellow, median segments almost black or dark reddish brown, 8 apical segments yellowish brown. Palpi brown yellow or yellow. Legs reddish brown or dark reddish brown partly, trochanters and tibiae basally pale yellow. Ovipositor sheath brownish yellow, but in distal $\frac{1}{3}$ almost black.

Discussion. This apterous species is most probably in the *S. exarator* (Linnaeus) group and is similar to *S. maderi* Fahringer. The differences between all Palaearctic apterous species are indicated after the redescription of *S. maderi* Fahringer below.

Distribution. Spain (Canary Is.).

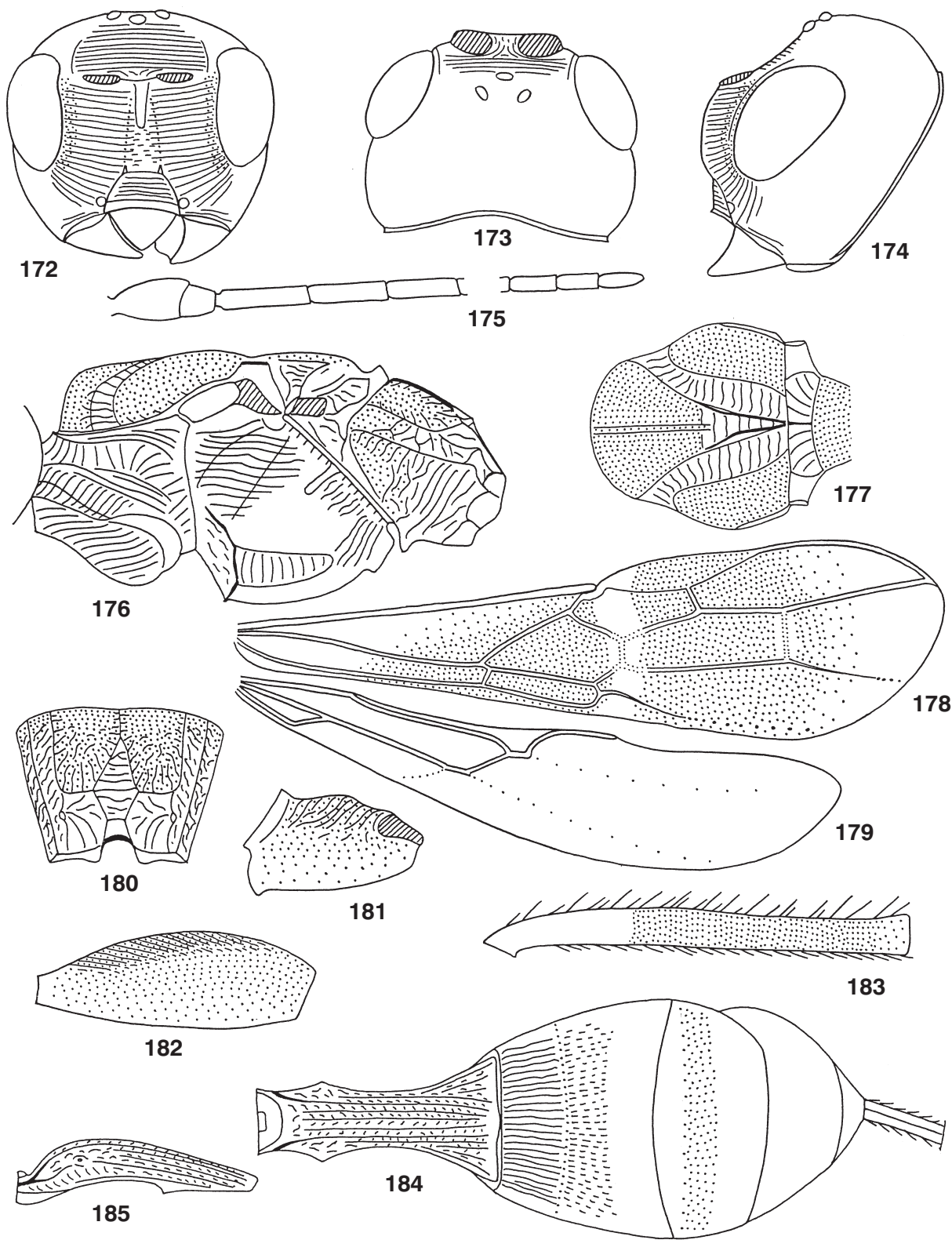
Spathius cavus Belokobylskij, 1998
(Figs 172–185)

Spathius cavus Belokobylskij, 1998: 106.

Material. Holotype: female, Russia, "Primorskii krai, 20 km YuV Spassk [-Dal'nii], les, 28 VI 1985, Belokobylskij" (ZISP).

Paratypes. Russia: 23 females and 2 males from Primorskii krai.

Description. Female. Body length 3.0–5.2 mm; fore wing length 2.5–3.5 mm. Head not depressed, its width 1.4–1.6 times median length. Head behind eyes convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye about equal to length of temple. Ocelli medium sized, in triangle with base 1.10–1.25 times its sides; POL 1.2–1.4 times Od, about 0.3 times OOL. Eye glabrous, 1.2–1.3 times as high as broad. Malar space height 0.45–0.50 times eye height and



Figures 172–185. *S. cavus*: (172) head, frontal view, (173) head, dorsal view, (174) head, lateral view, (175) basal and apical segments of antenna, (176) mesosoma, lateral view, (177) mesoscutum, (178) fore wing, (179) hind wing, (180) propodeum, (181) hind coxa, (182) hind femur, (183) hind tibia, (184) metasoma, dorsal view (185) petiole, lateral view.

0.7–0.8 times basal width of mandible. Face width 1.1–1.2 times eye height and about 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.4–0.5 times width of face. Occipital carina shortly absent near mandible, not fused with hypostomal carina. Hypostomal flange narrow. Vertex convex.

Antennae rather slender, filiform, 30–35-segmented, almost as long as body. Scape 1.5–1.8 times as long as wide. First flagellar segment 4.5–5.0 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 2.5–2.7 times as long as wide, 0.40–0.45 times as long as first segment, 0.8–0.9 times as long as apical segment; the latter weakly pointed apically.

Mesosoma. Length of mesosoma 1.8–2.0 times its height. Pronotal keel distinct, but fine, its posterior branch fused medially with posterior margin of pronotum, anterior branch situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather wide, shallow, partly marginate, sparsely and coarsely crenulate. Mesoscutum highly and roundly raised above pronotum, weakly concave on wide area in medioposterior half. Notauli deep, complete, wide, coarsely and densely crenulate-rugose. Prescutellar depression deep, wide, with 3 carinae, finely rugulose, about 0.4 times as long as scutellum. Scutellum convex, with lateral carinae. Metanotum with short obtuse wide tooth. Subalar depression rather deep, wide, densely rugulose-striate. Sternauli wide, rather deep, straight, coarsely and densely crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum without lateral tubercles.

Wings. Fore wing 3.4–3.6 times as long as wide. Pterostigma 4.3–4.6 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.1–1.2 times as long as pterostigma. Second radial abscissa 2.6–4.0 times first abscissa and forming distinctly obtuse angle with it, 0.50–0.55 times third abscissa, 0.9–1.0 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.2–3.5 times its maximum width, 1.4–1.5 times length of brachial cell. Recurrent vein 1.5–2.0 times second abscissa of medial vein. Distance from nervulus to basal vein 0.3–0.7 times nervulus length. Nervulus distinctly oblique towards base of wing. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein weakly curved to anal vein. Hind wing 4.5–4.8 times as long as wide. First costal abscissa 0.5–0.6 times second abscissa. First abscissa of mediocubital vein 0.55–0.60 times second abscissa. Recurrent vein long, unsclerotized, curved toward base of wing, antefurcal.

Legs. Fore tibia with dense, rather thick numerous spines arranged in wide stripe. Hind coxa rather short

(its length 1.4–1.6 times maximum width), with basoventral tooth and corner. Hind femur elongately oval, 2.7–3.0 times as long as wide. Hind tibia apically with 5 spines on outer side. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6–0.7 times as long as second-fifth segments combined; second tarsal segment 0.5–0.6 times as long as basitarsus, 1.4 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) curved ventrally, distinctly and more or less regularly curved in basal half, almost straight in apical half dorsally, thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.0–2.2 times its apical width, 1.8–2.0 times length of propodeum; apical width 1.5–1.6 times width at level of spiracles. Second tergites with separated laterotergite in basal half. Second suture present, but fine. Median length of second and third tergites combined 1.0–1.2 times basal width of second tergite, 0.7 times their maximum width. Ovipositor distinctly curved up. Ovipositor sheath 1.1–1.3 times as long as metasoma, 2.8–3.3 times as long as petiole, 1.6–2.0 times as long as mesosoma, 0.8–0.9 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, rarely finely transversely striate partly. Frons densely and almost entirely transversely striate. Face entirely densely transversely striate with granulation between striae. Temple vertically densely and finely striate in posterior half, smooth in anterior half. Mesoscutum densely granulate, without rugae near notauli, with 2 convergent carinae medioposteriorly, widely rugose-striate on medioposterior half. Scutellum densely granulate. Mesopleura smooth in below half. Propodeum with distinctly marginate areas, areola rather long, pentagonal, petiolate area very short, distinctly separated from areola by high carina; propodeum densely and coarsely rugose-reticulate, basolateral areas in basal half densely granulate; basal carina 0.4–0.7 times as long as fork of areola. Hind coxae finely and densely granulate, transversely striate dorsally. Hind femora almost entirely granulate-coriaceous, finely striate dorsally. Petiole striate, with coarse rugosity between striae, only rugose on wide mediobasal half. Second tergite very densely rugulose-areolate; third tergite finely and densely coriaceous-punctulate in basal half. Rest of tergites smooth, except finely punctulate bases of fourth and fifth tergites. Mesoscutum with sparse, short, semi-erect hairs along notauli and marginally. Mesopleura bare at most part. Dorsal surface of hind tibia with short rather dense semi-erect hairs, their length 0.5–0.7 times maximum width of tibia.

Colour. Head light reddish brown. Mesosoma and metasoma dark reddish brown or almost black, promesosoma and anterior part of mesoscutum often reddish brown. Antennae brownish yellow in basal half, distinctly infuscate to black in apical half. Palpi brownish yellow. Legs reddish brown, hind legs more darker, all

trochanters, fore coxa, all tarsi (except fifth segments) yellow to brownish yellow; hind tibia pale yellow in basal $\frac{1}{3}$ – $\frac{1}{4}$. Ovipositor sheath almost entirely black. Fore wing with two large infuscate spots. Pterostigma dark brown, pale yellow in basal $\frac{1}{3}$.

Discussion. This species is in the *S. exarator* (Linnaeus) group and it is quite possible that *S. cavus* Belokobylskij is only an Eastern Palaearctic form (vicariant) of the closely similar Western Palaearctic *S. curvicaudis* Ratzeburg. The differences between these species are indicated in the following key:

1. Second radial abscissa almost as long as first radiomedial vein. Scutellum distinctly densely granulate. Radial vein arising from middle of pterostigma. Third tergite sculptured in basal half. Medioposterior depression of mesoscutum rather deep and coarsely transversely rugose-striate. Propodeum and petiole dark. Palpi brownish yellow. Basal carina of propodeum shorter than fork of areola *S. cavus* Belokobylskij
- Second radial abscissa usually distinctly shorter than first radiomedial vein. Scutellum finely or very finely granulate. Radial vein arising behind middle of pterostigma. Third tergite entirely smooth. Medioposterior depression of mesoscutum shallow and without coarse transverse striation. Propodeum and petiole pale. Palpi reddish brown or dark reddish brown, only distal segment pale. Basal carina of propodeum not shorter than fork of areola *S. curvicaudis* Ratzeburg

Distribution. Russia (Primorskii krai), Korea, Japan (Honshu I.).

Spathius depressithorax Belokobylskij, 1998
(Figs 186–198)

Spathius depressithorax Belokobylskij, 1998: 98.

Material. Holotype: female, Russia, “Primorskii krai, 20 km YuV Ussuriyska, les, 18.07.1996, S. Belokobylskij” (ZISP).

Paratypes. Russia: 37 females and 21 males from Primorskii and Khabarovskii krai and Kuril Is.

Description. Female. Body length 2.9–5.2 mm; fore wing length 2.3–3.6 mm. Head weakly depressed, its width 1.3–1.4 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.0–1.3 times length of temple. Occiput weakly concave. Ocelli medium sized, in triangle with base 1.3–1.4 times its sides; POL 1.3–1.7 times Od, 0.45–0.60 times OOL. Eye glabrous, 1.3–1.4 times as high as broad. Malar space height 0.4–0.5 times height of eye and about 0.7 times basal width of mandible. Face convex, its width almost equal to eye height and 1.2–1.3 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8–1.0 times distance from edge of depression to eye, about 0.4 times

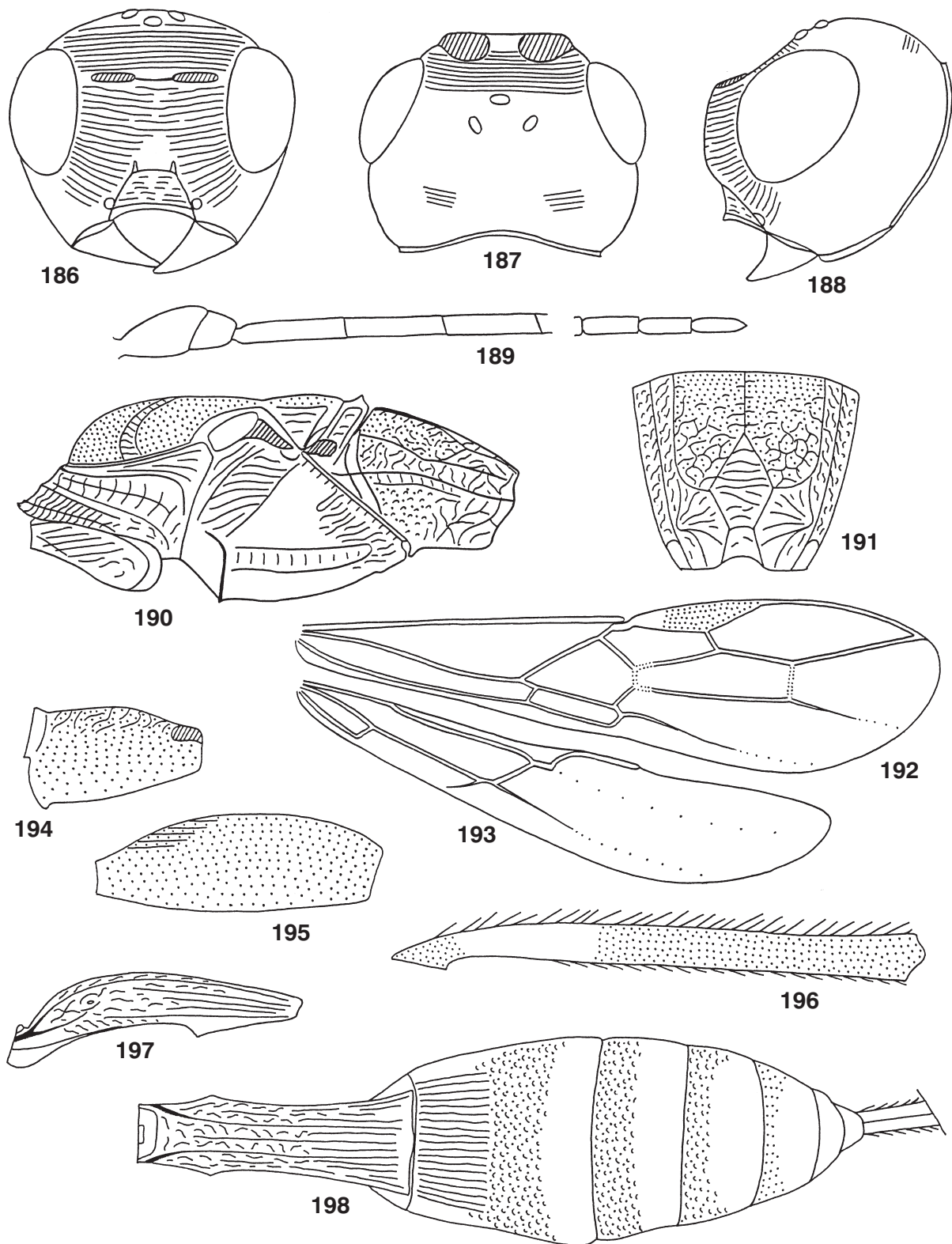
width of face. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Vertex weakly or very weakly convex.

Antennae rather slender, filiform, 28–41-segmented. Scape 1.5–1.6 times as long as maximum width. First flagellar segment 4–5 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 3.0–3.5 times as long as wide, 0.45–0.60 times as long as first segment, almost as long as apical segment; the latter obtuse apically.

Mesosoma more or less distinctly depressed. Length 2.3–2.7 times its height. Pronotal keel more or less distinct, posterior branch shortly fused with posterior margin of pronotum or situated closely to it, anterior branch situated submedially. Pronotum without distinct subanterior carina. Pronotal lateral depression narrow, rather deep, marginate almost completely, densely crenulate. Mesoscutum not highly and roundly raised above pronotum. Notauli shallow, rather wide, coarsely crenulate with fine granulation between crenulae. Prescutellar depression rather deep, short, with several carinae, rugulose between carinae, 0.25–0.30 times as long as scutellum. Scutellum almost flat or weakly convex, with lateral carinae. Metanotum without tooth, with weak tubercle. Subalar depression shallow, rather wide, rugose-striate. Sternauli deep, wide, coarsely crenulate, running along anterior $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather short and wide. Propodeum without distinct lateral protuberances.

Wings. Fore wing 3.6–4.0 times as long as wide. Pterostigma 4.2–4.5 times as long as wide. Radial vein of fore wing arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.2–1.3 times as long as pterostigma. Second radial abscissa 3.8–4.0 times first abscissa and forming distinct corner with it, 0.5–0.6 times third abscissa, 0.9–1.1 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 3.2–3.5 times maximum width, 1.4–1.7 times length of brachial cell. Recurrent vein 2.0–2.3 times second abscissa of medial vein. Distance from nervulus to basal vein 0.25–0.45 times nervulus length. Nervulus almost perpendicular to anal vein. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein not or weakly curved to anal vein. Hind wing 4.8–5.3 times as long as maximum width. First costal abscissa 0.50–0.55 times second abscissa. First abscissa of mediocubital vein 0.5–0.6 times second abscissa. Recurrent vein long, curved, distinctly infuscate, almost interstitial or antefurcal.

Legs. Fore tibia with rather thick dense numerous spines arranged in rather wide stripe. Hind coxa long (its length 1.8–2.0 times maximum width), with small basoventral tooth and distinct basoventral corner. Hind femora elongate-oval, 2.7–3.2 times as long as wide.



Figures 186–198. *S. depressithorax*: (186) head, frontal view, (187) head, dorsal view, (188) head, lateral view, (189) basal and apical segments of antenna, (190) mesosoma, lateral view, (191) propodeum, (192) fore wing, (193) hind wing, (194) hind coxa, (195) hind femur, (196) hind tibia, (197) petiole, lateral view, (198) metasoma, dorsal view.

Hind tibia apically with 4–6 spines on outer side. Hind basitarsus 0.75–0.85 times as long as second–fifth segments combined. Second tarsal segment 0.40–0.45 times as long as basitarsus, 1.5–1.7 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight or weakly curved ventrally, distinctly and rather regularly curved dorsally, weakly thickened in basal 1/3; weakly and regularly widened in distal third (dorsal view), with distinct spiracular tubercles in basal quarter. Length of petiole 2.3–2.7 times its apical width, 1.6–2.0 times length of propodeum; apical width 1.3–1.5 times width at level of spiracles. Second tergite with separate laterotergites. Second suture very fine. Median length of second and third tergites combined 1.3–1.6 times basal width of second tergite, 0.8–0.9 times their maximum width. Ovipositor almost straight. Ovipositor sheath 1.4–1.6 times as long as metasoma, 0.6–0.8 times as long as body, 0.8–1.3 times as long as fore wing.

Sculpture and pubescence. Vertex usually finely striate, especially laterally or sometimes almost entirely smooth. Frons densely and rather coarsely or finely striate. Face rugulose-striate entirely. Temple smooth or sometimes finely striate posteriorly. Mesoscutum densely granulate, with short striation anteriorly, coarsely rugose on wide medioposterior area; without rugae near notauli. Scutellum finely and densely granulate. Mesopleura smooth almost completely, sometimes finely rugulose-striate partly. Propodeum densely reticulate-rugose with granulation anteriorly, sparsely striate posteriorly, with finely marginate areas; areola wide and rather large, petiolate area short and distinctly separated from areola by strong carina; basal carina rather long, 0.9–1.6 (sometimes twice in small specimens) times as long as fork of areola. Hind coxa finely and densely granulate, rugulose-striate dorsally. Hind femora finely and densely granulate-coriaceous. Petiole striate with rugosity between striae especially in basal 2/3. Second tergite striate with reticulation; third tergite in basal 1/2–2/3 densely and finely reticulate, fourth tergite basally and sometimes fifth tergite finely reticulate-punctulate. Mesoscutum with short, rather sparse, semi-erect hairs along notauli and marginally. Mesopleura bare on wide area. Hairs of dorsal surface of hind tibia rather dense, short and semi-erect, their length 0.6–0.7 times maximum width of tibia.

Colour. Body reddish or dark reddish brown. Antennae light reddish brown in basal half, dark brown in apical half. Palpi pale brown. Legs pale reddish brown, middle and hind femora and tibiae medially reddish or dark reddish brown, all tibiae pale yellow in basal 1/4–1/5. Fore wing faintly or rather distinctly infusate, especially along veins. Pterostigma brown, yellow in basal third.

Male. Body length 2.2–4.6 mm; fore wing length 1.8–3.5 mm. Length of petiole 2.8–3.2 times as long as wide. Otherwise similar to female.

Discussion. This species is in the *S. exarator* (Linnaeus) group and is similar to *S. generosus* Wilkinson (Nixon 1943: couplet 4, page 198). The differences are indicated in the following key:

- 4a. Mesosoma depressed, its length 2.3–2.7 times maximum height. Mesoscutum weakly and gently-roundly raised above pronotum. Ovipositor sheath 0.8–1.3 times length of fore wing *S. depressithorax* Belokobylskij
 –. Mesosoma not depressed, its length 1.8–2.0 times maximum height. Mesoscutum highly and almost perpendicularly raised above pronotum. Ovipositor sheath 0.5–0.7 times length of fore wing *S. generosus* Wilkinson

S. depressithorax Belokobylskij is similar also to the Chinese *S. bellus* Chao (Chao, 1956) and differs from that species by its long ovipositor sheath, its wide areola of propodeum, and its pale yellow basal 1/4–1/5 of the hind tibia.

Distribution. Russia (Khabarovskii and Primorskii krai, Kuril Is.).

Spathius dentatus Telenga, 1941
(Figs 199–210)

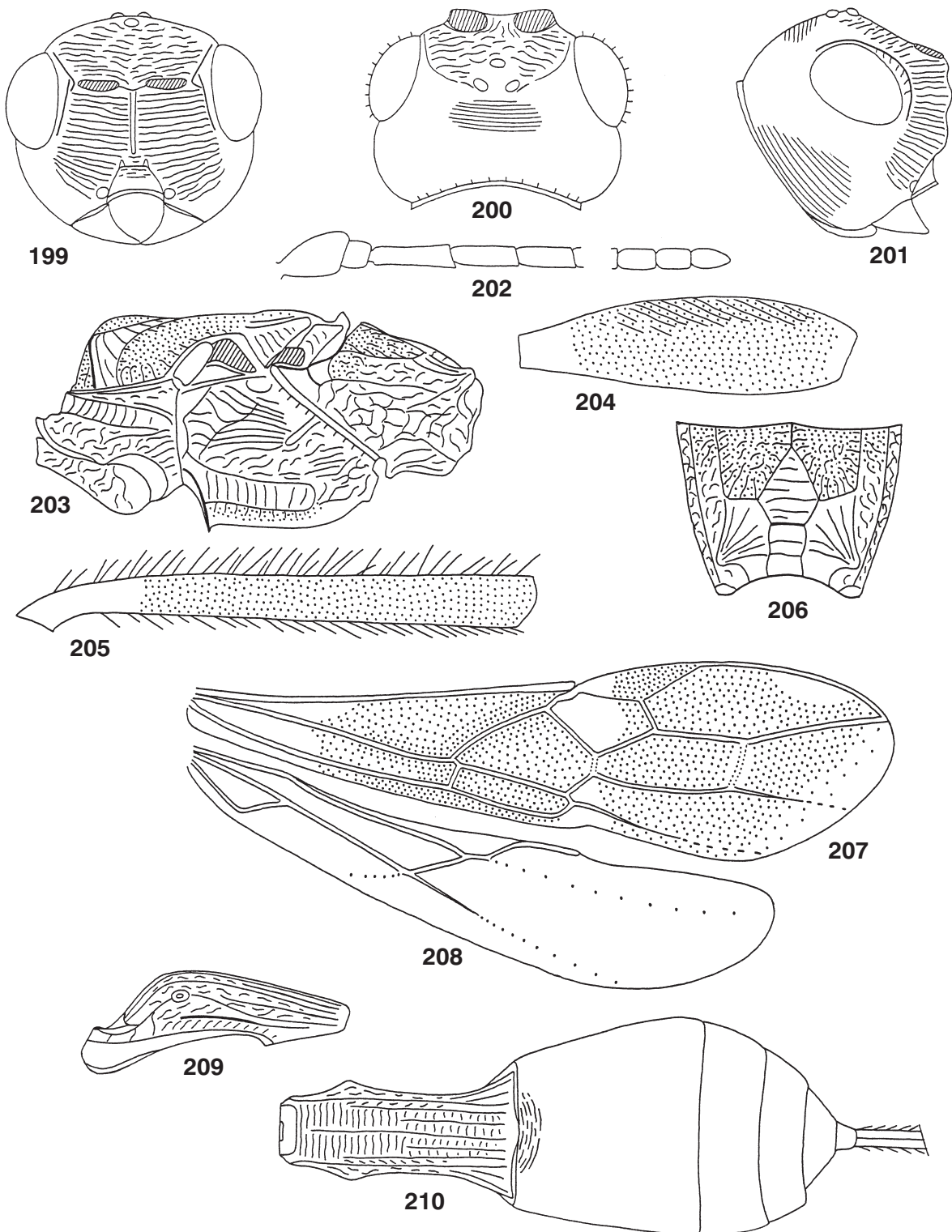
Spathius dentatus Telenga, 1941: 36; Shenefelt and Marsh 1976: 1397; Capek et al. 1982: 334; Belokobylskij and Tobias 1986: 28.

Material. Lectotype (Belokobylskij and Tobias 1986: 28): female, Russia, Yaroslavl Province (?), golden circle, “9.VI.[18]98, B. sl. gore, pod koroy 8 let. ber.”, “k. Kokujeva” (ZISP).

Additional material. Russia: 1 female, Orenburg Province, Buzulukskiy Bor, s. Borovoe, mixed forest, 5.VI.1986 (A. Kotenko).

Description. Female. Body length 4.6–4.8 mm; fore wing length 3.1 mm. Head width 1.5 times its median length. Head behind eyes roundly narrowed behind eye. Transverse diameter of eye almost equal to length of temple. Occiput distinctly concave. Ocelli small, in triangle with base 1.2 times its sides. POL 1.3–1.5 times Od, 0.3–0.4 times OOL. Eye oval, with short and sparse hairs, 1.3 times as high as broad. Malar space height 0.7 times height of eye and 1.3 times basal width of mandible. Face weakly convex, its width 1.4–1.5 times eye height and 1.3–1.5 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.6–0.7 times distance from edge of depression to eye, 0.3 times width of face. Occipital carina fused with hypostomal carina near mandible, complete dorsally. Vertex convex.

Antennae weakly thickened, filiform, 28–30-segmented. Scape 1.8 times as long as maximum width. First flagellar segment 3.5–3.8 times as long as its apical width, 1.2–1.4 times as long as second segment. Penultimate segment 1.8 times as long as wide, 0.45 times as long as first segment, nearly as long as apical segment; the latter weakly pointed apically and without spine.



Figures 199–210. *S. dentatus*: (199) head, frontal view, (200) head, dorsal view, (201) head, lateral view, (202) basal and apical segments of antenna, (203) mesosoma, lateral view, (204) hind femur, (205) hind tibia, (206) propodeum, (207) fore wing, (208) hind wing, (209) petiole, lateral view, (210) metasoma, dorsal view.

Mesosoma. Length twice its height. Pronotal keel fine, its posterior branch very fine and not fused with posterior margin of pronotum, but closely situated to it; anterior branch distinct and situated submedially. Pronotum subanteriorly without distinct carina. Pronotal lateral furrow marginate laterally, rather wide, shallow, crenulate. Mesoscutum highly and almost perpendicularly raised above pronotum. Anterolateral corners of median lobe of mesoscutum distinct, but obtuse. Notauli complete, deep, wide, crenulate. Prescutellar depression deep, long, with 3 distinct carinae, finely sculptured between carinae, 0.3–0.4 times as long as scutellum. Scutellum weakly convex and with lateral carinae. Subalar depression wide, shallow, coarsely crenulate. Sternauli wide, deep, coarsely and densely crenulate, running along anterior $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Propodeum with distinct, wide and obtuse lateral protuberances.

Wings. Fore wing 3.5 times as long as wide. Pterostigma 4.0 times as long as wide. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened, metacarpus 1.4–1.5 times as long as pterostigma. Second radial abscissa 2.8–3.0 times first abscissa and forming distinct and almost straight angle with it, 0.7 times the straight third abscissa, 1.3–1.5 times first radiomedial vein. Second radiomedial cell not narrowed apically, its length 2.7–3.3 times its width, 1.4 times length of brachial cell. Recurrent vein 2.8 times second abscissa of medial vein. Distance from nervulus to basal vein 0.2 times nervulus length. Brachial cell closed behind recurrent vein. Parallel vein not interstitial, arising from anterior third of distal margin of brachial cell. Mediocubital vein not curved to anal vein. Hind wing 5 times as long as wide. First costal abscissa 0.8 times second abscissa. First abscissa of mediocubital vein 0.7–0.8 times second abscissa. Recurrent vein long, sclerotized, distinctly curved, weakly antefurcal.

Legs. Fore tibia with several short slender spines arranged almost in one row. Hind coxa large and short (its length 1.3 times maximum width), with basoventral tooth and corner. Hind femora elongate-oval, 3.3–3.5 times as long as wide. Hind tibia apically without distinct spines. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth tarsal segments combined. Second tarsal segment almost 0.5 times as long as basitarsus, 1.4 times as long as fifth segment (without pretarsus).

Metasoma. Thick petiole (in lateral view) weakly curved ventrally, distinctly curved in basal half and straight in apical half dorsally, strongly thickened in basal half, distinctly and regularly widened in distal third (in dorsal view); with spiracular tubercles in basal third. Length of petiole 1.7–1.8 times its apical width, 1.7–2.0 times length of propodeum; apical width 1.5 times width at level of spiracles, 2.3 times its minimum width. Second tergite in basal half only with weakly sep-

arated laterotergites. Second suture absent. Median length of second and third tergites combined 1.2 times basal width of second tergite, 0.8–1.0 times their maximum width. Ovipositor straight. Ovipositor sheath 1.4–1.5 times as long as metasoma, 3.5–4.0 times as long as petiole, about twice as long as mesosoma, 0.7 times as long as body, almost as long as fore wing.

Sculpture and pubescence. Vertex finely transversely striate near ocelli, smooth at most part. Frons and face rugose-striate entirely. Temple vertically striate at most part. Mesoscutum densely and finely granulate, with distinct and undulate 4 striae medioposteriorly, with short rugae on lobes near notauli. Scutellum very finely granulate-coriaceous. Mesopleura completely coarsely rugose. Propodeum coarsely transversely striate, basolateral areas rugose-granulate, only granulate anteriorly, areas distinctly marginate, basal carina 0.5–0.6 times as long as fork of areola; areola large, petiole area short and distinctly separated from areola. Coxae and femora densely granulate, hind coxae additionally coarsely rugose-striate dorsally. Petiole coarsely rugose-striate. Second metasomal tergite finely rugose at short basal area. Rest parts of metasoma smooth. Mesoscutum with rather short semi-erect and more or less dense hairs along notauli and anteriorly. Mesopleura widely baremedially. Hairs of dorsal surface of hind tibia semi-erect, dense, short, their length 0.4–0.6 times maximum width of tibia.

Colour. Body dark reddish-brown, almost black partly, head, anterior part of pronotum, petiole and second tergite light reddish brown. Antennae yellowish brown, faintly infuscate medially, almost black apically. Palpi reddish brown. Legs reddish brown or dark reddish brown, femora darker, hind tibia yellowish basally. Fore wing distinctly infuscate, with more dark spot around first radial abscissa, paler basally, medially and apically. Pterostigma brown, pale yellow in basal third.

Host. *Buprestus novemmaculata* L. (Buprestidae) (Čapek *et al.* 1983)

Discussion. This species is in the *S. exarator* group and is closely similar to *S. erythrocephalus* Wesmael (Nixon 1943: couplet 2, page 197). The differences between these species are indicated in the following key:

- 2a. Mesopleura completely coarsely rugose. Propodeum with large lateral tubercles. Second radial abscissa longer than first radiomedial vein. Temple for the most part distinctly vertically striate *S. dentatus* Telenga
 –. Mesopleura mostly smooth. Propodeum without distinct lateral tubercles. Second radial abscissa shorter than first radiomedial vein. Temple almost entirely smooth
 *S. erythrocephalus* Wesmael

In Nixon's key, this species also runs to couplet 5 (Nixon 1943: page 198); the differences between this species and *S. curvicaudis* Ratzeburg are shown in the following key:

- 5a. Mesopleura completely coarsely rugose. Propodeum with large lateral tubercles. Second radial abscissa longer than first radiomedial vein. Temple for the most part distinctly vertically striate. Ovipositor straight *S. dentatus* Telenga
- Mesopleura smooth at most part. Propodeum without distinct lateral tubercles. Second radial abscissa shorter than first radiomedial vein. Temple almost entirely smooth. Ovipositor curved up *S. curvicaudis* Ratzeburg

Distribution. Slovakia, Russia (Yaroslavl' and Orenburg Provinces).

Spathius lehri Belokobylskij, 1998
(Figs 211–223)

Spathius lehri Belokobylskij, 1998: 99.

Material. Holotype: female, Russia, "Primorskii krai, 20 km VSV Partizanska, les, 9–10 VII 1996, Belokobylskij" (ZISP).

Description. Female. Body length 3.3 mm; fore wing length 2.3 mm. Head not depressed, its width 1.4 times median length. Maximum width of head at level of temple a little larger than width at level of eyes. Head behind eyes convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye equal to length of temple. Ocelli small, in triangle with base 1.4 times its sides; POL 1.8 times Od, 0.6 times OOL. Eye glabrous, 1.4 times as high as broad. Malar space height 0.5 times eye height and 0.8 times basal width of mandible. Face width 1.1 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression medium size, round, its width equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Vertex convex.

Antennae slender, filiform, more than 23-segmented (apical segments missing). Scape 1.7 times as long as maximum width. First flagellar segment almost 5 times as long as its apical width, 1.15 times as long as second segment. Subapical segments 2.3 times as long as wide.

Mesosoma. Length of mesosoma twice its height. Pronotal keel fine, its posterior branch shortly fused medially with posterior margin of pronotum; anterior branch very fine and situated near middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression narrow, shallow, incompletely marginate, entirely coarsely crenulate with fine coriaceous sculpture. Mesoscutum distinctly and gently roundly raised above pronotum. Notauli deep, complete, wide, coarsely crenulate with rugulosity. Prescutellar depression deep, wide, with 3 carinae, rugulose, 0.5 times as long as scutellum. Scutellum convex, with lateral carinae. Metanotum with pointed dorsal tooth.

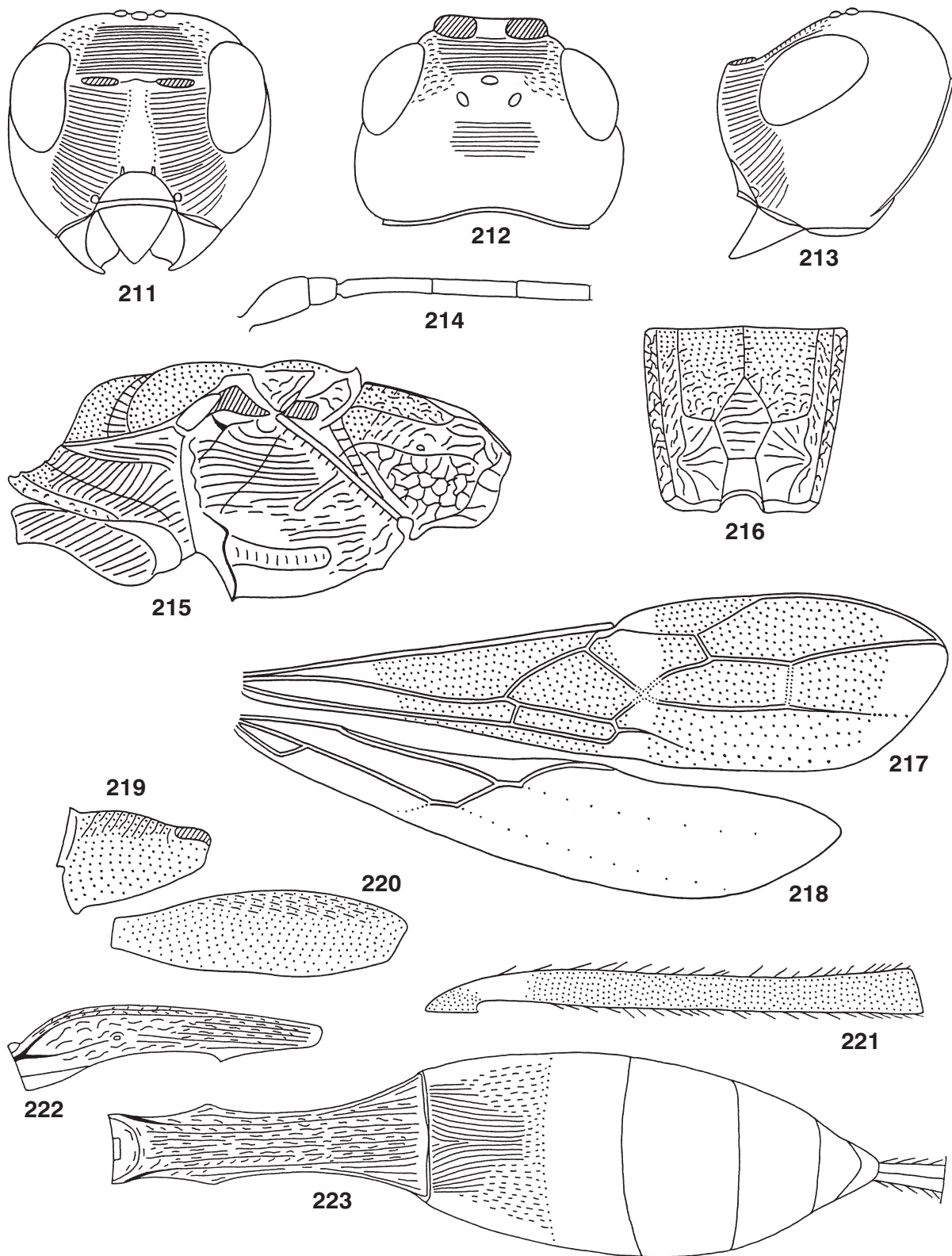
Subalar depression shallow, wide, densely longitudinally striate with rugulosity between striae. Sternauli rather deep, narrow, straight, crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum without lateral tubercles.

Wings. Fore wing 3.8 times as long as wide. Pterostigma 4.5 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.1 times as long as pterostigma. Second radial abscissa 3.3 times first abscissa and forming distinctly angle with it, 0.6 times the straight third abscissa, 1.1 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.3 times maximum width, 1.4 times length of brachial cell. Recurrent vein almost interstitial to first radiomedial vein. Distance from nervulus to basal vein 0.3 times nervulus length. Nervulus almost perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{5}$ of distal margin of brachial cell. Mediocubital vein weakly curved to anal vein. Hind wing 5.2 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.4 times second abscissa. Recurrent vein rather short, pigmented, straight, strongly antefurcal.

Legs. Fore tibia with rather dense slender numerous spines arranged in rather narrow stripe. Hind coxa rather short (its length almost 1.5 times maximum width), with small basoventral tooth and distinct corner. Hind femur elongate-oval, 3.5 times as long as wide. Hind tibia apically with 4 spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved in basal half and almost straight in apical half dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 2.6 times its apical width, almost twice length of propodeum; apical width 1.5 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture almost indistinct. Median length of second and third tergites combined 1.5 times basal width of second tergite, 0.9 times their maximum width. Ovipositor weakly curved up. Ovipositor sheath 0.9 times as long as body, 1.5 times as long as metasoma, 2.4 times as long as mesosoma, 1.2 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, very finely aciculate medially. Frons densely rugulose-striate. Face rather sparsely and distinctly striate with rugosity between striae. Temple entirely smooth. Mesoscutum densely and coarsely granulate, without rugae near notauli and laterally, with rather narrow rugose area in



Figures 211–223. *S. lehrri*: (211) head, frontal view, (212) head, dorsal view, (213) head, lateral view, (214) 5 basal segments of antenna, (215) mesosoma, lateral view, (216) propodeum, (217) fore wing, (218) hind wing, (219) hind coxa, (220) hind femur, (221) hind tibia, (222) petiole, lateral view, (223) metasoma, dorsal view.

medioposterior half. Scutellum entirely finely granulate. Mesopleura striate medially, rugulose posteriorly, shortly smooth anteriorly and below sternaulus. Propodeum with marginate areas, areola rather large and pentagonal; petiolate area short, distinctly separated from areola by high carina; propodeum entirely densely rugose-granulate, very densely granulate in basal half; basal carina 0.9 times as long as fork of areola. Hind coxae finely transversely striate dorsally, densely and finely granulate laterally, smooth below. Hind femora densely granulate with striation dorsally, coriaceous below. Petiole coarsely striate, with dense rugulosity between striae. Second tergite rugose basally, coriaceous on other part; third tergite finely coriaceous in basal $\frac{3}{4}$; rest of tergites smooth. Mesoscutum with sparse, short and semi-erect hairs along notauli and marginally. Mesopleura glabrous. Dorsal surface of hind tibia with short, rather sparse, semi-erect hairs, their length 0.4–0.6 times maximum width of tibia.

Colour. Head, most part of mesosoma and petiole reddish brown, sometimes lighter, mesonotum and rest part of metasoma dark reddish brown. Two basal segments of antenna brownish yellow, basal segments reddish brown, almost black at most part. Palpi reddish brown. Legs dark reddish brown, apices of all tibiae and all tarsi brownish yellow; all tibiae yellow basally at short distance. Ovipositor sheath brown at most part, black apically. Fore wing with 2 large and distinctly infuscate spots. Pterostigma dark brown, pale yellow in basal $\frac{1}{3}$.

Discussion. This species is in the *S. exarator* (Linnaeus) group and is rather closely similar to *S. exarator* (Linnaeus). The differences between these species are indicated in the following key:

1. Recurrent vein almost interstitial to first radiomedial vein. Mesopleura distinctly striate at most part. Palpi infuscate. Maximum width of head at level of temple a little larger than width at level of eyes. Ovipositor curved up *S. lehri* Belokobylskij
- . Recurrent vein distinctly postfureal behind first radiomedial vein. Mesopleura smooth at most part. Palpi pale. Maximum width of head at level of temple less than width at level of eyes. Ovipositor straight *S. exarator* (Linnaeus)

In Nixon's key, this species runs to couplet 5 (Nixon 1943: page 198); the differences between this species and *S. radzayanus* Ratzeburg are shown in the following key:

- 5a. Ovipositor sheath 1.5 times as long as metasoma. Petiole long, about twice as long as propodeum. Recurrent vein almost interstitial. Mesopleura striate at most part *S. lehri* Belokobylskij
- . Ovipositor sheath about as long as metasoma. Petiole short, less than 1.5 times as long as propodeum. Recurrent vein distinctly postfureal. Mesopleura smooth at most part *S. radzayanus* Ratzeburg

Distribution. Russia (Primorskii krai).

Spathius maderi Fahringer, 1930 stat. nov.
(Figs 224–233)

Spathius pedestris var. *maderi* Fahringer, 1930: 77; Shenefelt and Marsh 1976: 1411.

Spathius hirtus Hedqvist, 1976: 52 (syn. nov.); Belokobylskij and Tobias 1986: 28.

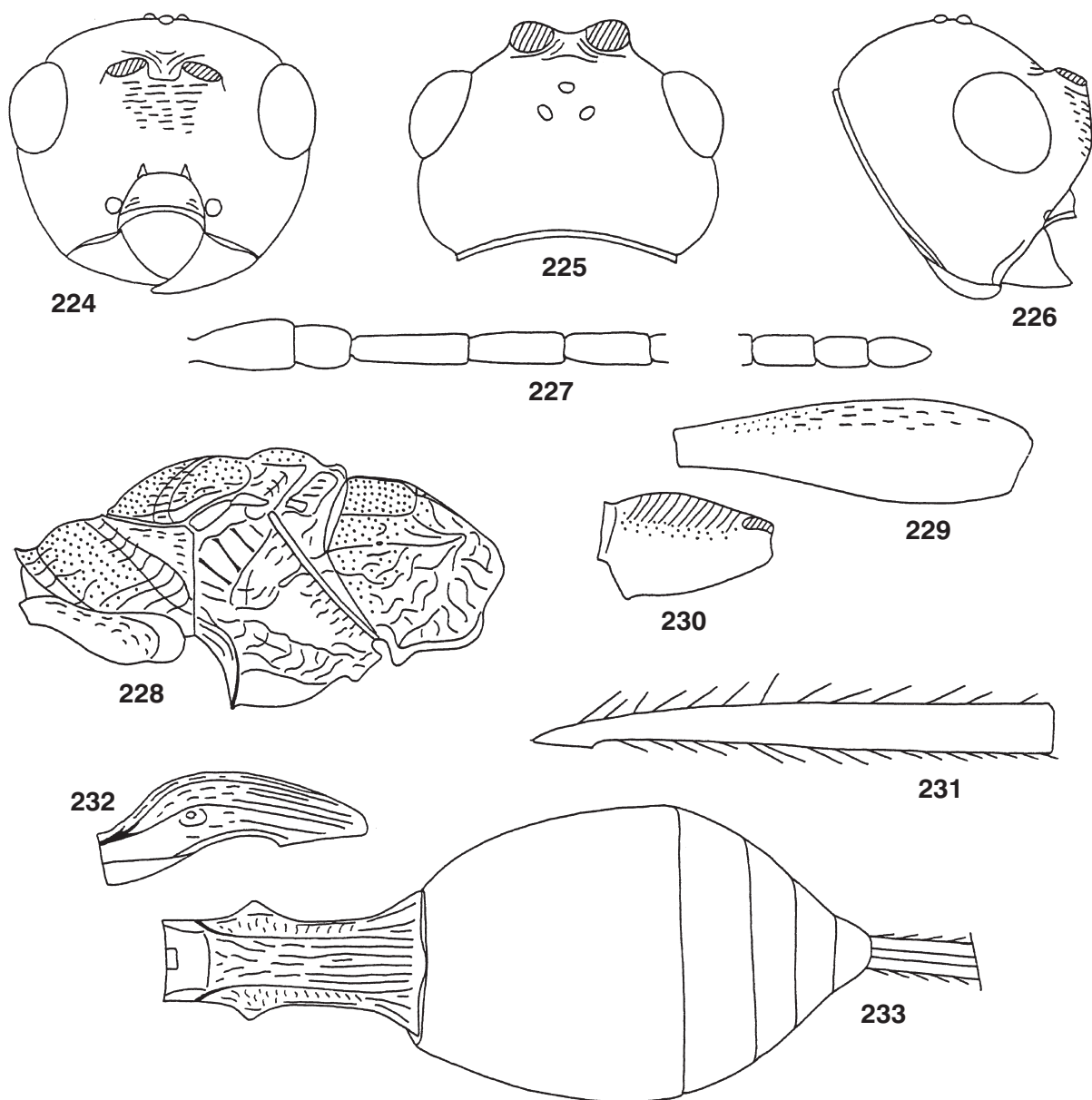
Material. Holotype of *S. pedestris* var. *maderi*: female, "Kruja, Alban. Mader", "sp. *pedestris* Wesm. ♀" (NHMW). Holotype of *S. hirtus*: female, "Spain, Estepona, 27/7 1959, S. Erlandsson", "Holotypus *Spathius hirtus* sp. n. ♀, K.-J. Hedqvist det. 1972", "463/83" (SMNH).

Additional material. Russia: 21 females, Sochi, Lasarevskoe, forest, 20, 30.IV, 5.V. 1973, 23, 27.V, 3, 4, 6, 14, 28.VI, 4.VII, 5.VIII. 1974, 27.IV, 1, 8, 9.V. 1975 (V. Tobias).

Description. Female. Body length 1.9–2.6 mm. Head width 1.2–1.4 times its median length, 1.8–2.0 times maximum width of mesoscutum. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye slightly less than length of temple. Ocelli very small, in almost equilateral triangle, POL 1.5–4.0 times Od, 0.2–0.3 times OOL. Eye small, almost round, glabrous, 1.1–1.2 times as high as broad. Malar space height 0.65–0.80 times height of eye and almost equal to basal width of mandible. Width of face 1.7–1.8 times eye height, 1.4–1.5 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.7–0.8 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina connected to hypostomal carina near mandible. Hypostomal flange wide. Vertex distinctly convex.

Antennae rather slender, filiform, 18–20-segmented, equal to or slightly shorter than body. Scape length 1.8–2.0 times its maximum width, 2.0–2.2 times length of pedicel. First flagellar segment 3.0–3.5 times as long as its apical width, almost equal to second segment. Penultimate segment 1.6–2.0 times as long as wide, 0.5 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically, but without process.

Mesosoma apterous, distinctly reduced, its length 1.6–1.9 times its height. Pronotal keel absent. Pronotum with fine transverse carina in anterior $\frac{1}{3}$. Pronotal lateral depression shallow, rather wide, not marginate, coarsely crenulate with dense pranalation posteriorly. Mesoscutum weakly and roundly raised above pronotum. Mesomesosoma rather small, maximum length of mesopleura nearly equal to maximum length of propleura. Notauli deep, wide, complete, coarsely and sparsely crenulate. Prescutellar depression deep, rather long, smooth or finely granulate, with median carina, 0.35–0.40 times as long as scutellum. Scutellum small, convex, with lateral carinae. Metanotum with rather short, flat and obtuse tooth. Subalar depression deep, wide, with median carina, finely granulate below. Sternauli long, wide, shallow, oblique, coarsely crenulate, running along entire length of lower



Figures 224–233. *S. maderi*: (224) head, frontal view, (225) head, dorsal view, (226) head, lateral view, (227) basal and apical segments of antenna, (228) mesosoma, lateral view, (229) hind femur, (230) hind coxa, (231) hind tibia, (232) petiole, lateral view, (233) metasoma, dorsal view.

part of mesopleura. Postpectal carina absent Propodeum roundly convex, with distinct and rather pointed lateral tubercles. Wings as more or less short scale, with rather long hairs.

Legs. Fore tibia with small rather numerous spines arranged almost in one row. Hind coxa rather short (its length 1.5 times maximum width), with small basoventral tooth and rather distinct corner. Hind femur subclavate, 3.5–4.0 times as long as wide. Hind tibia without apical spines. Hind tarsus 0.8–0.9 times as long as hind tibia. Hind basitarsus about 0.7 times second-fifth segments combined. Second tarsal segment about 0.4 times

as long as basitarsus, 0.8–0.9 times as long as fifth segment (without pretarsus).

Metasoma 0.9–1.0 times as long as head and mesosoma combined. Petiole (lateral view) curved ventrally, distinctly and regularly curved dorsally, thickened in basal half; widened in distal quarter (in dorsal view), with large spiracular tubercles in basal third. Length of petiole 1.4–1.7 times its apical width, 1.4–1.5 times length of propodeum; apical width of petiole 1.2–1.3 times width at level of spiracular tubercles. Second and third tergites without separated laterotergites. Second suture absent. Median length of second and third tergites com-

bined 1.4–1.6 times basal width of second tergite, 0.9 times their maximum width. Ovipositor straight. Ovipositor sheath 0.7–1.0 times as long as metasoma, 2.3–2.5 times as long as petiole, 1.0–1.3 times as long as mesosoma.

Sculpture and pubescence. Head smooth, face in upper half finely rugulose medially. Pro- and metapleura granulate-rugulose. Mesoscutum almost smooth or very finely granulate, median lobe densely and finely granulate with several rugae. Scutellum smooth. Mesopleura coarsely rugose, medially on rather narrow area smooth or finely granulate. Propodeum granulate-rugose, sometimes almost smooth basally, only rugose in posterior $\frac{1}{3}$; areas weakly marginate, areola small, rombiform, petiolate area usually indistinct; basal carina 1.7–2.3 times as long as fork of areola. Hind coxa finely granulate, additionally rugose-striate dorsally. Hind femur finely granulate, sometimes ventrally almost smooth. Petiole densely striate with rugosity between striae, rugose in basal $\frac{1}{2}$. Rest of tergites smooth. Mesoscutum with long, rather sparse and almost erect hairs. Mesopleura bare at most part. Dorsal surface of hind tibia with rather short dense semi-erect hairs, their length 0.5–0.8 times maximum width of tibia.

Colour. Body light brown or light reddish brown. Head and sometimes gaster darker. Antennae (dark) reddish brown, in basal $\frac{1}{4}$ – $\frac{1}{2}$ light brown or light reddish brown, apical 1–5 segments yellow. Palpi yellow. Legs completely light brown or brownish yellow.

Discussion. This apterous species runs to the *S. exarator* (Linnaeus) group (Nixon 1943: couplet 8, page 192), except the propodeum is not so strongly convex and lies below the level of the scutellum. The differences between the three apterous Palaearctic species are indicated in the following key:

1. Mesoscutum without notauli and prescutellar depression; scutellum indistinct. Malar space height distinctly larger than height of eye. Promesosoma, meso- and metapleura distinctly coarsely striate. Petiole strongly thickened in distal $\frac{2}{3}$ (lateral view). Length of body 3.2–3.6 mm *S. canariensis* Hedqvist
- Mesoscutum with distinct notauli, prescutellar depression and scutellum. Malar space height distinctly less than height of eye. Promesosoma, meso- and metapleura granulate-rugulose, sometimes almost smooth partly. Petiole thickened in median part (lateral view) 2
2. Propodeum weakly convex, with distinct and pointed lateral protuberances and with distinct areas. Scutellum roundly convex. Metanotum with long and pointed tooth. Ovipositor sheath usually shorter than metasoma. Body almost completely with long and erect hairs. Length of body 1.9–2.6 mm *S. maderi* Fahringer
- Propodeum strongly convex, without protuberances and areas or areas indistinct. Scutellum pointedly convex. Metanotum without or with very short tooth. Ovipositor sheath usually longer than metasoma. Body almost completely with short and semi-erect hairs. Length of body 2.0–3.3 mm *S. pedestris* Wesmäl

Distribution. Spain, Albania, Russia (south of the European part).

Spathius phymatodis Fischer, 1966
(Figs 234–245)

Spathius phymatodis Fischer, 1966a: 219; Tobias 1971: 197; Shenefelt and Marsh 1976: 1413; Belokobylskij and Tobias 1986: 29; Belokobylskij 1998: 100.

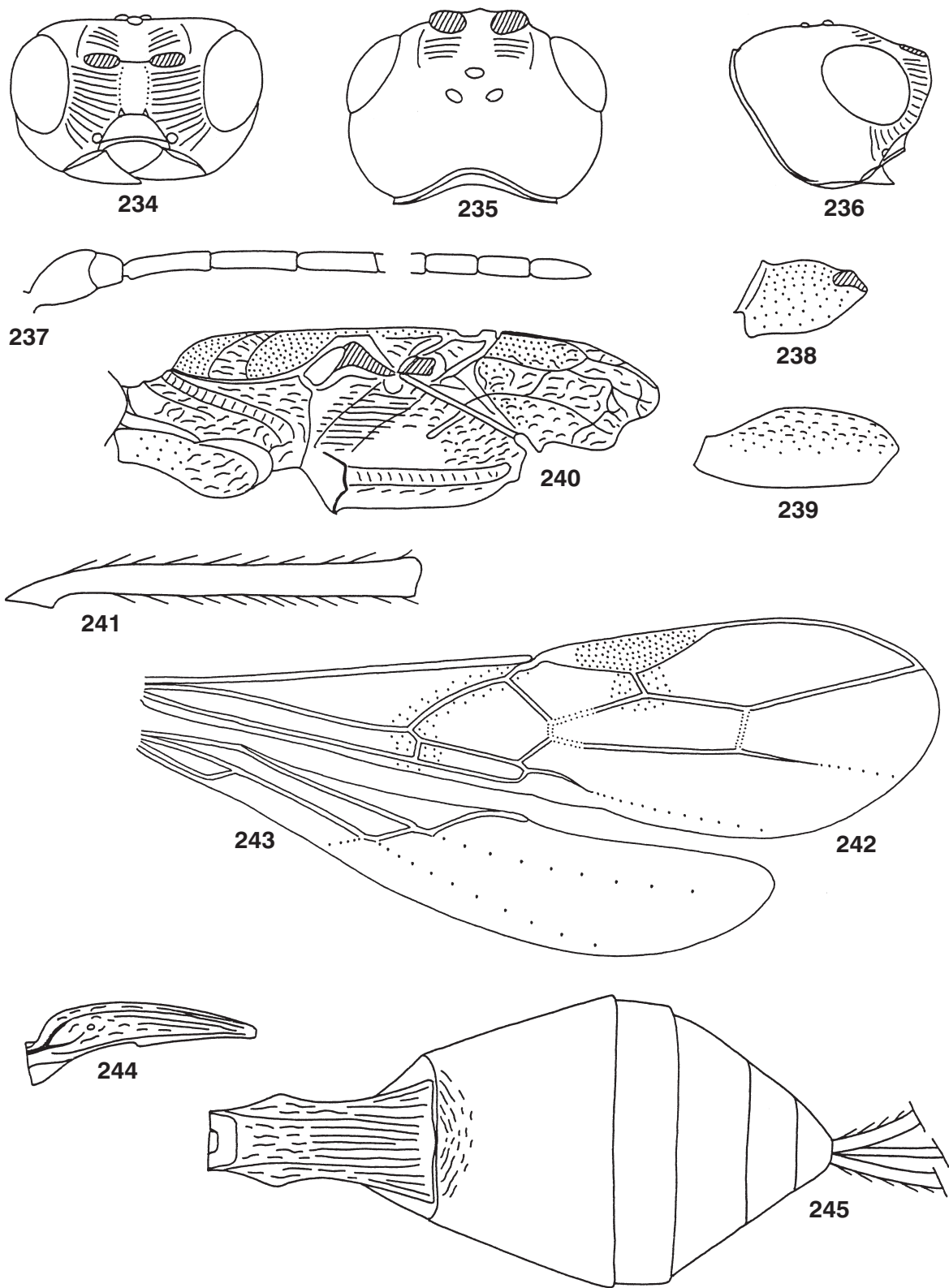
Material. Holotype: female, France, “Avignen (Vse) Elevage eclos, 18.IV.1964”, “Issu de sarments de vigne habites par larves de *Phymatodes*”, “Holotype”, “*Spathius phymatodis* n. sp., det. Fischer” (MHNG).

Additional material. Russia: 1 female, “П’menskii zapoved.[nik], Chelyabinskoi obl.[asti], 14.VII.[1]958, Tobias” (ZISP).

Description. Female. Body length 2.2–2.4 mm; fore wing length 1.9 mm. Head distinctly depressed, its width 1.3 times median length, 1.4 times maximum height. Head behind eyes almost parallel-sided in anterior half, roundly narrowed in posterior half. Transverse diameter of eye about equal to length of temple. Ocelli small, in triangle with base 1.2 times its sides; POL 1.5–1.7 times Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and 0.6 times basal width of mandible. Face width 1.2 times eye height and 1.4–1.5 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.7 times distance from edge of depression to eye, 0.3 times width of face. Occipital carina shortly absent near mandible, not fused with hypostomal carina, complete dorsally. Hypostomal flange very narrow. Vertex flat.

Antennae slender, filiform, 22–24-segmented, almost as long as body. Scape 1.6 times as long as wide. First flagellar segment 4.5–4.8 times as long as its apical width, as long as second segment. Penultimate segment 2.5 times as long as wide, 0.6 times as long as first segment, 0.8 times as long as apical segment; the latter weakly pointed apically.

Mesosoma distinctly depressed. Length of mesosoma 2.5–2.8 times its height. Pronotal keel distinct, its posterior branch shortly fused medially with posterior margin of pronotum, anterior branch fine and situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather narrow, rather shallow, indistinctly marginate, finely crenulate-rugulose. Mesoscutum weakly and gently-roundly raised above pronotum. Notauli rather deep anteriorly, shallow posteriorly, complete, narrow, finely and rather densely crenulate-rugulose. Prescutellar depression shallow, rather wide, with 3 carinae, rugulose-granulate, 0.4 times as long as scutellum. Scutellum flat and with fine lateral carinae. Metanotum with very short obtuse tooth. Subalar depression shallow, wide,



Figures 234–245. *S. phymatodis*: (234) head, frontal view, (235) head, dorsal view, (236) head, lateral view, (237) basal and apical segments of antenna, (238) hind coxa, (239) hind femur, (240) mesosoma, lateral view, (241) hind tibia, (242) fore wing, (243) hind wing, (244) petiole, lateral view, (245) metasoma, dorsal view.

densely rugulose-striate. Sternauli narrow, rather shallow, straight, finely rugulose-coriaceous, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and wide. Propodeum without lateral tubercles.

Wings. Fore wing 3.6 times as long as wide. Pterostigma 4.5 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.2 times as long as pterostigma. Second radial abscissa 3.8 times first abscissa and forming distinctly obtuse angle with it, 0.6 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 3.6 times maximum width, almost twice length of brachial cell. Recurrent vein 2.3 times second abscissa of medial vein. Distance from nervulus to basal vein 0.7 times nervulus length. Nervulus perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{2}{3}$ of distal margin of brachial cell. Mediocubital vein very weakly curved to anal vein. Hind wing 5.0 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein rather short, unsclerotized, weakly curved toward base of wing, antefurcal.

Legs. Fore tibia with dense, rather thick numerous spines arranged in rather wide stripe. Hind coxa short (its length 1.5 times maximum width), with small basoventral tooth and corner. Hind femur short, elongate oval, 2.6–3.0 times as long as wide. Hind tibia apically with 3 spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) curved ventrally, distinctly and more or less regularly curved in basal $\frac{1}{4}$, almost straight in apical $\frac{3}{4}$ dorsally, distinctly thickened in basal half; widened in apical $\frac{1}{3}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 1.8 times its apical width, 1.6 times length of propodeum; apical width 1.5 times width at level of spiracles. Second tergite with separate laterotergite in basal half. Second suture absent. Median length of second and third tergites combined 1.1 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.5 times as long as metasoma, 1.4 times as long as petiole, 0.7 times as long as mesosoma, 0.3 times as long as fore wing.

Sculpture and pubescence. Vertex almost smooth. Frons very finely transversely striate. Face at most part densely transversely striate with granulation between striae. Temple smooth. Mesoscutum densely granulate, median lobe finely rugulose also, without rugae near notauli, with 2 fine and convergent carinae medioposteriorly, widely rugose-reticulate on medioposterior half.

Scutellum densely and finely granulate-coriaceous. Mesopleura striate-rugulose in upper half, widely smooth in below half, with parts of fine rugulosity anteriorly and posteriorly. Propodeum with finely marginate areas, areola rather short and narrow, pentagonal, petiolate area short and finely separated from areola; propodeum densely rugose-reticulate, basolateral areas densely granulate at most part; basal carina 1.6 times as long as fork of areola. Hind coxae finely and densely granulate-coriaceous in upper half, finely transversely striate dorsally, almost smooth below. Hind femora finely and densely striate with fine granulation dorsally, smooth in below half. Petiole densely rugulose-reticulate in basal half, rugulose-striate in apical half. Second tergite finely striate-rugulose basally, very finely coriaceous or smooth on other part. Rest of tergites smooth. Mesoscutum with sparse, short, semi-erect hairs along notauli and marginally. Mesopleura bare at most part. Dorsal surface of hind tibia with short, rather dense semi-erect hairs, their length 0.4–0.7 times maximum width of tibia.

Colour. Body reddish brown, darker dorsally, head below light reddish brown, propleura yellowish brown. Four basal segments of antenna yellow, other segments light reddish brown to reddish brown, apical segments almost black. Palpi yellowish brown. Legs yellowish brown, hind tibia pale basally. Ovipositor sheath black, brown basally. Fore wing very faintly infuscate, with distinct narrow infuscation along basal and first abscissa of radial veins. Pterostigma brown, yellow in basal $\frac{1}{3}$.

Host. *Phymatodes fasciatus* Vill. (Cerambycidae).

Discussion. This species is in the *S. exarator* (Linnaeus) group and distinctly differs from all species of this group because of its strongly depressed body (including the head). More or less depressed mesosomal forms together with normal ones are present in some species in the *S. exarator* group [*S. rubidus* (Rossi), *S. generosus* Wilkinson, *S. radzayanus* Ratzeburg, etc.] and it may be connected with structure and shape of the wood tunnels of the hosts. But in *S. phymatodis* (as well as in *S. planus* Belokobylskij) the depressed shape is developed not only on the mesosoma (as in other species), but also on the head. In Nixon's key, *S. phymatodis* runs to couplet 6 (page 198) and is similar to *S. brevicaudis* Ratzeburg and *S. rubidus* (Rossi); the differences between these species are indicated in the following key:

- 6a. Body (including head) distinctly depressed; mesosoma 2.5–2.8 times as long as height. Mesoscutum weakly and gradually raised above pronotum. Second tergite often sculptured only basally *S. phymatodis* Fischer
 –. Body not depressed; mesosoma 1.8–2.0 times as long as height, rarely mesosoma more or less depressed, 2.2–2.3 times as long as height. Mesoscutum highly and almost perpendicularly or roundly raised above pronotum. Second tergite often sculptured entirely
 *S. rubidus* (Rossi) and *S. brevicaudis* Ratzeburg

The differences between *S. phymatodis* Fischer and *S. planus* Belokobylskij are indicated in the redescription of the second species.

Distribution. France, Italy, Czech Republic, Slovakia, Hungary, Ukraine, Russia (European part, Urals, East Siberia, Far East), Mongolia, Korea.

Spathius planus Belokobylskij, 1998
(Figs 246–258)

Spathius planus Belokobylskij, 1998: 100.

Material. Holotype: female, Russia, "Primorskii krai, 10 km S Chuguevki, les, 30 VI 1979, Belokobylskij" (ZISP).

Paratypes. 24 females from Primorskii krai and Kuril Is, 1 female from Japan (Honshu).

Description. Female. Body length 2.0–4.0 mm; fore wing length 1.6–2.8 mm. Head rather distinctly depressed, its width 1.4–1.5 times median length. Head behind eyes almost parallel-sided in anterior half, roundly narrowed in posterior half. Transverse diameter of eye almost equal to length of temple. Ocelli medium sized, in triangle with base 1.2–1.3 times its sides; POL 1.3–1.6 times Od, about 0.4 times OOL. Eye glabrous, 1.3–1.4 times as high as broad. Malar space height 0.3–0.4 times eye height and 0.6–0.7 times basal width of mandible. Face width 1.1–1.2 times eye height and 1.4–1.5 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression medium size, round, its width almost equal to distance from edge of depression to eye, about 0.4 times width of face. Occipital carina rather shortly absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Vertex almost flat.

Antennae slender, filiform, 27–31-segmented, 1.2 times as long as body. Scape 1.5–1.8 times as long as maximum width. First flagellar segment 4.0–4.5 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segments 2.5–3.0 times as long as wide, 0.5–0.6 times as long as first flagellar segment, 0.9 times as long as apical segment; the latter weakly pointed apically.

Mesosoma depressed. Length of mesosoma 2.8–3.3 times its height. Pronotal keel very fine, its posterior branch shortly separated or shortly fused medially with posterior margin of pronotum; anterior branch fine and situated near middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather narrow, deep, indistinctly marginate, almost entirely rugose-crenulate. Mesoscutum weakly and gently-roundly raised above pronotum. Notauli deep anteriorly, very shallow posteriorly, complete, rather wide, coarsely rugose-crenulate. Prescutellar depression shallow, short, with median carina, rugulose, 0.25 times as long as scutellum. Scutellum flat, with lateral carinae.

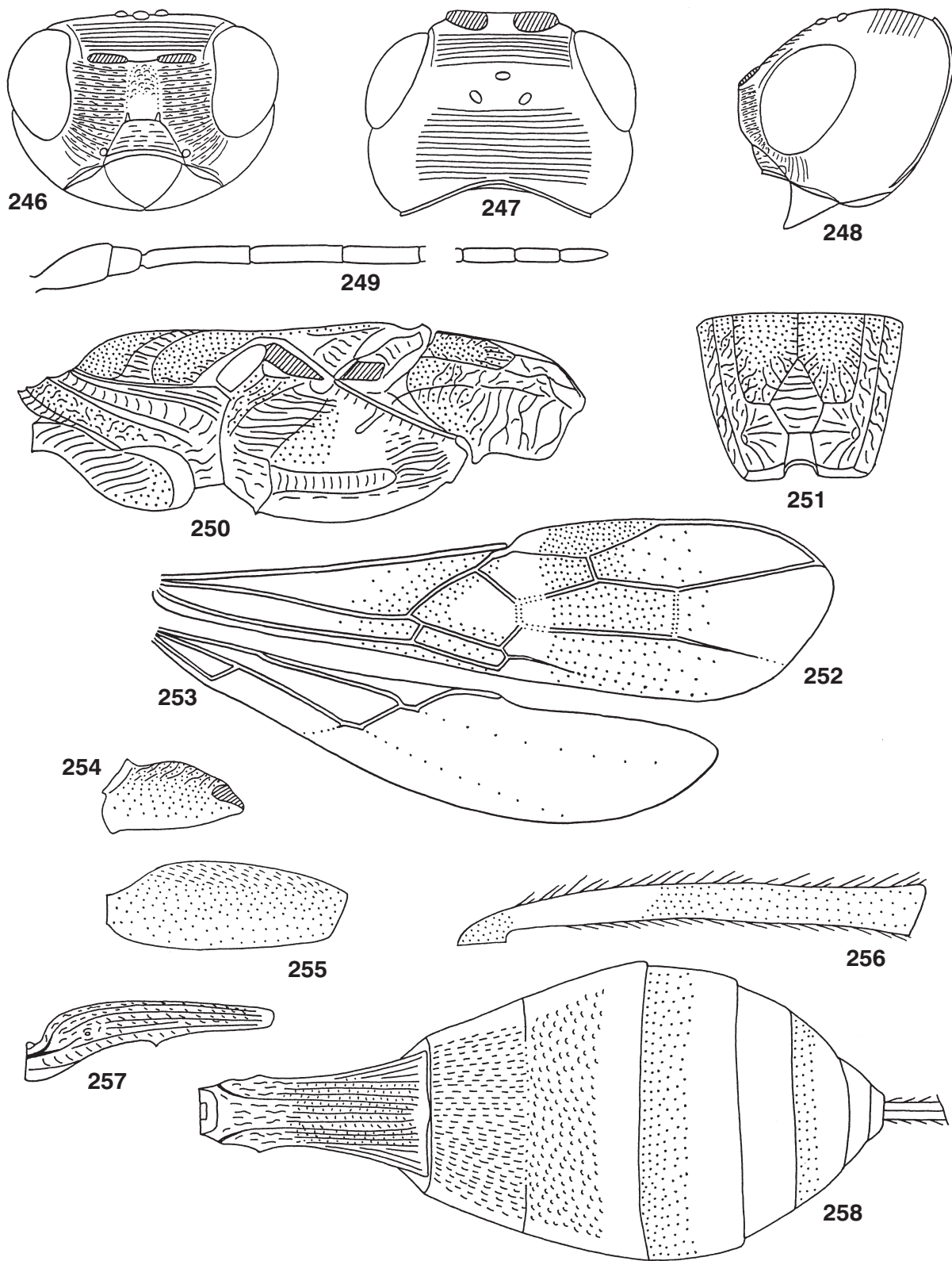
Metanotum with small or very small tooth. Subalar depression shallow, wide, densely and distinctly rugulose-striate. Sternauli rather shallow, narrow, straight or weakly curved, crenulate and with fine granulation, running along anterior $\frac{1}{2}$ – $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum without lateral tubercles.

Wings. Fore wing 3.3–3.6 times as long as wide. Pterostigma 4.0–4.3 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.1–1.2 times as long as pterostigma. Second radial abscissa 3.0–3.6 times first abscissa and forming distinctly angle with it, 0.6–0.7 times third abscissa, 1.1–1.3 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.3–3.5 times maximum width, 1.7–1.8 times length of wide brachial cell. Recurrent vein 1.5–1.7 times second abscissa of medial vein. Distance from nervulus to basal vein 0.3–0.6 times nervulus length. Nervulus almost perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{5}$ – $\frac{1}{4}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein. Hind wing 5.0–5.2 times as long as wide. First costal abscissa 0.60–0.65 times second abscissa. First abscissa of mediocubital vein 0.55–0.60 times second abscissa. Recurrent vein rather short, unsclerotized, oblique, distinctly antefurcal.

Legs. Fore tibia with dense slender numerous spines arranged in narrow stripe. Hind coxa rather long (its length 1.7–1.8 times maximum width), with small basoventral tooth and distinct corner. Hind femur elongately oval, 2.7–3.0 times as long as wide. Hind tibia apically with 3–5 spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.4–1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, slightly and regularly curved in basal half and almost straight in apical half dorsally, thickened in basal $\frac{1}{3}$; distinctly widened in apical half (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 1.8–2.0 times its apical width, 1.8–2.0 times length of propodeum; apical width 1.3–1.6 times width at level of spiracles. Second tergite in basal $\frac{1}{2}$ – $\frac{2}{3}$ with separate laterotergites. Second suture almost indistinct. Median length of second and third tergites combined 1.1–1.2 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.7–0.9 times as long as metasoma, 2.0–2.8 times as long as petiole, 0.9–1.3 times as long as mesosoma, 0.45–0.60 times as long as fore wing.

Sculpture and pubescence. Vertex almost entirely finely transversely sometimes interruptedly rugulose-striate, rarely entirely smooth. Frons almost entirely finely transversely striate. Face coarsely rugose-striate,



Figures 246–258. *S. planus*: (246) head, frontal view, (247) head, dorsal view, (248) head, lateral view, (249) basal and apical segments of antenna, (250) mesosoma, lateral view, (251) propodeum, (252) fore wing, (253) hind wing, (254) hind coxa, (255) hind femur, (256) hind tibia, (257) petiole, lateral view, (258) metasoma, dorsal view.

smooth on narrow median part. Temple finely vertically striate or rugulose-striate in upper $\frac{1}{2}$ – $\frac{3}{4}$, sometimes in posterior half only, almost smooth on rest part. Mesoscutum densely granulate, without rugae near notauli and laterally, undulately striate on wide or rather narrow median area in posterior $\frac{2}{3}$ – $\frac{3}{4}$. Scutellum densely granulate, sometimes with fine semi-circular striation partly. Mesopleura often rugulose at most median part, almost smooth near sternauli or sometimes in below half. Propodeum with marginate areas, areola rather small and almost pentagonal, petiolate area short, separated from areola by carina; propodeum densely granulate-rugose, only granulate in anterior $\frac{1}{3}$; basal carina 1.0–1.7 times as long as fork of areola. Hind coxae densely granulate with rugosity dorsally. Hind femora densely granulate-coriaceous, finely granulate below. Petiole densely and coarsely rugose-striate, sometimes rugosity very distinct. Second tergite densely and almost entirely reticulate-striate; third tergite finely reticulate-coriaceous in basal half; fourth tergite finely coriaceous in basal half; rest parts of tergites smooth. Mesoscutum with sparse, short and semi-erect hairs along notauli and marginally. Mesopleura widely bare. Dorsal surface of hind tibia with short dense semi-erect hairs, their length 0.4–0.7 times maximum width of tibia.

Colour. Body reddish brown or dark reddish brown, head and sometimes metasoma medially light reddish brown. Two basal segments of antenna brownish yellow, rest segments light reddish brown or reddish brown to black apically. Palpi pale yellow. Legs brownish yellow, hind femur reddish brown; hind tibia light reddish brown, yellow in basal $\frac{1}{3}$. Ovipositor sheath yellowish brown in basal half, reddish brown to black in apical half. Fore wing more or less infuscate, sometimes with two large more distinctly infuscate spots. Pterostigma brown, yellow in basal $\frac{1}{3}$.

Host. *Scolytus japonicus* Chapuis (Scolytidae).

Discussion. This species is in the *S. exarator* (Linnaeus) group and is closely similar to *S. phymatodis* Fischer. The differences between these species are indicated in the following key:

1. Ovipositor sheath 0.7–0.8 times as long as mesosoma, 0.33–0.37 (rarely 0.4) times as long as fore wing *S. phymatodis* Fischer
- . Ovipositor sheath 1.0–1.3 times as long as mesosoma, 0.45–0.60 times as long as fore wing *S. planus* Belokobylskij

In Nixon's key, this species runs to the couplet 4 (page 198); the differences between *S. planus* Belokobylskij, *S. generosus* Wilkinson and *S. exarator* (Linnaeus) are indicated in the following key:

- 4a. Mesosoma depressed, its length about 3.0 times its height. Ovipositor sheaths shorter, about 0.7 times as long as metasoma. Vertex often finely rugose-striate. Median areas of mesopleura sculptured at most part *S. planus* Belokobylskij

- . Mesosoma not depressed, its length about twice its height. Ovipositor sheaths longer, not shorter than metasoma. Vertex often smooth. Median areas of mesopleura smooth at most part *S. exarator* (Linnaeus) and *S. generosus* Wilkinson

Distribution. Russia (Primorskii Krai, Kuril Is), Japan (Honshu).

Group of *Spathius fasciatus* Walker

Spathius baium Belokobylskij, 1998
(Figs 259–271)

Spathius baium Belokobylskij, 1998: 93.

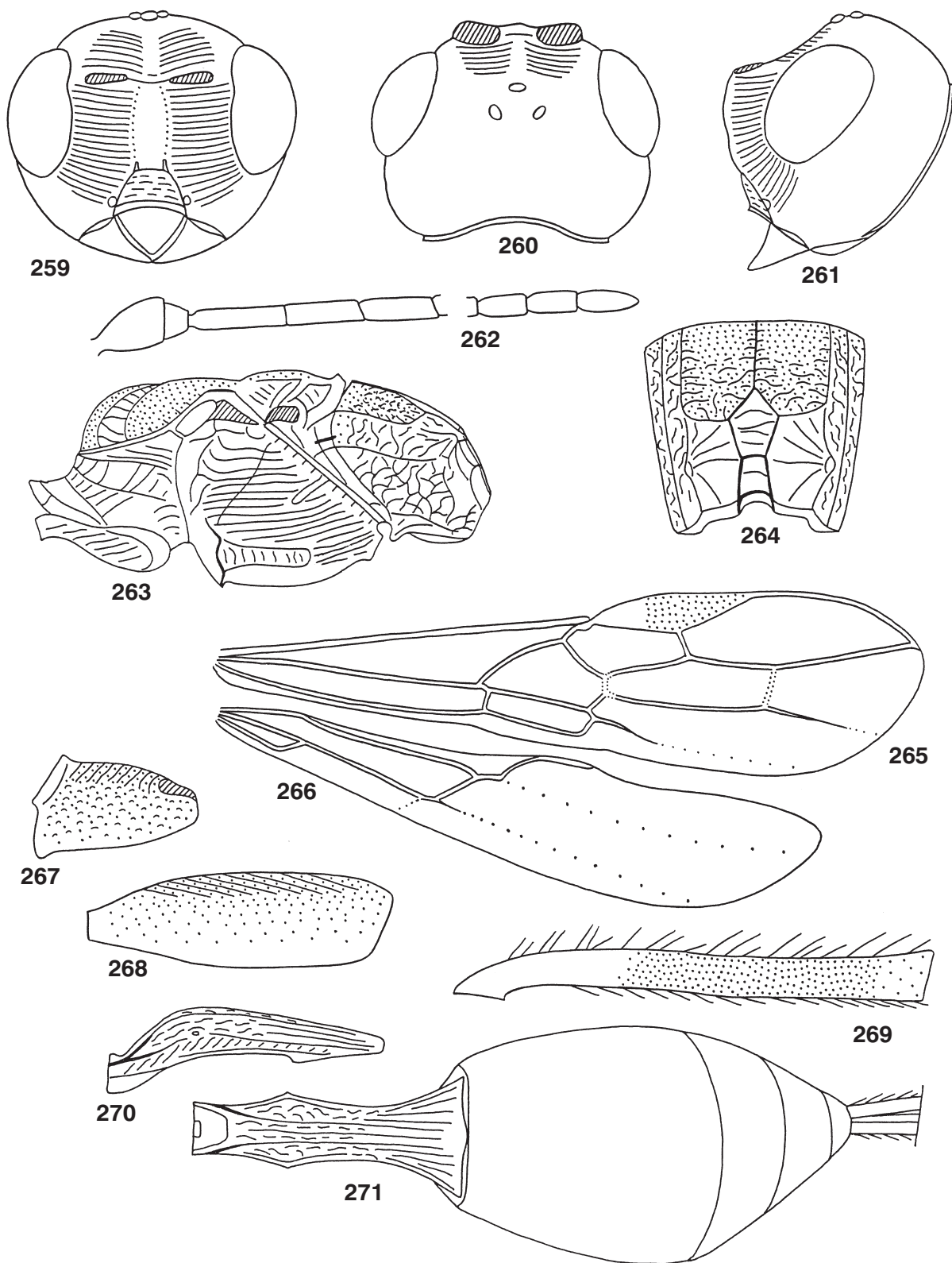
Material. Holotype: female, "Kunashir, Alekhino, smesh.[annyi] les, 31 VII 1981, Belokobylskij" (ZISP).

Paratypes. Russia: 1 female, "Primorskii krai, zap.[ovednik] "Kedrovaia pad", smesh.[annyi] les, 21 VIII 1979, Belokobylskij" (ZISP); 1 female, "Primorskii krai, 5 km Z Anisimovki, les, poliany, 6–9.08.1993, Belokobylskij" (ZISP).

Description. Female. Body length 2.9–3.5 mm; fore wing length 2.2–2.5 mm. Head not depressed, its width 1.4–1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.3–1.5 times length of temple. Ocelli rather small, in almost equilateral triangle; POL 1.3 times Od, 0.5 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4 times eye height and 0.6–0.8 times basal width of mandible. Face width 1.1 times as long as eye height and 1.3 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange very narrow. Vertex convex.

Antennae rather thick, filiform, 24-segmented, about 0.8 times as long as body. Scape 1.4 times as long as wide. First flagellar segment 3.5 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 2.3 times as long as wide, 0.6 times as long as first segment, 0.9 times as long as apical segment; the latter weakly pointed apically and without apical spine.

Mesosoma. Length of mesosoma about twice its height. Pronotal keel distinct, its posterior branch rather shortly fused with posterior margin of pronotum, anterior branch indistinct. Pronotum with distinct transverse carina in apical $\frac{1}{5}$. Pronotal lateral depression wide, rather deep, marginate, distinctly crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, complete, densely crenulate. Prescutellar depression long, rather deep, with median carina, sparsely rugulose, 0.4 times as long as scutel-



Figures 259–271. *S. baiun*: (259) head, frontal view, (260) head, dorsal view, (261) head, lateral view, (262) basal and apical segments of antenna, (263) mesosoma, lateral view, (264) propodeum, (265) fore wing, (266) hind wing, (267) hind coxa, (268) hind femur, (269) hind tibia, (270) petiole, lateral view, (271) metasoma, dorsal view.

lum. Scutellum convex. Subalar depression shallow, wide, densely longitudinally striate. Sternauli deep, straight, densely crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metanotum with distinct pointed tooth. Metapleural flange narrow and short. Propodeum with small wide obtuse lateral tubercles.

Wings. Fore wing 3.8 times as long as wide. Pterostigma 4.2 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.1 times as long as pterostigma. Second radial abscissa 3.0–3.3 times first abscissa and forming distinct obtuse angle with it, 0.5–0.6 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.0–3.3 times maximum width, 1.5–1.6 times length of wide brachial cell. Recurrent vein 1.8–2.7 times second abscissa of medial vein. Nervulus oblique towards apex of wing, weakly postfurcal. Distance from nervulus to basal vein about 0.2 times nervulus length. Parallel vein not interstitial, arising from anterior 1/3 of brachial vein. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 5.3 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.6–0.7 times second abscissa. Recurrent vein strongly oblique, unsclerotized at most part, weakly antefurcal.

Legs. Fore tibia with numerous, small, rather dense spines arranged in rather wide stripe. Hind coxa medium size (its length 1.8 times maximum width), with basoventral tooth and corner. Hind femur elongate-oval, 3.0–3.2 times as long as wide. Hind tibia apically with 3–4 slender spines on outer margin. Hind tarsus 0.9 times as long as hind tibia. Tarsal segments thick. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, 1.1 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) slightly and regularly curved ventrally, dorsally distinctly and regularly curved in basal half and almost straight in apical half, distinctly thickened in basal third; widened in basal 1/3 and in apical 1/4 (dorsal view), with distinct spiracular tubercles in basal 1/3. Length of petiole 2.4–2.6 times its apical width, 1.7–1.8 times length of propodeum; apical width 1.4 times width at level of spiracles, almost twice its minimum width. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost equal to basal width of second tergite, 0.6 times their maximum width. Ovipositor straight. Ovipositor sheath 1.0–1.2 times as long as metasoma, 2.5–3.0 times as long as petiole, 1.4–1.7 times as long as mesosoma, 0.7–0.8 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons finely and densely striate. Face densely transversely striate, smooth medially. Mesoscutum

densely granulate, with short rugulosity along notauli, rugose on narrow medioposterior half. Scutellum very finely granulate. Mesopleura longitudinally striate, finely striate above sternauli at short distance, and almost smooth below sternauli. Metapleura rugose-reticulate. Propodeum with distinctly marginate areas, basolateral areas entirely and densely rugulose-granulate, rest of propodeum sparsely rugose; areola small and narrow, pentagonal; petiolate area short, widened distally, distinctly separated from areola; basal carina long, 1.7–3.0 times as long as fork of areola. Hind coxae densely striate with granulation dorsally, densely granulate laterally. Hind femora densely and finely striate-granulate, very finely granulate laterally. Petiole coarsely rugose in basal 2/3, rugulose-striate in apical 1/3. Rest of tergites smooth. Mesoscutum with sparse, rather long, semi-erect hairs along notauli and marginally. Hairs of dorsal surface of hind tibia medium length, rather sparse, semi-erect, their length 0.6–0.9 times maximum width of tibia.

Colour. Head brownish yellow. Mesosoma light reddish brown. Metasoma reddish brown with dark transverse stripes. Antenna yellow to brownish yellow in basal 2/3, brown to dark brown in apical 1/3. Palpi pale yellow. Legs yellow, femora and median parts of tibiae light reddish brown, basal part of all tibiae pale yellow. Ovipositor sheath light reddish brown in basal 2/3, brown to dark brown in apical 1/3. Fore wing faintly infusate. Pterostigma brown, pale yellow in basal 1/3.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. fasciatus* Walker (Nixon 1943: couplet 24a, page 207); the differences between these species are indicated in the following key:

- 24b. Antennal segments wide and short, first flagellar segment 3.5–4.0 times as long as apical width; penultimate segment 2.0–2.2 times as long as wide. Mesoscutum rather obliquely-roundly raised above pronotum. Basolateral areas of propodeum entirely rugulose-reticulate. Mesopleura longitudinally striate at most part *S. baitum* Belokobylskij
- . Antennal segments long and slender, first flagellar segment 5.0–6.0 times as long as apical width; penultimate segment 2.8–3.5 times as long as wide. Mesoscutum almost perpendicularly raised above pronotum. Basolateral areas of propodeum granulate at most part. Mesopleura smooth at most part *S. fasciatus* Walker

This species is also similar to *S. neleus* Nixon (Nixon 1943: couplet 25, page 207) because of the same coloration of the hind tibia. The differences between these species are indicated in the following key:

- 25a. Antennal segments wide and short. Mesoscutum without distinct rugae along notauli and laterally. Basal carina of propodeum long, 1.7–3.0 times as long as fork of areola. Basolateral areas of propodeum entirely sculptured. Recurrent vein strongly postfurcal. Mesopleura striate at most part *S. baitum* Belokobylskij

-. Antennal segments narrow and long. Mesoscutum with distinct rugae along notauli and laterally. Basal carina of propodeum very short. Basolateral areas of propodeum almost smooth. Recurrent vein almost interstitial. Mesopleura smooth at most part *S. neleus* Nixon

Distribution. Russia (Primorskii krai, Kuril Is.).

Spathius clavifemur Belokobylskij, 1998
(Figs 272–284)

Spathius clavifemur Belokobylskij, 1998: 87.

Material. Holotype: female, Russia, “Primorskii krai, 20 km YuV Ussuriyska, na svet, 31 07 1991, Belokobylskij” (ZISP).

Paratypes. Russia: 4 females and 5 males from Khabarovskii and Primorskii krai, Evreiskaya Province.

Description. Female. Body length 2.8–5.5 mm; fore wing length 2.5–4.2 mm. Head width 1.4–1.5 times its median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.2–1.3 times length of temple. Occiput distinctly concave. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 1.0–1.3 times Od, 0.30–0.45 times OOL. Vertex with rather distinct and short median longitudinal groove in posterior half (but this groove absent in small specimens). Eye glabrous, 1.2–1.3 times as high as broad. Malar space height 0.5–0.6 times height of eye and almost equal to basal width of mandible. Face almost flat, its width 1.2–1.4 times eye height and 1.1–1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8–1.0 times distance from edge of depression to eye, about 0.5 times width of face. Occipital carina absent near mandible, but connected to hypostomal carina by additional strong rugae. Hypostomal flange wide. Vertex weakly convex.

Antennae weakly thickened, almost filiform, 27–31-segmented, 1.1–1.2 times as long as body. First flagellar segment 4.5–5.5 times as long as its apical width, 1.3–1.4 times as long as second segment. Penultimate segment 2.3–2.7 times as long as wide, 0.4–0.45 times as long as first segment, nearly as long as apical segment; the latter pointed apically.

Mesosoma. Length 1.8–2.0 times its height. Pronotal keel distinct, posterior branch narrowly separated from posterior margin of pronotum, anterior branch fine and situated submedially on pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression more or less marginate, rather deep, wide, coarsely crenulate. Mesoscutum highly and weakly roundly raised above pronotum. Notauli wide, deep, complete and crenulate. Anterolateral corner of median lobe of mesoscutum absent. Prescutellar depression deep, with high median and 2 lateral carinae, almost smooth, with fine sparse rugulae only, 0.3–0.4 times as long as scutellum. Scutellum convex and carinate later-

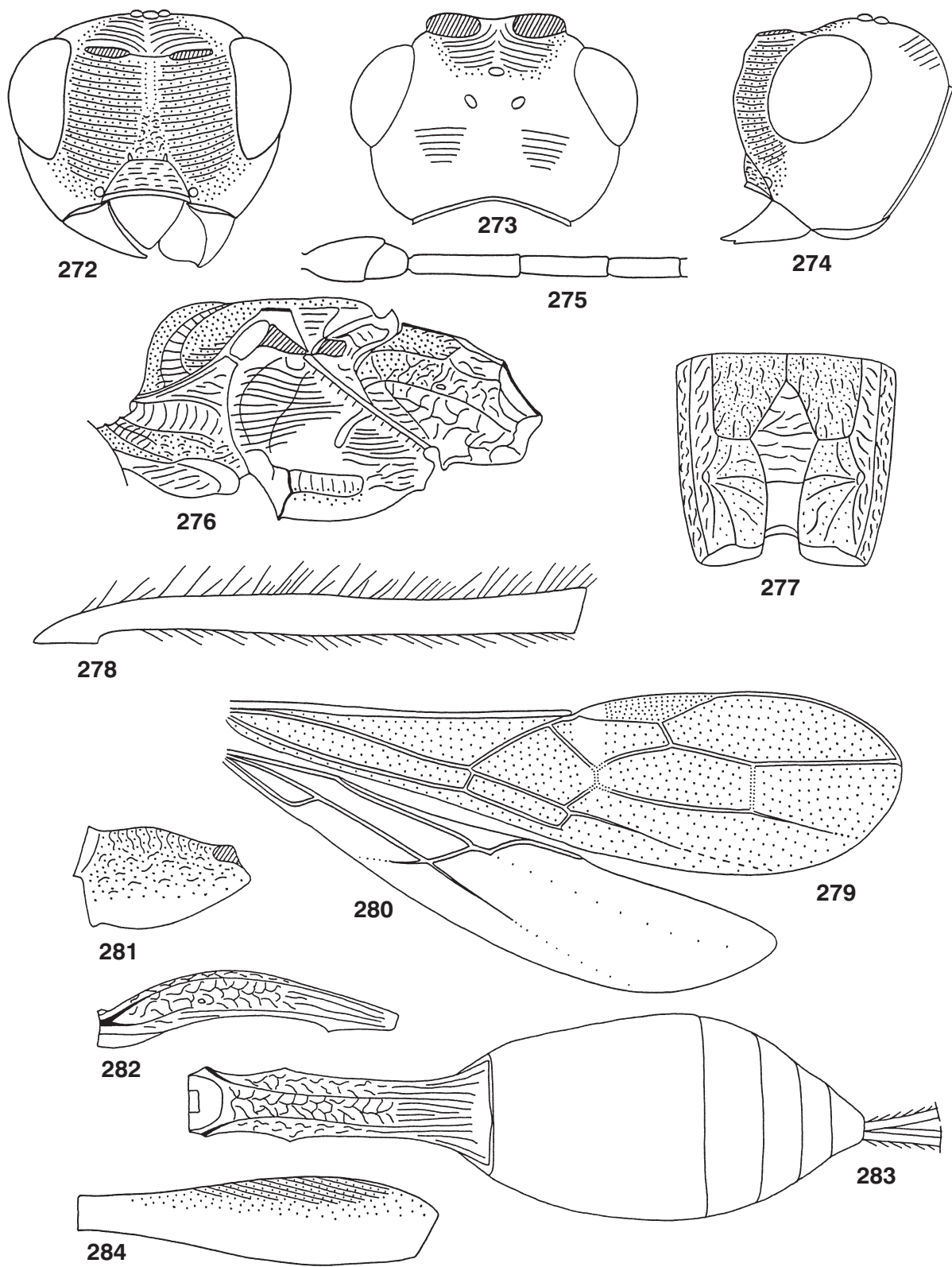
ally. Metanotum with short and wide pointed tooth. Subalar depression rather deep and wide, rugose-striate. Sternauli deep, wide, straight, coarsely crenulate, running along anterior 0.5–0.6 of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather short and wide. Propodeum with short and pointed lateral tubercles.

Wings. Fore wing 3.5–3.7 times as long as wide. Pterostigma 4.5–4.7 times as long as wide. Radial vein arising behind middle of pterostigma, rarely from middle. Radial cell not shortened, metacarpus 1.2–1.3 times as long as pterostigma. Second radial abscissa 2.8–3.7 times first abscissa and forming distinct angle with it, 0.5–0.6 times third abscissa, almost as long as first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 2.7–3.2 times maximum width, 1.2–1.5 times length of brachial cell. Distance from nervulus to basal vein 0.1–0.3 times length of nervulus. Nervulus perpendicular to anal vein. Parallel vein not interstitial, arising from anterior $\frac{1}{5}$ – $\frac{1}{4}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein. Hind wing 5.0–5.2 times as long as wide. First costal abscissa 0.6–0.7 times as long as second abscissa. First abscissa of mediocubital vein 0.70–0.75 times as long as second abscissa. Recurrent vein long, sclerotized at most part, oblique, antefurcal or interstitial.

Legs. Fore tibia with thick rather numerous spines arranged almost in one row. Hind coxa rather large (its length 1.5 times maximum width), with distinct basoventral tooth and corner. Hind femur claviform, 4.0–4.3 times as long as wide. Hind tibia apically with 2 spines on outer side. Hind basitarsus 0.75–0.80 times as long as second-fifth segments combined. Second tarsal segment 0.4–0.5 times as long as basitarsus, 1.4 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly convex ventrally, rather distinctly and regularly convex dorsally, distinctly thickened in basal half; distinctly and regularly widened in distal fifth (dorsal view), with small spiracular tubercles in basal third. Length of petiole 2.4–2.8 times its apical width, nearly twice length of propodeum; apical width 1.3–1.7 times width at level of spiracles, 2.0–2.5 times its minimum width. Second tergite without separate laterotergite. Second suture absent. Median length of second and third tergites combined 1.4–1.7 times basal width of second tergite, almost as long as their maximum width. Ovipositor straight. Ovipositor sheath 1.6–1.7 times as long as metasoma, 2.1–2.4 times as long as mesosoma, 0.8–0.9 times as long as body, nearly as long as fore wing.

Sculpture and pubescence. Vertex very fine striate at least laterally or sometimes completely smooth. Frons coarsely transversely striate, sometimes narrowly smooth medially. Face densely transversely striate with rugulosity between striae, narrowly smooth medially. Scape densely and finely granulate. Mesoscutum dense-



Figures 272–284. *S. clarifemur*: (272) head, frontal view, (273) head, dorsal view, (274) head, lateral view, (275) 5 basal segments of antenna, (276) mesosoma, lateral view, (277) propodeum, (278) hind tibia, (279) fore wing, (280) hind wing, (281) hind coxa, (282) petiole, lateral view, (283) metasoma, dorsal view, (284) hind femur.

ly granulate, with coarse rugae medioposteriorly; with rather short rugae at lobes near notauli and laterally (which is absent in small specimens). Scutellum granulate, with fine and sparse rugae usually. Mesopleura smooth at rather small submedian area, rugulose-striate posteriorly, widely striate upper; prepectus rugulose ventrally. Propodeum densely rugose with granulation, sparsely rugose-striate in posterior half; areas distinctly marginate, areola large, petiolate area long and distinctly separated from areola by high carina; basal carina usually short, 0.35–0.75 (rarely 1.3) times length of fork of areola. Hind coxae rugulose with granulation, coarsely concentrically striate dorsally. Hind femur finely coriaceous, striate-granulate dorsally. Petiole densely rugose-striate. Rest of tergites smooth. Mesoscutum with sparse rather short and semi-erect hairs along notauli and marginally. Mesopleura widely bare medially. Hairs of dorsal surface of hind tibia semi-erect, dense and rather short, their length 0.7–0.9 times maximum width of tibia.

Colour. Body dark reddish brown or redish brown, head lighter. Antennae dark brown, two basal segments light brown, sometimes light reddish brown. Palpi yellow. Fore and middle legs light brown or light reddish brown, hind coxa and trochanters pale brown, hind femur, tibia and tarsus light reddish brown or reddish brown, sometimes almost entirely light brown; hind tibia faintly infuscate basally. Ovipositor sheath light reddish brown, almost black apically. Fore wing rather evenly infuscate, without hyaline stripes. Pterostigma dark brown, yellow in basal quarter.

Male. Body length 3.8–4.0 mm; fore wing length 2.8–3.2 mm. Areola of propodeum small; basal carina long, 1.8–2.0 times as long as fork of areola. Second metasomal tergite sometimes finely striate basally. Otherwise similar to female.

Discussion. This species is in the *S. fasciatus* Walker group and similar to *S. erymanthus* Nixon (Philippines) (Nixon 1943: couplet 22, page 206). Differences between these species are indicated in the following key:

- 22a. Head distinctly narrowed behind eyes. Ocelli in triangle with base 1.2–1.3 times its sides. Lateral pronotal depression densely and coarsely striate. Mesonotum almost perpendicularly raised above pronotum. Scutellum distinctly granulate. Areola of propodeum distinctly marginate. Hind tibia faintly infuscate basally, yellowish brown at most part *S. clavifemur* Belokobylskij
- Head weakly narrowed behind eyes. Ocelli in an equilateral triangle. Lateral pronotal depression finely and sparsely striate. Mesonotum gradually raised above pronotum. Scutellum faintly rugose. Areola of propodeum indistinctly marginate. Hind tibia pale basally, brown at most part *S. erymanthus* Nixon

This species is also similar to *S. colophon* Nixon (Nixon 1943: couplet 38, page 208); the differences are indicated in the following key:

- 38a. Vertex finely and partly striate. Hind femur claviform, 4.0–4.3 times as long as wide. Mesoscutum with short and rather fine rugae nearly notauli. Hairs of dorsal surface of hind tibia 0.7–0.8 times as long as maximum width of tibia *S. clavifemur* Belokobylskij
- Vertex coarsely and almost entirely irregularly striate. Hind femur elongate-oval, 3.3 times as long as wide. Mesoscutum with long and coarse rugae nearly notauli. Hairs of dorsal surface of hind tibia 1.3–1.7 times as long as maximum width of tibia *S. colophon* Nixon

Distribution. Russia (Khabarovskii and Primorskii krai), Evreiskaya Province.

Spathius convexitemporalis Belokobylskij, 1996

Spathius convexitemporalis Belokobylskij, 1996a: 186 (description, figures).

Material. Holotype, female, China, "Taiwan, Wushe, 1150 m, 13 IV 1983, H. Townes" (AEG).

Discussion. A detailed description of this species in the *S. fasciatus* Walker group was given in Belokobylskij (1996a: 186–188). This species is similar to *S. sabronensis* Nixon (New Guinea) (Nixon 1943: couplet 43, page 209) because the head behind the eyes is distinctly convex; the differences between these species are shown in the following key:

- 43a. Pronotal keel not connected with posterior margin of pronotum. Mesonotum with sparse and rather long hairs situated along notauli and marginally. First flagellar segment short, 1.2 times as long as second segment. Ocelli situated near median level of eyes *S. convexitemporalis* Belokobylskij
- Pronotal keel widely fused with posterior margin of pronotum. Mesonotum with dense and short hairs everywhere. First flagellar segment long, 1.5 times as long as second segment. Ocelli situated distinctly before median level of eyes *S. sabronensis* Nixon

This species is also similar to *S. colophon* Nixon (Borneo, Philippines) (Nixon 1943: couplet 34, page 208); the differences are indicated in the following key:

- 34a. Head behind eyes distinctly convex. Vertex finely striate only medially. Antennae shorter and 23-segmented. Hind coxa without basoventral tooth. Ovipositor sheath shorter, almost as long as metasoma *S. convexitemporalis* Belokobylskij
- Head behind eyes distinctly narrowed. Vertex strongly and entirely striate. Antennae longer and 44-segmented. Hind coxa with basoventral tooth. Ovipositor sheath longer, a little shorter than mesosoma and metasoma combined *S. colophon* Nixon

Distribution. China (Taiwan).

Spathius esakii Watanabe, 1945
(Figs 285–297)

Spathius esakii Watanabe, 1945: 47; Shenefelt and Marsh 1976: 1399.

Material. Holotype: female, “[Caroline Isls] Ponape, Matalanim-Nipit, 12.I.1938, Teiso Esaki”, “*Spathius esakii* Watanabe, Type” (KUFJ).

Description. Female. Body length 4.4 mm; fore wing length 3.3 mm. Head not depressed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli medium sized, in triangle with base 1.25 times its sides; POL almost equal to Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.5 times eye height and almost equal to basal width of mandible. Face width 1.1 times as long as eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8 times distance from edge of depression to eye. Occipital carina absent at rather long distance near mandible and not fused with hypostomal carina, complete dorsally.

Antennae rather slender, almost filiform, more than 36-segmented (apical segments missing). Scape 1.7 times as long as wide. First flagellar segment 6.5 times as long as its apical width, 1.3 times as long as second segment. Subapical segments 3.0–3.2 times as long as wide. Hairs of antenna rather sparse and semi-erect.

Mesosoma. Length of mesosoma about twice its height. Pronotal keel distinct, its posterior branch shortly separated from posterior margin of pronotum, anterior branch widely separated and situated near middle of pronotum. Pronotal lateral depression wide, widened posteriorly, marginate, very sparsely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, but shallow in posterior half, sparsely crenulate. Prescutellar depression long, deep, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum weakly convex. Subalar depression shallow, wide, coarsely and sparsely striate. Sternauli distinct, deep, widened medially, weakly curved, sparsely and distinctly crenulate, running along entire length of lower part of mesopleura. Metanotum with short, wide, and weakly pointed tooth. Metapleural flange long and rather narrow. Propodeum with small lateral tubercles.

Wings. Fore wing 3.7 times as long as wide. Radial vein arising slightly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 3.6 times first abscissa and forming widely obtuse angle with it, 0.55 times third abscissa, 0.9 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length almost 3 times maximum width, 1.5 times length of brachial cell. Recurrent vein twice second abscissa of medial vein. Nervulus perpendicular to anal vein. Distance from nervulus to basal vein 0.5 times nervulus

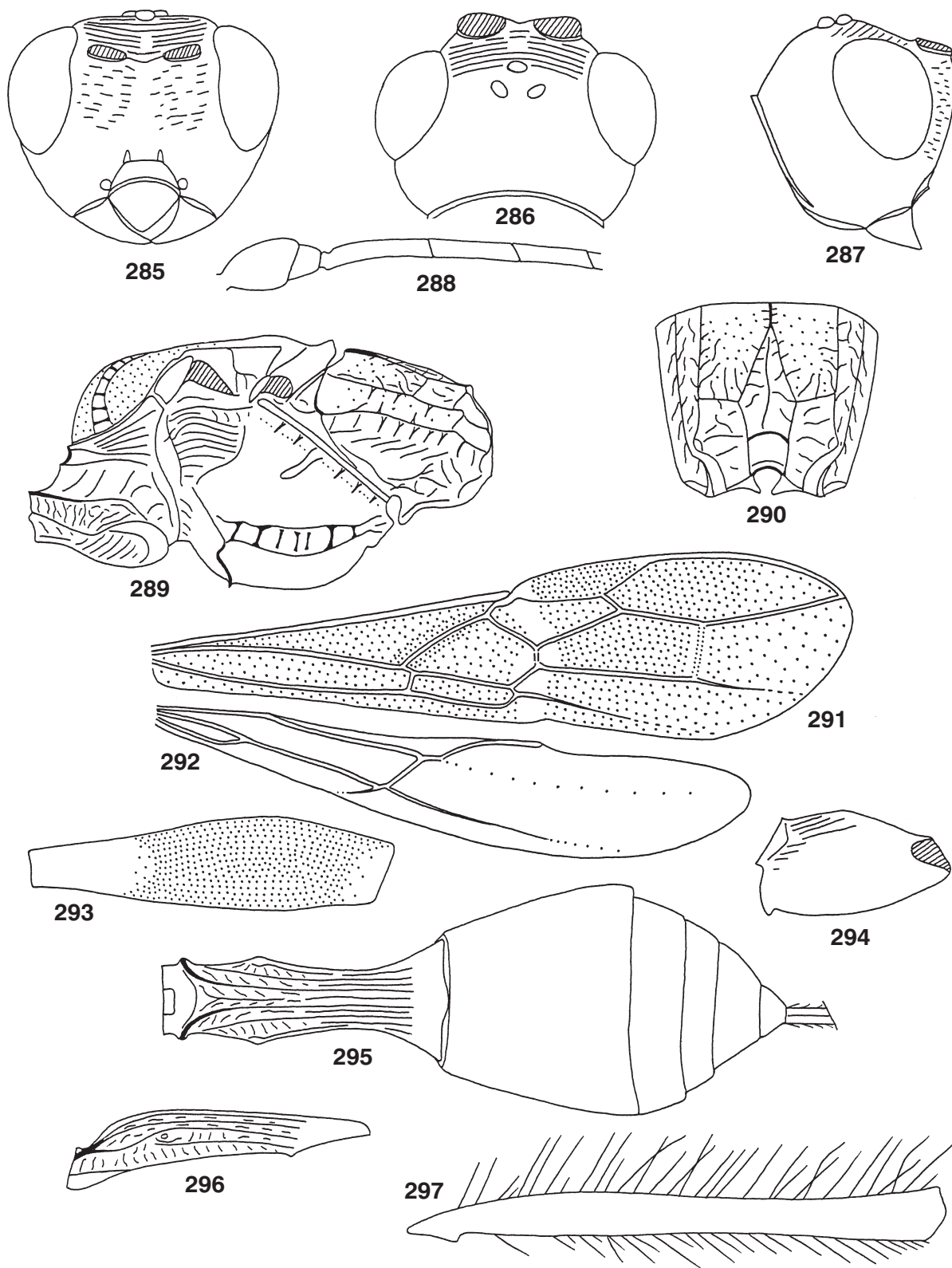
length. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of brachial vein. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.8 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein antefurcal.

Legs. Hind coxa medium size (its length 1.75 times maximum width), with basoventral tooth and corner. Hind femur more or less claviform, 3.8 times as long as wide. Hind tibia apically without distinct spines. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.1 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) very slightly and regularly curved ventrally, convexly and regularly curved dorsally, distinctly thickened in basal third; distinctly widened near spiracles and in apical $\frac{1}{3}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.2 times its apical width, almost twice length of propodeum; apical width 1.6 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.2 times basal width of second tergite, 0.8 times their maximum width. Ovipositor straight. Ovipositor sheath 1.2 times as long as metasoma, 2.8 times as long as petiole, 1.8 times as long as mesosoma, 0.9 times as long as fore wing.

Sculpture and pubescence. Vertex smooth. Frons coarsely striate. Face finely and interruptedly striate, smooth medially. Temple smooth. Mesoscutum very finely coriaceous almost entirely, shining, with 2 distinctly convergent carinae in posterior half, very finely rugulose between carina; without rugae near notauli. Scutellum smooth. Mesopleura smooth. Metapleura coarsely and sparsely rugose. Propodeum coarsely and sparsely rugose, almost smooth basoventrally at short distance; with distinctly marginate areas, areola rather short and wide, petiolate area distinctly separated and short; basal carina short, 0.4 times as long as fork of areola. Hind coxae smooth at most part, shortly striate anterodorsally. Hind femur smooth. Petiole coarsely striate, with very fine rugosity between striae. Rest of tergites smooth. Mesoscutum with rather dense long semi-erect hairs along notauli and laterally. Hairs of dorsal surface of hind tibia only long, rather dense, erect, their length 1.4–1.6 times maximum width of tibia.

Colour. Head light reddish brown, darker posteriorly. Mesosoma reddish brown, sides of pronotum and propodeum almost black. Petiole black, rest part of metasoma dark reddish brown. Antennae light reddish brown in basal half, darkened toward apex, almost black in apical $\frac{1}{3}$, without pale segments. Palpi pale yellow. Legs yellow, pale basally, hind femur dark reddish brown in subapical $\frac{2}{3}$; hind tibia entirely yellow. Ovipositor sheath light reddish brown, almost black api-



Figures 285–297. *S. esakii*: (285) head, frontal view, (286) head, dorsal view, (287) head, lateral view, (288) 5 basal segments of antenna, (289) mesosoma, lateral view, (290) propodeum, (291) fore wing, (292) hind wing, (293) hind femur, (294) hind coxa, (295) metasoma, dorsal view, (296) petiole, lateral view, (297) hind tibia.

cally. Fore wing distinctly and almost entirely infuscate. Pterostigma dark brown, yellow in basal $\frac{1}{5}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group. In the subgroup with the vertex smooth, this species is similar to *S. erymanthus* Nixon (Philippines) (Nixon 1943: couplet 22, page 206); their differences are shown in the following key:

- 22a. Mesoscutum almost smooth and without rugae near notauli. Mesosoma reddish brown, sides of pronotum and propodeum almost black, petiole black, rest part of metasoma dark reddish brown. Hind coxa with distinct basoventral tooth. Mesopleura smooth *S. esakii* Watanabe
 -. Mesoscutum distinctly granulate and with feeble rugae near notauli. Body fulvous red entirely. Hind coxa with trace of basoventral tooth only. Mesopleura sculptured at most part *S. erymanthus* Nixon

S. esakii Watanabe is also similar to *S. athesis* Nixon (Philippines) (Nixon 1943: couplet 23, page 207); their differences are in the following key:

- 23a. Pronotal keel not fused with posterior margin of pronotum. Mesoscutum almost smooth and without rugae along notauli. Ovipositor short, ovipositor sheath 1.2 times as long as metasoma. Hind femur less claviform
 *S. esakii* Watanabe
 -. Pronotal keel distinctly fused with posterior margin of pronotum. Mesoscutum granulate and with distinct rugae along notauli. Ovipositor long, ovipositor sheath as long as body. Hind femur distinctly claviform . . . *S. athesis* Nixon

Distribution. Caroline Is.

Spathius flavicornis Szépligeti, 1913
 (Figs 298–309)

Spathius flavicornis Szépligeti, 1913: 599; Nixon 1943: 438; Shenefelt and Marsh 1976: 1403.

Material. Holotype: female, "Africa or., Katona", "Arusha-Ju, 1905", "Holotypus ♀ *Spathius flavicornis* Szépl. 1913, des. Papp J., 1969", "Hym. Typ. No 1571. Mus. Budapest", "*Spathius flavicornis* m." (handwriting by Szépligeti) (HNHM).

Description. Female. Body length 3.4 mm; fore wing length 2.8 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly and almost linearly narrowed. Transverse diameter of eye 1.6 times length of temple. Ocelli rather small, in triangle with base 1.25 times its sides; POL 1.7 times Od, 0.45 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and nearly equal to basal width of mandible. Face width 1.15 times eye height and equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and almost round, its width equal to distance from edge of depression to eye, 0.4 times width of face.

Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally.

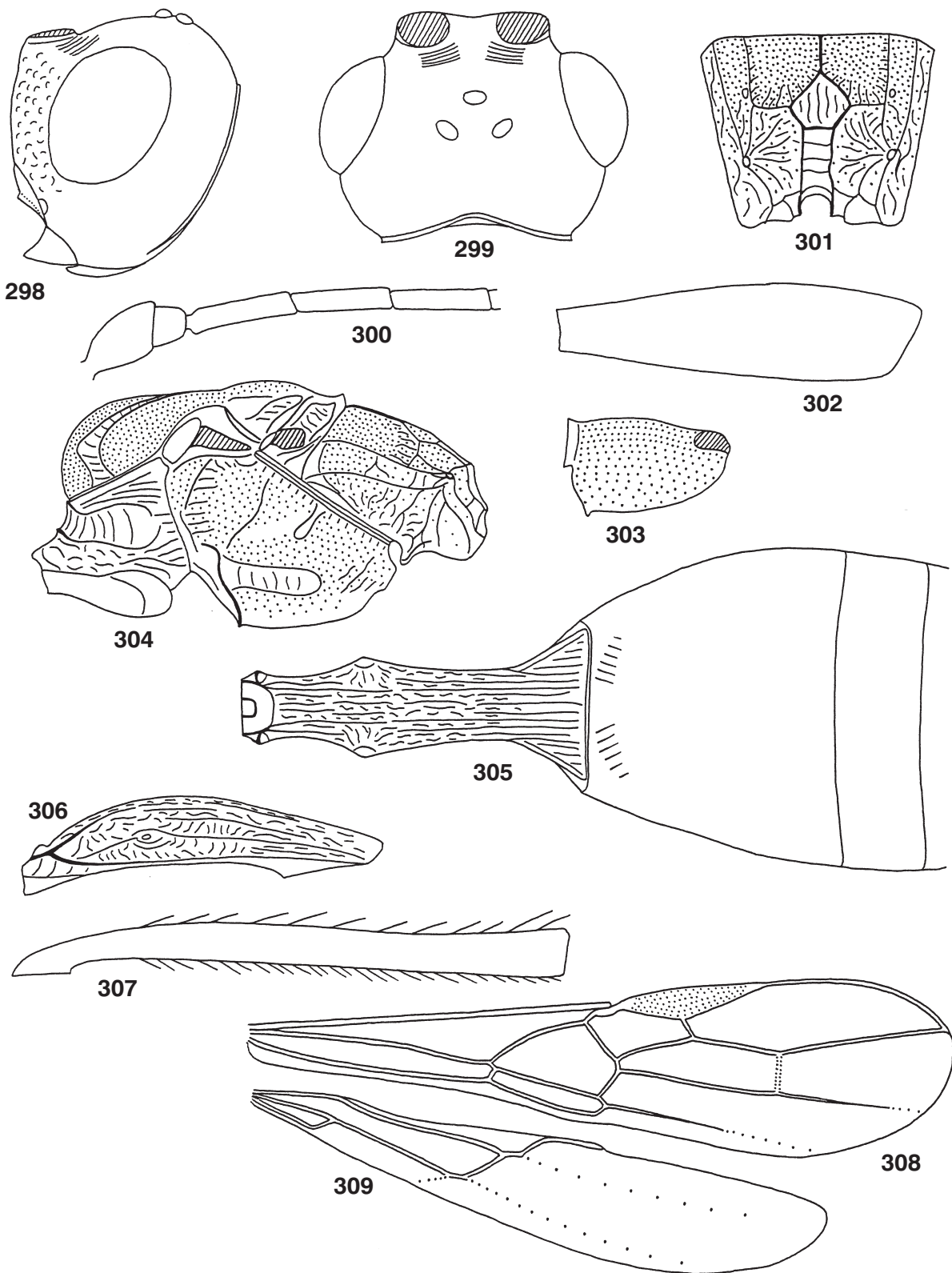
Antennae rather slender, filiform, more than 22-segmented (apical segments missing). First flagellar segment 4.3 times as long as its apical width, 1.1 times as long as second segment. Subapical segments 3.3 times as long as wide.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel distinct, posterior branch widely fused with posterior margin of pronotum; anterior branch situated almost on middle of pronotum. Pronotum subanteriorly with distinct curved transverse carina. Pronotal lateral depression wide, rather deep, marginate, granulate, with several rather dense costae. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli rather deep anteriorly, shallow posteriorly, rather narrow, complete, finely crenulate. Prescutellar depression deep, rather wide, with 3 carinae, almost smooth, 0.3 times as long as scutellum. Scutellum weakly convex. Subalar depression shallow, wide, granulate-rugose. Sternauli deep, wide, straight, densely crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and narrow. Propodeum with small, but distinct lateral tubercles.

Wings. Fore wing 3.8 times as long as wide. Pterostigma about 5 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 4.0 times first abscissa and forming distinct angle with it, 0.6 times third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.6 times maximum width, 1.5 times length of narrow brachial cell. Recurrent vein 1.8 times second abscissa of medial vein. Distance from nervulus to basal vein 0.4 times nervulus length. Parallel vein not interstitial, arising slightly behind middle of brachial vein. Mediocubital vein very weakly curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein almost 0.6 times second abscissa. Recurrent vein unsclerotized, curved, antefurcal.

Legs. Fore tibia with rather dense slender spines arranged in one row. Hind coxa medium size (its length 1.6 times maximum width), with small basoventral tooth and rather distinct corner. Hind femur 3.7 times as long as wide. Hind tibia without apical spines on outer margin, with 3 transverse rows of dense hairs on inner apical margin. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.55 times as long as basitarsus, 1.1 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, distinctly and regularly curved dorsally, distinctly



Figures 298–309. *S. flavicornis*: (298) head, lateral view, (299) head, dorsal view, (300) 5 basal segments of antenna, (301) propodeum, (302) hind femur, (303) hind coxa, (304) mesosoma, lateral view, (305) 4 basal segments of metasoma, dorsal view, (306) petiole, lateral view, (307) hind tibia, (308) fore wing, (309) hind wing.

thickened submedially; widened in apical quarter (dorsal view), with spiracular tubercles in basal 1/3. Length of petiole 2.3 times its apical width, 1.7 times length of propodeum; apical width 1.6 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.5 times basal width of second tergite, 0.8 times their maximum width. Ovipositor straight. Ovipositor sheath 0.6 times as long as metasoma, 1.6 times as long as petiole, 0.4 times as long as fore wing, 0.9 times as long as mesosoma.

Sculpture and pubescence. Vertex smooth. Frons smooth, but finely striate near antennal sockets. Face almost entirely coriaceous. Temple smooth. Mesoscutum entirely densely granulate, with 2 convergent carinae in posterior half, without rugae along notauli. Scutellum densely granulate. Mesopleura finely and densely granulate, almost smooth at narrow median elongate area. Propodeum with marginate areas, basoventral areas rugulose-granulate, areola rather wide, short, pentagonal, sparsely rugose; petiolate area rather distinctly separated, long and narrow; rest of propodeum rugose; basal carina 0.7 times as long as fork of areola. Hind coxa entirely densely granulate. Hind femur very finely striate-coriaceous. Petiole rugulose-striate, only rugulose in basomedian half. Second tergite finely striate at very short distance basally. Rest part of metasoma smooth. Mesoscutum with sparse, rather short, semi-erect white hairs along notauli and marginally. Dorsal surface of hind tibia with rather short, sparse, semi-erect hairs, their length 0.7–0.9 times maximum width of tibia.

Colour. Body dark reddish brown, petiola apically and gaster medially lighter, apex of metasoma yellow. Antenna light brown, 2 basal segments yellow. Palpi yellow, Legs yellow, tarsi brownish. Ovipositor sheath brownish yellow in basal 1/3, brown on other part. Fore wing infusate. Pterostigma brown, yellow basally and apically.

Discussion. This species is in the *S. fasciatus* Walker group and similar to African *S. rufithorax* Szépligeti (Nixon 1943: couplet 3, page 205); their differences are indicated in the following key:

- 3a. Hind legs entirely yellow. Frons almost entirely smooth. Mesoscutum almost perpendicularly raised above pronotum. Scutellum granulate. Mesopleura granulate-coriaceous. Petiole 1.7 times as long as propodeum. Ovipositor shorter, ovipositor sheath 0.6 times as long as metasoma *S. flavicornis* Szépligeti
 – Hind coxa and femur reddish brown, hind tibia dark brown, pale basally, hind tarsus brownish. Frons closely striate. Mesoscutum gradually raised above pronotum. Scutellum almost smooth. Mesopleura more or less smooth. Petiole twice as long as propodeum. Ovipositor longer, ovipositor sheath as long as metasoma and propodeum combined ...
 *S. rufithorax* Szépligeti

Distribution. Tanzania.

Spathius fulvus Szépligeti, 1905
(Figs 310–322)

Spathius fulvus Szépligeti, 1905: 42; Nixon 1943: 438; Shenefelt and Marsh 1976: 1404.

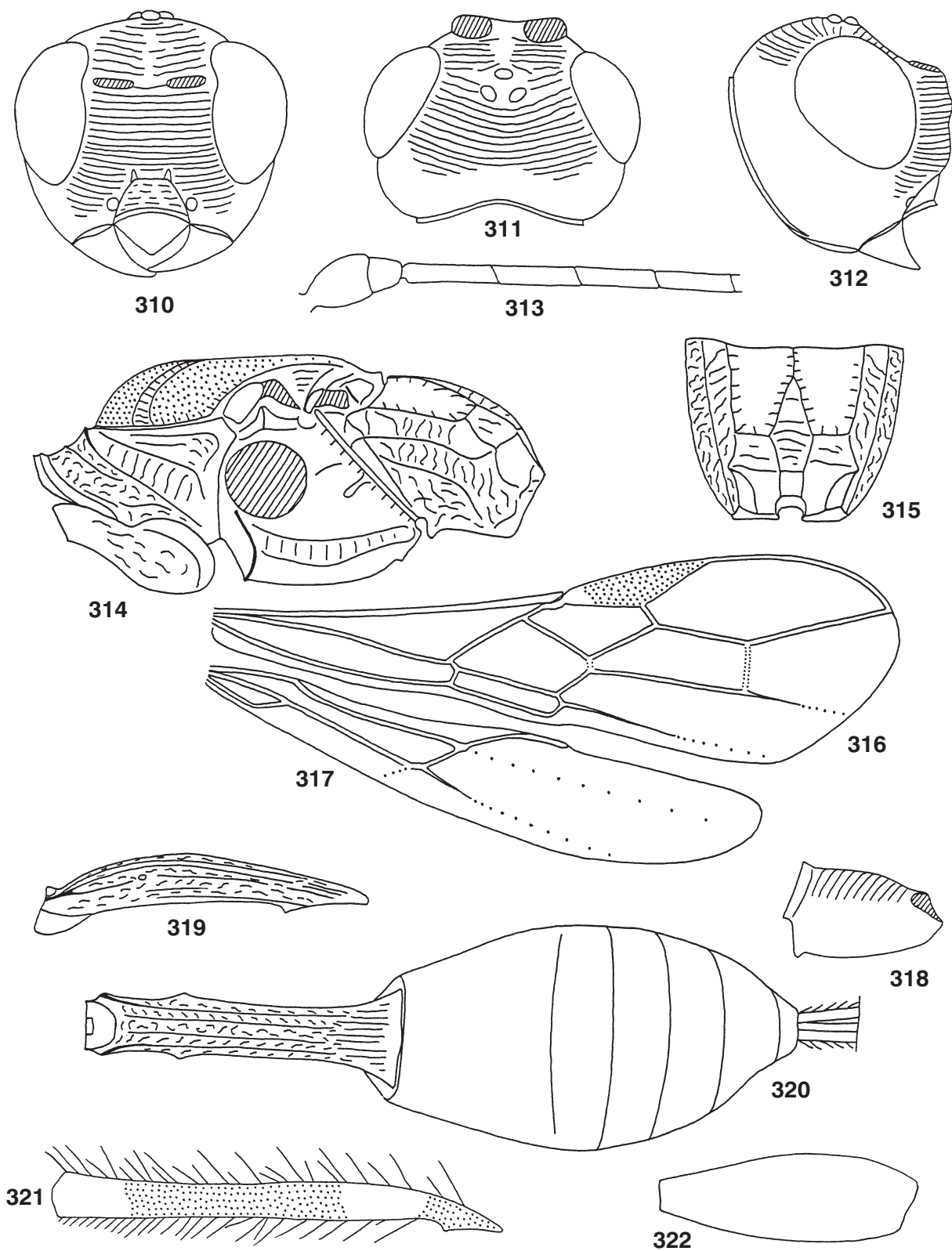
Material. Holotype: female, “N.-Guinea, Biro, 1899”, “Simbang, Huon Golf”, “Holotypus ♀ *Spathius fulvus* Szepl. 1905” (below: “des. Papp J. 1969”), “Hym. Typ. No 1589, Mus. Budapest” (HNHM).

Description. Female. Body length 4.0 mm; fore wing length 2.7 mm. Head not depressed, its width 1.55 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli rather small, in triangle with base 1.1 times its sides; POL 0.75 times Od, 0.3 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and 0.8 times basal width of mandible. Face width equal to eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally.

Antennae slender, filiform, more than 30-segmented (apical segments missing). First flagellar segment 6 times as long as its apical width, 1.1 times as long as second segment. Subapical segments 3.8 times as long as wide.

Mesosoma not depressed. Length of mesosoma about twice its height. Pronotal keel distinct, posterior branch situated very closely to mesonotum, but not fused; anterior branch situated almost on middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather wide, short, marginate, sparsely and coarsely crenulate. Mesoscutum rather highly and roundly raised above pronotum. Notauli deep, complete, rather wide, crenulate. Prescutellar depression deep, wide, with 3 carinae, almost smooth, 0.4 times as long as scutellum. Scutellum convex. Subalar depression rather shallow (brocken at most part). Sternauli shallow, but deep medially, weakly S-shaped, sparsely crenulate, running along entire length of lower part of mesopleura. Metanotum with short pointed tooth. Metapleural flange wide and short. Propodeum with very small lateral tubercles.

Wings. Fore wing 3.4 times as long as wide. Pterostigma 4.0 times as long as wide. Radial vein arising slightly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.3 times first abscissa and forming very obtuse angle with it, 0.6 times straight third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 3.4 times maximum width, 1.5 times length of narrow brachial cell. Recurrent vein 3.7 times second abscissa of medial vein. Nervulus perpendicular to anal vein.



Figures 310–322. *S. fulvus*: (310) head, frontal view, (311) head, dorsal view, (312) head, lateral view, (313) 6 basal segments of antenna, (314) mesosoma, lateral view, (315) propodeum, (316) fore wing, (317) hind wing, (318) hind coxa, (319) petiole, lateral view, (320) metasoma, dorsal view, (321) hind tibia, (322) hind femur.

Distance from nervulus to basal vein 0.5 times nervulus length. Parallel vein not interstitial, arising from anterior 2/5 of brachial vein. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 5.8 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein almost 0.6 times second abscissa. Recurrent vein unsclerotized, weakly curved, weakly antefurcal.

Legs. Fore tibia with rather numerous slender spines arranged in narrow row. Hind coxa medium size (its length 1.7 times maximum width), with basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tibia apically with 5 outer spines. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.15 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, weakly and regularly curved dorsally, distinctly thickened in basal third; distinctly widened apically (dorsal view), with spiracular tubercles in basal third. Length of petiole 3 times its apical width, 1.8 times length of propodeum; apical width 1.4 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.35 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 1.1 times as long as metasoma, 2.5 times as long as petiole, 0.8 times as long as fore wing, 1.5 times as long as mesosoma.

Sculpture and pubescence. Vertex transversely and more or less semicircularly striate, smooth in posterior 1/4. Frons densely and undulately transversely striate. Face almost entirely transversely striate, with granulation between striae in upper 1/3. Temple smooth. Mesoscutum densely granulate, with long rugae along notauli and laterally, only granulate at narrow median areas on all lobes. Scutellum very finely granulate. Mesopleura almost smooth. Propodeum smooth, with fine rugae in posterior half, with distinctly marginate areas, areola long and narrow, with 6 transverse striae, petiolate area short and distinctly separate by high carina; basal carina 0.3 times as long as fork of areola. Metapleura smooth in anterior half, rugose-reticulate in posterior half. Hind coxa circularly striate dorsally, smooth laterally. Hind femur smooth. Petiole sparsely striate, with fine rugulosity between striae, finely striate in apical 1/3. Rest of tergites smooth. Mesoscutum entirely with rather short dense, semi-erect hairs. Hairs on dorsal surface of hind tibia rather long, sparse, almost erect, their length 1.0–1.2 times maximum width of tibia.

Colour. Head and metasoma brownish yellow, mesosoma light reddish brown, mesoscutum yellowish brown. Antennae yellow, faintly darkened toward apex. Palpi pale yellow. Legs brownish yellow, fore and middle coxae yellow, hind tibia pale yellow in subbasal 1/3. Ovipositor

sheath brownish yellow. Fore wing faintly infusate. Pterostigma light brown, pale yellow in basal 1/4.

Discussion. This species is in the *S. fasciatus* Walker group and similar to *S. cavillator* Wilkinson (Nixon 1943: couplet 44, page 209), because the mesoscutum is entirely setose and the hind tibia has the same coloration. The differences between these species are indicated in the following key:

- 44a. Vertex striate in anterior 3/4, smooth in posterior 1/4. Pronotal keel shortly separated from posterior margin of pronotum. Propodeal tubercles very small. Petiole longer, 1.8 times as long as propodeum, weakly thickened submedially. Ovipositor longer; ovipositor sheath 1.1 times as long as metasoma *S. fulvus* Szépligeti
- Vertex entirely coarsely striate. Pronotal keel fused with posterior margin of pronotum. Propodeal tubercles distinct. Petiole shorter, about 1.5 times as long as propodeum, distinctly thickened submedially. Ovipositor shorter; ovipositor sheath distinctly shorter than metasoma *S. cavillator* Wilkinson

The differences between *S. fulvus* Szépligeti and *S. japonensis* Nixon (both species are from New Guinea) are the following:

1. Head and metasoma brownish yellow, mesosoma light reddish brown, mesoscutum yellowish brown. Hind coxa light. Hind tarsus brownish yellow. Fore wing faintly infusate. Vertex smooth in posterior 1/3. Radial vein of fore wing arising behind middle of pterostigma. Pronotal keel separate from posterior margin of pronotum . . . *S. fulvus* Szépligeti
- Body dark brown to black partly. Hind coxa dark brown at most part. Hind tarsus dark brown. Fore wing brown. Vertex entirely striate. Radial vein of fore wing arising slightly before middle of pterostigma. Pronotal keel fused with posterior margin of pronotum *S. japonensis* Nixon

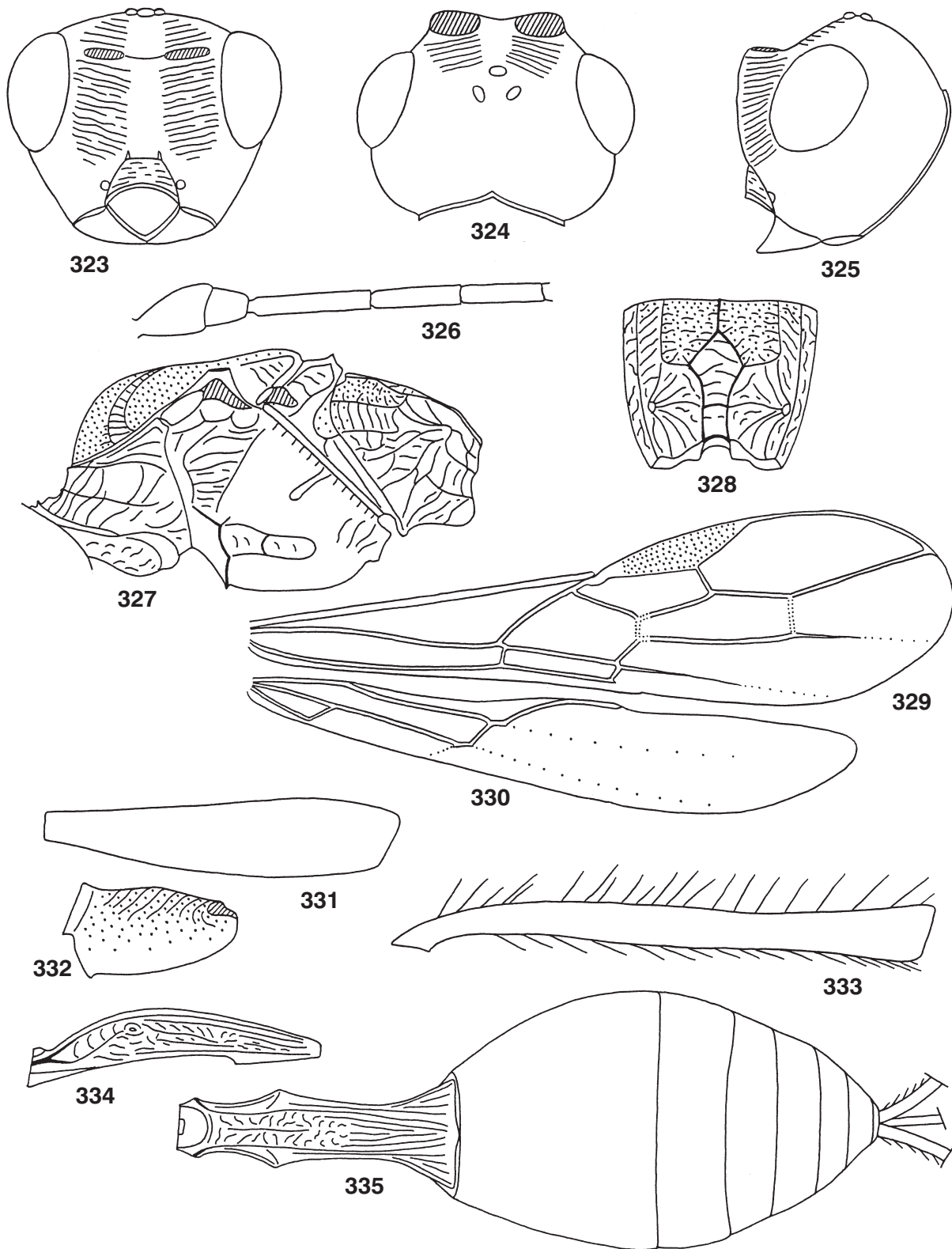
Distribution. New Guinea.

Spathius hikoensis Belokobylskij, 1998
(Figs 323–335)

Spathius hikoensis Belokobylskij, 1998: 89.

Material. Holotype: female, "Japan: Kyushu, 700 m, Fukuoka, Mt. Hiko, 2–9.X.1989, M.T., K. Takeno & M. Sharkey" (FAHU).

Description. Female. Body length 3.0 mm; fore wing length 2.3 mm. Head width 1.6 times its median length. Head behind eye distinctly roundly narrowed. Transverse diameter of eye 1.3–1.4 times length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL 1.2 times Od, 0.4 times OOL. Eye almost glabrous, 1.25 times as high as broad. Malar space height 0.5 times eye height and equal to basal width of mandible. Face width 1.3 times eye height and 1.3 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression



Figures 323–335: *S. hikoensis*. (323) head, frontal view, (324) head, dorsal view, (325) head, lateral view, (326) 5 basal segments of antenna, (327) mesosoma, lateral view, (328) propodeum, (329) fore wing, (330) hind wing, (331) hind femur, (332) hind coxa, (333) hind tibia, (334) petiole, lateral view, (335) metasoma, dorsal view.

to eye, 0.4 times width of face. Occipital carina fused with hypostomal carina near mandible, complete dorsally. Hypostomal flange distinct, but narrow. Vertex convex.

Antennae slender, filiform, more than 19-segmented (apical segments missing). Scape 1.5 times as long as wide. First flagellar segment 5.7 times as long as its apical width, 1.4 times as long as second segment. Submedian segments 3.0 times as long as wide.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel distinct, its posterior branch narrowly fused medially with posterior margin of pronotum, anterior branch situated submedially and weakly curved. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather distinctly marginate, wide, rather deep, sparsely and coarsely crenulate, smooth between crenulae. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, complete, wide, sparsely crenulate. Prescutellar depression deep, long, with median carina, almost smooth, 0.4 times as long as scutellum. Scutellum convex, with lateral carinae. Metanotum with distinct pointed dorsal tooth. Subalar depression rather shallow, wide, rugulose-striate. Sternauli rather deep, straight, wide, finely and sparsely crenulate, running along anterior $\frac{3}{5}$ of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather short and narrow. Propodeum with short and wide lateral tubercles.

Wings. Fore wing 3.5 times as long as wide. Pterostigma 4.5 times as long as maximum width. Radial vein arising behind middle of pterostigma. Radial cell not shortened, metacarpus 1.3 times as long as pterostigma. Second radial abscissa 3 times first abscissa and forming obtuse angle with it, 0.6 times the straight third abscissa, 1.1 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.5 times maximum width, 1.7 times length of brachial cell. Brachial cell closed at level of recurrent vein. Recurrent vein 3 times second abscissa of medial vein. Distance from nervulus to basal vein 0.2 times nervulus length. Nervulus almost perpendicular to anal vein. Parallel vein almost interstitial. Mediocubital vein not curved to anal vein. Hind wing 5.6 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein short, unsclerotized, faintly pigmented, distinctly antefurcal.

Legs. Fore tibia with rather dense, slender, numerous spines arranged in narrow stripe. Hind coxa long (its length almost twice maximum width), with small basoventral tooth and distinct corner. Hind femur long and claviform, 4.8 times as long as wide. Hind tibia apically with 1 spine on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, 1.2 times as long as fifth segment (without pretarsus). Claws rather large.

Metasoma. Petiole (lateral view) weakly and regularly curved ventrally, distinctly and regularly curved dorsally, thickened in basal half, uniformly widened in apical $\frac{1}{3}$ (dorsal view), with distinct spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.6 times its apical width, twice length of propodeum; apical width 1.4 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture absent. Median length of second and third tergites combined 1.4 times basal width of second tergite, 0.75 times their maximum width. Ovipositor almost straight. Ovipositor sheath 0.6 times as long as body, 1.15 times as long as metasoma, 1.8 times as long as mesosoma, 0.8 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons very finely and face distinctly transversely striate. Mesoscutum densely granulate, with 2 convergent carinae and rugulose in small area medioposteriorly; lobes near notauli without distinct rugae. Scutellum finely granulate. Mesopleura almost smooth at most median part. Propodeum sparsely rugose, with granulation basally, areas distinctly marginate, areola rather large and pentagonal, petiolate area short, subsquare, distinctly separated by carina; basal carina 0.7 times as long as fork of areola. Hind coxae granulate, coarsely concentrically striate dorsally. Hind femora smooth at most part, finely striate dorsally. Petiole striate-rugose, densely striate in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with sparse long and erect hairs along notauli and laterally. Mesopleura widely bare. Hairs of dorsal surface of hind tibia almost erect, rather dense and long, their length 1.2–1.5 times maximum width of tibia.

Colour. Body reddish brown, metasoma behind petiole light reddish brown with yellow stripes. Antennae dark brown, 3 basal segments brownish yellow, 5 subapical segments whitish yellow. Palpi pale yellow. Legs light brown, hind femur in apical half and hind tibia partly darker, fore and middle coxae yellow. Ovipositor sheath light brown in basal $\frac{2}{3}$, dark apically. Fore wing faintly infusate. Pterostigma brown, pale in basal $\frac{1}{3}$ – $\frac{1}{4}$.

Discussion. This species is in the *S. fasciatus* Walker group and is very closely similar to *S. moscus* Nixon (Borneo) (Nixon 1943: couplet 24a, page 207); their differences are indicated in the following key:

- 24b. First flagellar segment distinctly longer than scape and pedicel combined. Frons with very fine striation. Scutellum finely coriaceous. Basolateral areas of propodeum densely rugose-granulate. Recurrent vein 3 times second abscissa of medial vein. Parallel vein interstitial. Petiole twice as long as propodeum *S. hikoensis* Belokobylskij
- . First flagellar segment equal to scape and pedicel combined. Frons with more coarse striation. Scutellum smooth. Basolateral areas of propodeum with very fine sculpture. Recurrent vein 1.5 times second abscissa of medial vein. Parallel vein not interstitial, arising almost from middle of distal margin of brachial cell. Petiole 1.7 times as long as propodeum *S. moscus* Nixon

This species is also similar to *S. clavifemur* Belokobylskij (Russian Far East) (Belokobylskij, 1998); their differences are indicated in the following key:

1. Hind femur narrow, 4.8 times as long as wide. Vertex without median depression. Dorsal hairs of hind tibia longer and sparse, 1.2–1.5 times as long as maximum width of tibia. Apical half of antenna with 7 pale subapical segments. Head behind eyes strongly narrowed *S. hikoensis* Belokobylskij
- Hind femur wider, 4 times as long as wide. Vertex without median depression. Dorsal hairs of hind tibia shorter and dense, 0.7–0.8 times as long as maximum width of tibia. Apical half of antenna without pale subapical segments. Head behind eyes less strongly narrowed *S. clavifemur* Belokobylskij

Distribution. Japan (Kyushu).

Spathius javanicus Szépligeti, 1908
(Figs 336–347)

Spathius javanicus Szépligeti, 1908: 220; Nixon 1943: 439; Shenefelt and Marsh 1976: 1406.

Material. Holotype: male, “E. Jacobson, Semarang, 1905, Java”, “Holotypus ♂ *Spathius javanicus* Szep. 1908” (below: “des. Papp J. 1969”), “Hym. Typ. No 1584, Mus. Budapest”, “*Spathius javanicus* m.” (handwriting by Szépligeti) (HNHM).

Description. Male. Body length 3.2 mm; fore wing length 2.2 mm. Head not depressed, its width 1.4 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye almost twice length of temple. Ocelli rather small, in almost equilateral triangle; POL 0.7 times Od, 0.3 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.3 times eye height and almost 0.7 times basal width of mandible. Face width slightly longer than eye height and almost equal to height of face and clypeus combined. Clypeus and hypoclypeal depression glued. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally.

Antennae rather slender, filiform, more than 15-segmented (apical segment missing). First flagellar segment 5.7 times as long as its apical width, 1.1 times as long as second segment. Submedian segments about 4 times as long as wide.

Mesosoma not depressed. Length of mesosoma about twice its height. Pronotal keel distinct, posterior branch widely fused medially with posterior margin of pronotum; anterior branch situated almost on middle of pronotum. Pronotum subanteriorly with high distinct transverse carina. Pronotal lateral depression wide, long, marginate, coarse and densely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli deep, complete, wide, crenulate. Prescutellar depression rather deep, with 3 carinae, smooth, 0.3 times as long as scutellum. Scutellum weakly convex. Subalar depression

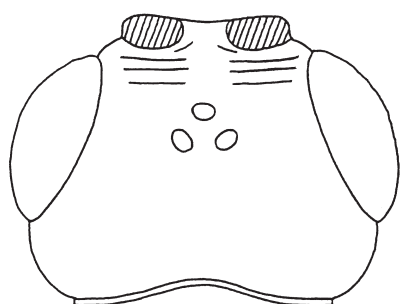
shallow, smooth. Sternauli wide, deep, almost straight, smooth, running along anterior half of lower part of mesopleura. Metanotum with short pointed tooth. Metapleural flange rather narrow and long. Propodeum with small, but distinct, pointed lateral tooth.

Wings. Fore wing 3.0 times as long as wide. Pterostigma 3.0 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.7 times first abscissa and forming very obtuse angle with it, 0.6 times third abscissa, 1.3 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 2.8 times maximum width, 1.4 times length of narrow brachial cell. Recurrent vein almost 6.0 times second abscissa of medial vein. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.3 times nervulus length. Parallel vein not interstitial, arising almost from middle of brachial vein. Mediocubital vein very weakly curved to anal vein in distal half. Hind wing about 5.0 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unsclerotized, antefurcal.

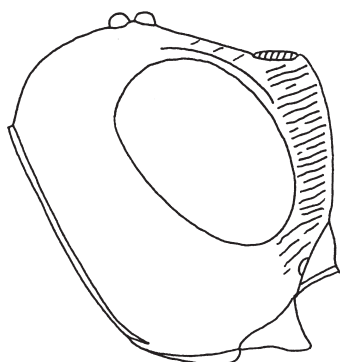
Legs. Fore tibia with rather numerous spines arranged almost in one row. Hind coxa medium size (its length 1.5 times maximum width), with basoventral tooth and corner. Hind femur 3.3 times as long as wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, about 1.2 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, distinctly and regularly curved, distinctly thickened submedially; distinctly widened in apical $\frac{1}{5}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 3 times its apical width, twice length of propodeum; apical width 1.5 times width at level of spiracles. Second and possible third tergites with separate laterotergites. Second suture absent. Median length of second and third tergites combined almost twice basal width of second tergite, 1.1 times their maximum width.

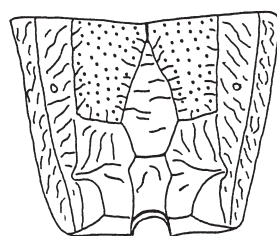
Sculpture and pubescence. Vertex and temple smooth. Frons very finely and sparsely striate. Mesoscutum densely granulate, median lobe also with fine transverse striation, without rugae near notauli, rugulose at small area medioposteriorly. Scutellum very finely granulate, almost smooth. Mesopleura smooth. Metapleura rugose. Propodeum with highly marginate areas, basoventral areas almost smooth in basal half, rugulose in apical half, areola long and rather wide, with several transverse striae; petiolate area distinctly separated and long; rest of propodeum sparsely rugulose-striate, with smooth areas; basal carina very short, 0.25 times as long as fork of areola. Hind coxa transversely striate dorsally, rugulose laterally. Hind femur finely striate dorsally, smooth at most



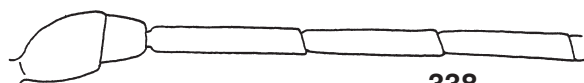
336



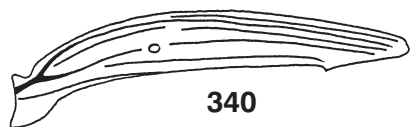
337



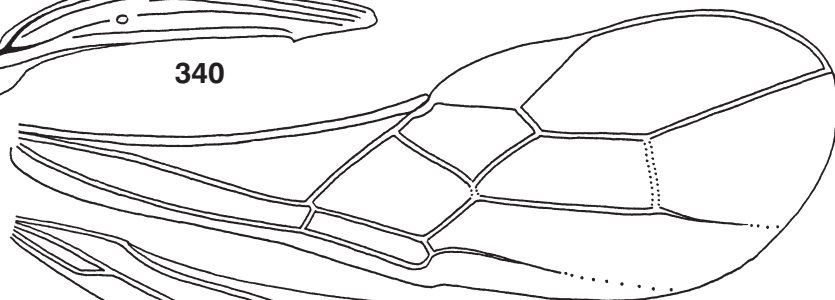
339



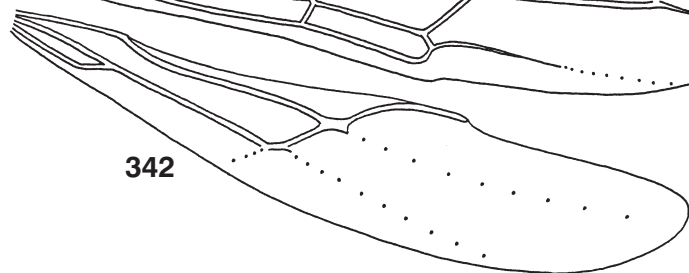
338



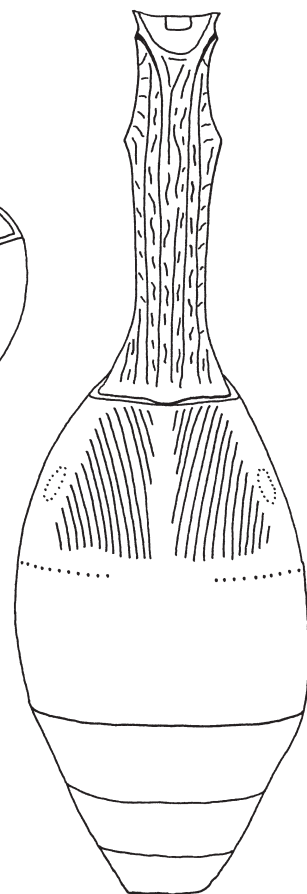
340



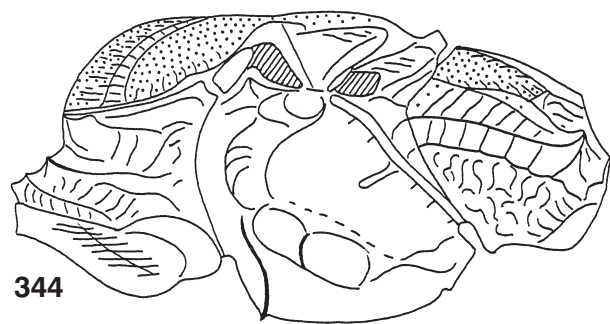
341



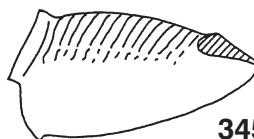
342



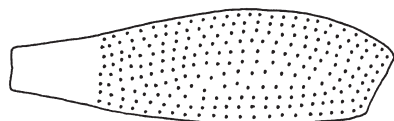
343



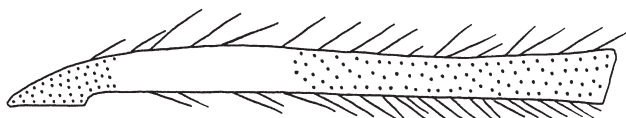
344



345



346



347

Figures 336–347. *S. javanicus*: (336) head, dorsal view, (337) head, lateral view, (338) 5 basal segments of antenna, (339) propodeum, (340) petiole, lateral view, (341) fore wing, (342) hind wing, (343) metasoma, dorsal view, (344) mesosoma, lateral view, (345) hind coxa, (346) hind femur, (347) hind tibia.

part. Petiole rather densely striate, narrowly rugulose medially in posterior half. Second tergite densely, regularly and weakly obliquely striate. Rest of tergites smooth. Mesoscutum with sparse semi-erect white hairs along notauli and marginally. Hairs of dorsal surface of hind tibia sparse, rather long and semi-erect, their length 1.0–1.2 times maximum width of tibia.

Colour. Body dark reddish brown, head light reddish brown. Antennae brown, 4 basal segment yellow. Palpi pale yellow. Legs yellow, hind coxa and femur at most part (except basal $\frac{1}{5}$) reddish brown; all tibiae faintly darker, but pale basally. Fore wing faintly infuscate. Pterostigma light brown.

Discussion. This species is in the *S. fasciatus* Walker group in spite of longitudinal striation on the second metasomal tergite in the male. Such sculpture of the tergite and the separated laterotergites on the second and sometimes third tergites are known in males of several species from this species group. *S. javanicus* Szépligeti is similar to *S. neleus* Nixon from Borneo (Nixon 1943: couplet 25, page 207); their differences are indicated in the following key:

- 25a. Mesoscutum without rugae near notauli. Recurrent vein of fore wing distinctly postfurcal. Petiole long, twice as long as propodeum *S. javanicus* Szépligeti
 – Mesoscutum with more or less distinct and rather long rugae near notauli. Recurrent vein of fore wing almost interstitial. Petiole shorter, 1.7 times as long as propodeum *S. neleus* Nixon

This species is also similar to *S. kunashiri* Belokobylskij (Russian Far East); their differences are indicated in the following key:

1. First flagellar segment slender, 5.7 times as long as apical width. Basal carina of propodeum short, 0.25 times as long as fork of areola. Basolateral areas of propodeum smooth in basal half. Petiole long, 3 times as long as apical width, twice as long as propodeum. Hind legs dark
 *javanicus* Szépligeti
 – First flagellar segment thicker, 4.5–4.8 times as long as apical width. Basal carina of propodeum long, 1.2–1.7 times as long as fork of areola. Basolateral areas of propodeum granulate-rugose entirely. Petiole short, 2.0–2.3 times as long as apical width, 1.5–1.6 times as long as propodeum. Hind legs brownish yellow *S. kunashiri* Belokobylskij

Distribution. Indonesia (Java).

Spathius kunashiri Belokobylskij, 1998
 (Figs 348–360)

Spathius kunashiri Belokobylskij, 1998: 90.

Material. Holotype: female, Russia, Kuril Is. “Kunashir, Aliokhino, smesh. [annyi] les, 31 VII [1]981, Belokobylskij” (ZISP).

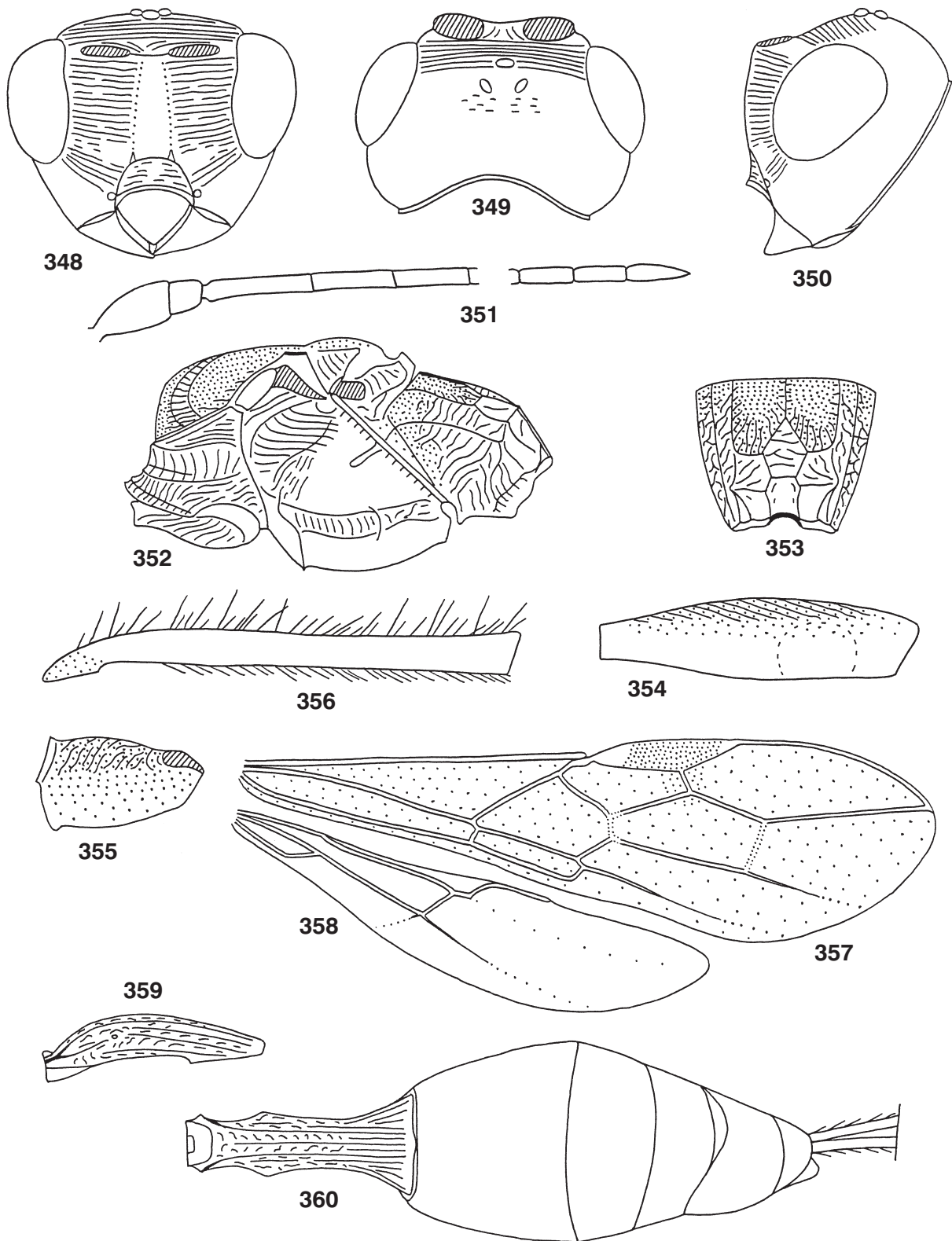
Paratype. 1 female, Russia, Kuril Is. “vlk. Golovnina, Kunashir, poliany, Belokob[y]lskij, 26 VII [1]981” (ZISP)

Description. Female. Body length 3.2–4.0 mm; fore wing length 2.5–3.1 mm. Head not depressed, its width 1.5–1.6 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.6–1.9 times length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 1.25 times Od, 0.4 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height about 0.5 times eye height and 1.0–1.2 times basal width of mandible. Face width 1.2 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather large and round, its width almost equal to distance from edge of depression to eye, about 0.4 times width of face. Occipital carina absent near mandible at short distance and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow, but distinct. Vertex convex.

Antennae slender, filiform, 29-segmented, 1.2 times as long as body. Scape almost twice as long as maximum width. First flagellar segment 4.5–4.8 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 3.3 times as long as wide, 0.5 times as long as first tergite, 0.9 times as long as apical segment; the latter distinctly pointed apically.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel distinct, posterior branch widely fused with posterior margin of pronotum; anterior branch situated nearly middle of pronotum. Pronotum subanteriorly with distinct curved transverse carina. Pronotal lateral depression rather wide, shallow, incompletely (but distinctly) marginate, sparsely crenulate. Mesoscutum distinctly and almost perpendicularly raised above pronotum. Notauli deep, complete, narrow, densely crenulate. Prescutellar depression deep, wide, with 5 carinae, finely rugulose, 0.3 times as long as scutellum. Scutellum convex, without lateral carinae. Metanotum with short wide pointed tooth. Subalar depression shallow, wide, rugose-striate. Sternauli narrow, rather deep, strongly curved, densely crenulate, running along entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and wide. Propodeum with small wide pointed lateral tubercles.

Wings. Fore wing 3.3 times as long as wide. Pterostigma 4 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 3.7 times first abscissa and forming distinct angle with it, 0.4–0.5 times third abscissa, 0.9–1.2 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 2.5–2.7 times maximum width, 1.3 times length of brachial cell. Recurrent vein 2.3–4.0 times second abscissa of medial vein. Distance from nervulus to basal vein 0.2 times nervulus length. Nervulus almost perpendicular to anal



Figures 348–360. *S. kunashiri*: (348) head, frontal view, (349) head, dorsal view, (350) head, lateral view, (351) basal and apical segments of antenna, (352) mesosoma, lateral view, (353) propodeum, (354) hind femur, (355) hind coxa, (356) hind tibia, (357) fore wing, (358) hind wing, (359) petiole, lateral view, (360) metasoma, dorsal view.

vein. Brachial cell closed distinctly before level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{2}{3}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5 times as long as maximum width. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.6–0.7 times second abscissa. Recurrent vein long, oblique, unsclerotized, antefurcal.

Legs. Fore tibia with rather dense thick numerous spines arranged in rather wide stripe. Hind coxa rather long (its length 1.7 times maximum width), with distinct basoventral tooth and corner. Hind femur 3.5–3.8 times as long as wide. Hind tibia apically without distinct spines on outer side. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.0–2.3 times its apical width, 1.5–1.6 times length of propodeum; apical width 1.5–1.6 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.4–1.6 times basal width of second tergite, 0.8–0.9 times their maximum width. Ovipositor straight. Ovipositor sheaths 0.5–0.6 times as long as metasoma, 1.4–1.5 times as long as petiole, 0.8 times as long as mesosoma, 0.35–0.40 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, but with very fine transverse striation in medio-anterior $\frac{2}{3}$. Frons densely and coarsely transversely striate. Face finely and distinctly rugulose-striate, narrowly smooth medially. Temple smooth. Mesoscutum very densely and distinctly granulate, with fine or very fine and rather short rugae near notauli, with 2 convergent carinae medioposteriorly and rugulosity between and around carinae. Scutellum almost smooth, but finely or very finely granulate on posterior small area. Mesopleura widely smooth, sometimes with very fine sculpture posteriorly. Propodeum with distinctly marginate areas, areola rather small and short, pentagonal; petiolate area rather short, distinctly separated from areola by high carina; propodeum distinctly densely granulate-rugose, smooth in posterior $\frac{1}{4}$; basal carina 1.2–1.7 times as long as fork of areola. Hind coxa densely granulate with fine striation dorsally. Hind femur finely and distinctly striate in upper $\frac{1}{3}$, narrowly coriaceous medio-laterally, almost smooth ventrally. Petiole sparsely striate in basal $\frac{3}{4}$ and with dense rugosity between striae, densely striate in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with rather dense, long, semi-erect hairs along notauli and marginally. Mesopleura widely bare. Dorsal surface of hind tibia

with long rather dense and semi-erect hairs, their length 0.8–1.0 times maximum apical width of tibia.

Colour. Head, mesosoma and petiole dark reddish brown to black; rest metasoma reddish brown, brownish yellow below and on apical margins of third-sixth tergites. Two basal segments of antenna yellow, then segments brownish yellow, distinctly darkened toward middle, 17th–28th (13 subapical) segments pale yellow, apical segment dark brown. Palpi yellow. Legs yellow to brownish yellow, hind femur with large brown spot in apical half; hind tibia yellow, pale yellow basally. Ovipositor sheath dark brown, brownish yellow basally. Fore wing faintly infusate. Pterostigma brown, pale in basal $\frac{1}{3}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. bion* Nixon (Nixon 1943: couplet 28, page 207). The differences between these species are indicated in the following key:

- 28a. Upper part of head dark reddish brown. Propodeum with small protuberances. Hind femur brown only on spot in apical half. Antenna rather slender and long. Anterior branch of pronotal keel distinct. Parallel vein of fore wing not interstitial. Fore wing faintly infusate *S. kumashiri* Belokobylskij
- Upper part of head pale yellow to dirty yellow. Propodeum with conspicuous protuberances. Hind femur brown throughout. Antenna rather thick and short. Anterior branch of pronotal keel distinctly developed. Parallel vein of fore wing interstitial. Fore wing intensively infusate *S. bion* Nixon

This species is also similar to *S. ninus* Nixon (Nixon 1943: couplet 48 on page 209); their differences are indicated in the following key:

- 48a. Wings faintly infusate. Frons entirely coarsely striate. Pronotal keel distinct. Scutellum almost smooth at most part. Recurrent vein strongly postfurcal. Propodeum dull. Petiole 1.5 times as long as propodeum *S. kumashiri* Belokobylskij
- Wings intensively infusate. Frons with traces of delicate striation. Pronotal keel fine. Scutellum evenly granulate. Recurrent vein weakly postfurcal. Propodeum very shining. Petiole a little less than twice as long as propodeum *S. ninus* Nixon

Additionally, this species is similar to *S. helle* Nixon (Nixon 1943: couplet 51, page 209); their differences are indicated in the following key:

- 51a. Mesosoma and head almost entirely dark reddish brown to black. Face rather dull, coarsely sculptured. Scutellum almost entirely smooth. Length of hairs on dorsal surface of hind tibia 0.8–1.0 times maximum width of tibia. Dorsal areas of propodeum coarsely sculptured. Malar space shorter, 0.5 times as high as eye. Hind tibia apically without spines. Apical part of antenna with 13 pale yellow segments *S. kumashiri* Belokobylskij
- Mesosoma with large yellowish spots; head yellowish brown. Face very shining, finely sculptured. Scutellum

entirely granulate. Length of hairs on dorsal surface of hind tibia 1.5–1.7 times maximum width of tibia. Dorsal areas of propodeum less coarsely sculptured. Malar space longer, 0.7 times as high as eye. Hind tibia apically with 2 spines on outer side. Apical part of antenna with 5–8 pale yellow segments *S. helle* Nixon

Distribution. Russia (Kuril Is.), Japan (Honshu).

Spathius leschii Belokobylskij, 1998

(Figs 361–373)

Spathius leschii Belokobylskij, 1998: 92.

Material. Holotype: female, Russia, “Primorskii krai, zap.[ovednik] “Kedrovaya Pad”, dubniak, 20 VIII 1979, Belokobylskij” (ZISP).

Paratypes. Russia: 22 females and 18 males from Primorskii krai and Kuril Is.

Description. Female. Body length 1.9–3.8 mm; fore wing length 2.0–2.8 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.3–1.5 times length of temple. Ocelli small, in almost equilateral triangle; POL 1.1–1.3 times Od, 0.3–0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.45–0.50 times eye height and 0.8–1.0 times basal width of mandible. Face width 1.3–1.4 times eye height and 1.2–1.3 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression medium size and round, its width 0.8–1.0 times distance from edge of depression to eye, about 0.4 times width of face. Occipital carina complete below near mandible and fused with hypostomal carina, complete dorsally. Hypostimal flange narrow. Vertex convex.

Antennae slender, filiform, 21–28-segmented, about 1.2 times as long as body. Scape 1.4–1.6 times as long as maximum width. First flagellar segment 4.0–4.5 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 3.5–4.0 times as long as wide, 0.6 times as long as first tergite, 0.8–1.0 times as long as apical segment; the latter pointed apically.

Mesosoma. Length of mesosoma almost twice its height. Pronotal keel distinct, posterior branch shortly fused with posterior margin of pronotum; anterior branch situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression wide, rather deep, almost completely marginate, coarsely crenulate, but almost smooth posteriorly. Mesoscutum almost perpendicularly and highly raised above pronotum. Notauli rather deep, complete, narrow, coarsely and sparsely crenulate. Prescutellar depression shallow, wide, with median carina, coarsely and sparsely rugulose, about 0.4 times as long as almost scutellum. Scutellum almost flat, with fine lateral carinae. Metanotum with wide pointed tooth. Subalar depression rather shallow, wide, coarsely rugose-stri-

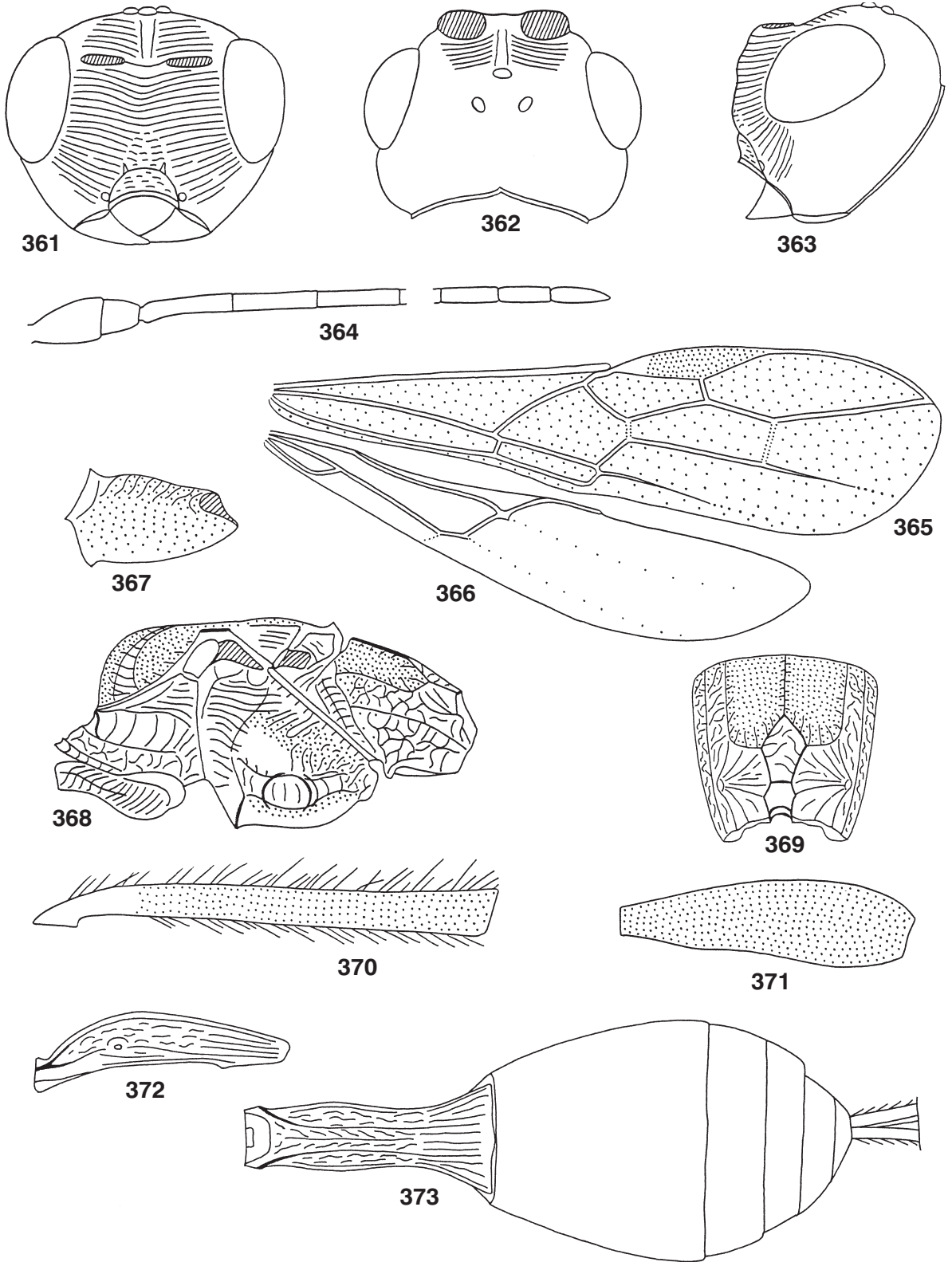
ate. Sternauli wide in anterior half, narrow in posterior half, rather deep, weakly S-shaped, sparsely crenulate, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum with distinct lateral tubercles.

Wings. Fore wing 3.5 times as long as wide. Pterostigma 4.0–4.2 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.2–1.3 times as long as pterostigma. Second radial abscissa 2.7–3.3 times first abscissa and forming distinct angle with it, 0.35–0.50 times third abscissa, 0.8–1.0 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 2.5–3.0 times maximum width, 1.4–1.6 times length of brachial cell. Recurrent vein 2.8–3.5 times second abscissa of medial vein. Distance from nervulus to basal vein 0.4–0.7 times nervulus length. Nervulus almost perpendicular to anal vein. Brachial cell closed weakly behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.0–5.2 times as long as wide. First costal abscissa 0.50–0.55 times second abscissa. First abscissa of medio-cubital vein 0.6 times second abscissa. Recurrent vein long, unsclerotized, strongly oblique, antefurcal.

Legs. Fore tibia with rather dense slender numerous spines arranged almost in one row. Hind coxa medium size (its length 1.5–1.7 times maximum width), with basoventral tooth and corner. Hind femur elongate-oval, 3.5–3.8 times as long as wide. Hind tibia apically without spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.15 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, distinctly and more or less regularly curved dorsally, thickened in basal half; distinctly widened in apical $\frac{1}{5}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.2–2.7 times its apical width, 1.5–1.8 times length of propodeum; apical width 1.5–1.7 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.4–1.6 times basal width of second tergite, 0.8–1.0 times their maximum width. Ovipositor straight. Ovipositor sheaths 0.6–0.7 times as long as metasoma, 1.4–1.6 times as long as petiole, 0.8–0.9 times as long as mesosoma, 0.40–0.45 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, but often very finely transversely striate laterally or in posterior $\frac{1}{4}$. Frons finely and regularly transversely striate. Face coarsely transversely striate. Temple smooth. Mesoscutum densely granulate, with short and fine rugae near



Figures 361–373. *S. leschii*: (361) head, frontal view, (362) head, dorsal view, (363) head, lateral view, (364) basal and apical segments of antenna, (365) fore wing, (366) hind wing, (367) hind coxa, (368) mesosoma, lateral view, (369) propodeum, (370) hind tibia, (371) hind femur, (372) petiole, lateral view, (373) metasoma, dorsal view.

notauli and laterally, coarsely rugose in small medioposterior area. Scutellum densely and distinctly granulate. Mesopleura rugulose-striate at most part, sometimes rugulosity fine, with small smooth antero-median area. Propodeum with distinctly marginate areas; areola short and pentagonal, petiolate area long, distinctly separated from areola by high carina; anterolateral areas of propodeum densely granulate with rugulosity along carinae, rest of propodeum rather coarsely rugose-striate; basal carina 1.5–2.5 times as long as fork of areola. Hind coxa densely granulate, additionally rugose-striate dorsally. Hind femur finely and densely granulate. Petiole coarsely and densely rugose-striate with ground granulate sculpture. Rest of tergites smooth. Mesoscutum with rather dense, long, semi-erect hairs along notauli and marginally. Mesopleura widely bare. Dorsal surface of hind tibia with long, rather dense and semi-erect hairs, their length 0.7–1.2 times maximum width of tibia.

Colour. Body dark reddish brown to black, with red spots. Antenna brownish yellow basally, then reddish brown to black, 5–8 subapical segments yellow or pale yellow, 2–3 apical segments dark brown. Palpi pale yellow. Legs brownish yellow, hind femur widely brown on submedian part; hind tibia brownish yellow, paler basally. Ovipositor sheath light brown in basal half, almost black in apical half. Fore wing faintly infusate. Pterostigma brown, yellow in basal $\frac{1}{4}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. moscus* Nixon and *S. fasciatus* Walker (Nixon 1943: couplet 24a, page 207). Their differences are indicated in the following key:

- 24a. Hairs of upper surface of hind tibia virtually erect. Hind femora strongly infusate towards apex on each side *S. moscus* Nixon
 –. Hairs of upper surface of hind tibia semi-erect. Hind femora hardly infusate towards apex on each side **24b**
 24b. Ovipositor sheath 0.6–0.7 times as long as metasoma. First flagellar segment 4.0–4.5 times as long as apical width. Antennae subapically with pale segments. Mesopleura medially sculptured at most part
 *S. leschii* Belokobylskij
 –. Ovipositor sheath about as long as metasoma. First flagellar segment 5.0–6.0 times as long as apical width. Antennae subapically without pale segments. Mesopleura medially smooth at most part *S. fasciatus* Walker

S. leschii Belokobylskij is also similar to *S. asander* Nixon (Nixon 1943: couplet 26, page 207); their differences are indicated in the following key:

- 26a. Ovipositor longer than metasoma. Mesonotum sloping gradually to pronotum. Mesonotal hairs erect. Basal carina of propodeum very short, 0.20–0.25 times as long as fork of areola. Mesopleura medially more or less smooth *S. asander* Nixon
 –. Ovipositor distinctly shorter than metasoma. Mesonotum almost perpendicularly raised above pronotum. Mesonotal hairs semi-erect. Basal carina of propodeum

long, 1.2 times as long as fork of areola. Mesopleura medially sculptured at most part *S. leschii* Belokobylskij

Additionally, this species is similar to *S. ninus* Nixon (Nixon 1943: couplet 49, page 209); their differences are indicated in the following key:

- 48a. Temple short (fig. 63, p. 241, in Nixon 1943). Pronotal keel very fine. Mesopleura submedially almost smooth
 *S. ninus* Nixon
 –. Temple longer. Pronotal keel distinct. Mesopleura submedially sculptured at most part *S. leschii* Belokobylskij

Distribution. Russia (Primorskii krai, Kuril Is.), Korea.

Spathius lesovik Belokobylskij, 1998
 (Figs 374–386)

Spathius lesovik Belokobylskij, 1998: 92.

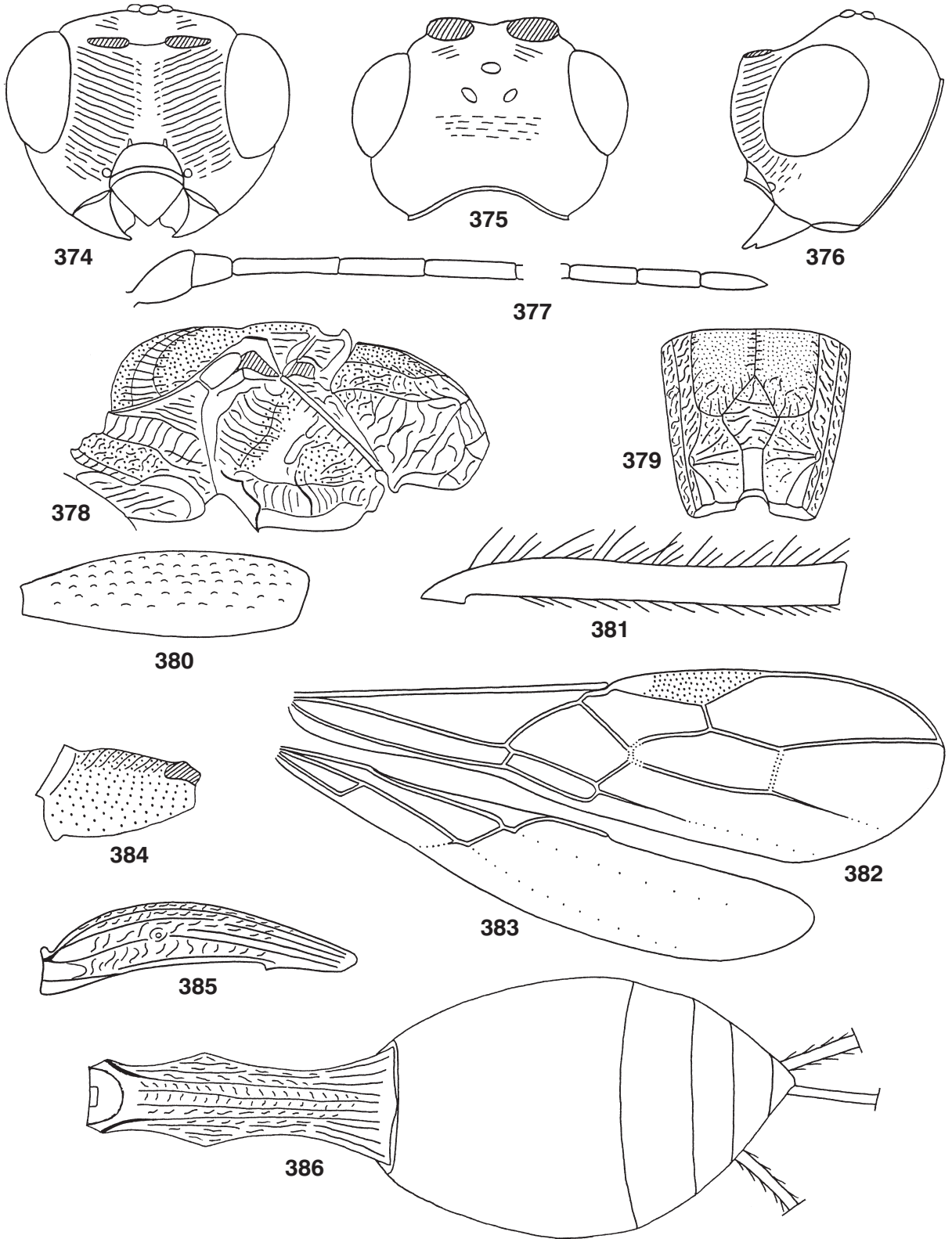
Material. Holotype: female, Russia, “Primorskii krai, Spassk[-Dal’nii], shir.[okolistvennyi] les, Belokobylskij, 7 IX 1984” (ZISP).

Paratypes. Russia: 11 females from Primorskii krai. Japan: 1 female from Kyushu.

Description. Female. Body length 2.1–2.7 mm; fore wing length 2.0–2.2 mm. Head not depressed, its width 1.5–1.7 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.4–1.6 times length of temple. Ocelli small, in triangle with base 1.1–1.2 times its sides; POL 1.3–1.4 times Od, 0.40–0.45 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4–0.5 times eye height and 0.8–1.0 times basal width of mandible. Face width 1.1–1.2 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8–1.0 times distance from edge of depression to eye, 0.35–0.40 times width of face. Occipital carina complete below near mandible, fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Vertex convex.

Antennae slender, filiform, 22–24-segmented, 1.3 times as long as body. Scape 1.5–1.7 times as long as maximum width. First flagellar segment 4.7–5.0 times as long as its apical width, 1.1 times as long as second segment. Penultimate segment 3.0–3.3 times as long as wide, 0.6 times as long as first tergite, 0.8–1.0 times as long as apical segment; the latter pointed apically.

Mesosoma. Length of mesosoma twice its height. Pronotal keel distinct, posterior branch rather widely fused with posterior margin of pronotum; anterior branch fine and situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather wide, deep, indistinctly marginate, sparsely crenulate anteriorly and almost smooth posteriorly. Mesoscutum distinctly and roundly raised above pronotum. Notauli rather deep, complete,



Figures 374–386. *S. lesovik*: (374) head, frontal view, (375) head, dorsal view, (376) head, lateral view, (377) basal and apical segments of antenna, (378) mesosoma, lateral view, (379) propodeum, (380) hind femur, (381) hind tibia, (382) fore wing, (383) hind wing, (384) hind coxa, (385) petiole, lateral view, (386) metasoma, dorsal view.

narrow, coarsely crenulate. Prescutellar depression shallow, rather wide, with 3–4 carinae, very finely coriaceous, 0.4 times as long as scutellum. Scutellum almost flat, with fine lateral carinae. Metanotum with short pointed tooth. Subalar depression shallow, wide, densely rugose-striate with granulations. Sternauli rather wide, deep in anterior half, shallow in posterior half, weakly S-shaped, coarsely crenulate and with additional granulation in posterior half, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum with small obtuse lateral tubercles.

Wings. Fore wing 3.0–3.2 times as long as wide. Pterostigma 4.3–4.5 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 3.2–3.8 times first abscissa and forming distinct angle with it, 0.5 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 2.7–3.0 times maximum width, 1.6–1.8 times length of brachial cell. Recurrent vein about 3.0 times second abscissa of medial vein. Distance from nervulus to basal vein 0.5–1.0 times nervulus length. Nervulus almost perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.0–5.4 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein rather short, unsclerotized, oblique, antefurcal.

Legs. Fore tibia with rather sparse thick numerous spines arranged almost in one row. Hind coxa rather long (its length 1.6–1.7 times maximum width), with small basoventral tooth and distinct corner. Hind femur elongate-oval, 3.2–3.5 times as long as wide. Hind tibia apically without spines on outer side. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.1–1.2 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened in basal half; widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles almost in basal third. Length of petiole 2.0–2.5 times its apical width, 1.5–1.7 times length of propodeum; apical width 1.3–1.5 times (rarely almost equal) width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.4–1.5 times basal width of second tergite, 0.8–0.9 times their maximum width. Ovipositor straight. Ovipositor sheaths 0.35–0.45 times as long as metasoma, 0.8–1.1 times as long as petiole, 0.5–0.6 times as long as mesosoma, 0.2–0.3 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, but often medially very finely coriaceous-striate. Frons smooth at most part, finely striate near antennal sockets. Face densely transversely striate, rugose medially, sometimes almost smooth below at middle. Temple smooth. Mesoscutum densely granulate, with short and fine rugae near notauli, with 2 distinctly convergent carinae medio-posteriorly and rugosity between carinae. Scutellum entirely densely and distinctly granulate. Mesopleura smooth or almost smooth on large median area, rugulose-coriaceous in below anterior and posterior parts. Propodeum with distinctly marginate areas, areola medium size or rather large, pentagonal; petiolate area long, narrow, distinctly separated from areola by high carina; basolateral areas of propodeum densely granulate with rugulosity along carinae, rest of propodeum coarsely rugose-striate; basal carina 0.8–1.5 times as long as fork of areola. Hind coxa densely granulate with additional rugosity dorsally. Hind femur finely coriaceous, very finely coriaceous below, with distinct transverse striae dorsally. Petiole rugose-striate, smooth on rather large apical part. Rest of tergites smooth. Mesoscutum with rather dense, long, semi-erect hairs along notauli and marginally. Mesopleura widely bare. Dorsal surface of hind tibia with long, rather dense and semi-erect hairs, their length 0.8–1.2 times maximum width of tibia.

Colour. Body reddish brown to light reddish brown, metasoma sometimes ventrally brownish yellow. Antenna brownish yellow basally, darkened toward middle, dark brown submedially, 5–7 subapical segments (from 17th–18th to 22th–24th) pale yellow, apical segment brown. Palpi pale yellow. Legs yellow, faintly infusate basally; hind femur brownish yellow; hind tibia entirely brownish yellow. Ovipositor sheath brown, paler basally. Fore wing evenly faintly infusate. Pterostigma brown, yellow in basal $\frac{1}{4}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. helle* Nixon (Nixon 1943: couplet 51, page. 209). Their differences are indicated in the following key:

- 51a. Hairs of upper surface of hind tibia almost erect, long, 1.5–1.7 times as long as maximum width of tibia. Nervulus interstitial. Length of petiole almost twice its apical width. Frons distinctly entirely striate. Basal carina of propodeum 0.6 times as long as fork of areola. Head at most part and mesoscutum brownish yellow *S. helle* Nixon
 –. Hairs of upper surface of hind tibia semi-erect, shorter, 0.8–1.2 times as long as maximum width of tibia. Nervulus distinctly postfurcal. Length of petiole 2.5 times its apical width. Frons entirely smooth. Basal carina of propodeum almost as long as fork of areola. Head and mesoscutum reddish brown, paler partly *S. lesovik* Belokobylskij

S. lesovik Belokobylskij is very similar to *S. leschii* Belokobylskij; their differences are indicated in the following key:

1. Ovipositor sheath 0.8–1.0 times as long as mesosoma, 0.40–0.45 times as long as fore wing. Areola of propodeum less; basal carina 2.0–2.5 (rarely 1.5 or 3.0) times as long as fork of areola *S. leschii* Belokobylskij
 –. Ovipositor sheath 0.5–0.7 times as long as mesosoma, 0.25–0.33 times as long as fore wing. Areola of propodeum larger; basal carina usually 0.8–1.0 times (rarely 1.2–1.5) times as long as fork of areola *S. lesovik* Belokobylskij

Distribution. Russia (Primorskii krai), Korea, Japan (Kyushu).

Spathius pellitus Enderlein, 1912
 (Figs 387–398)

Spathius pellitus Enderlein 1912, 5; Nixon 1943: 442; Shenefelt and Marsh 1976: 1412.

Material. Holotype: female, “Sumatra, Soekaranda, Dr. H. Dohrn S.,” “Type” (reddish), “*Spathius pellitus* Enderl., ♀, Type, Dr. Enderlein det. 1912”, “Mus. Zool. Polonicum, Warszawa 12/45” (MIZW).

Description. Female. Body length 5.4 mm; fore wing length 3.8 mm. Head not depressed, its width 1.6 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 0.8 times Od, 0.3 times OOL. Eye glabrous, 1.25 times as high as broad. Malar space height 0.4 times eye height and 0.7 times basal width of mandible. Face width 1.1 times eye height and 1.15 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 1.1 times distance from edge of depression to eye, 0.5 times width of face. Occipital carina fused with hypostomal carina by additional carina, complete dorsally. Hypostimal flange rather wide. Vertex convex.

Antennae slender, filiform, more than 32-segmented (apical segments missing). Scape 1.7 times as long as wide. First flagellar segment 6.5 times as long as its apical width, 1.25 times as long as second segment. Subapical segments about 4.0 times as long as wide.

Mesosoma not depressed. Length of mesosoma about twice its height. Pronotal keel distinct, posterior branch shortly fused medially with posterior margin of pronotum; anterior branch strong, situated almost on middle of pronotum. Pronotum without subanterior carina. Pronotal lateral depression wide, deep, marginate, coarsely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, more shallow posteriorly, complete, coarsely crenulate. Prescutellar depression deep, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum weakly convex and with fine lateral carinae. Subalar depression shallow, wide, rugose-striate, but almost smooth partly. Sternauli deep in anterior $\frac{2}{3}$, shallow in posterior $\frac{1}{3}$, S-shaped, crenulate, running along entire length of lower part of meso-

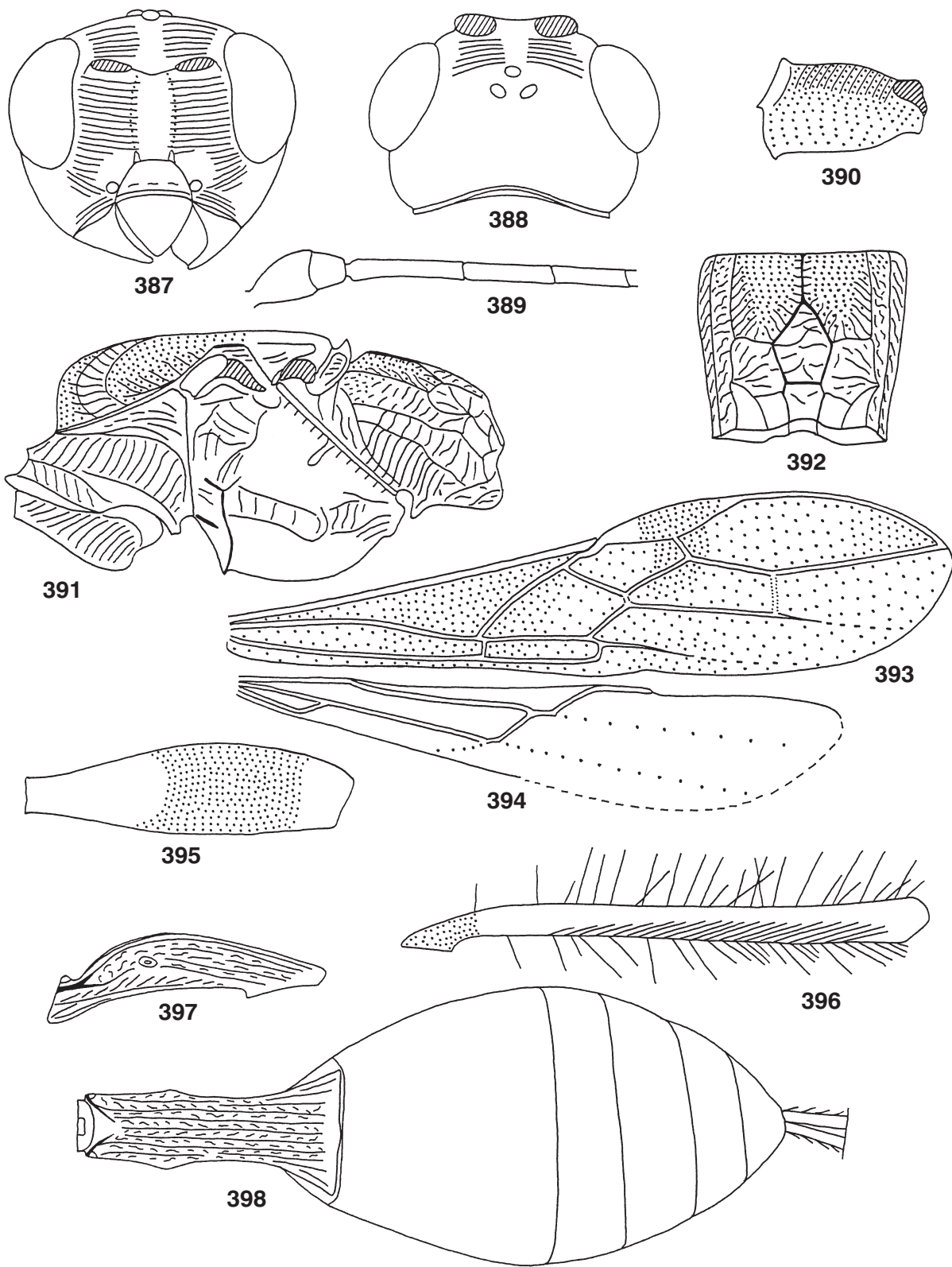
pleura. Postpectal carina absent. Metanotum with distinct pointed short tooth. Metapleural flange narrow and rather long. Propodeum with small lateral tubercles.

Wings. Fore wing 4.0 times as long as wide. Pterostigma 4.2 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.0 times first abscissa and forming obtuse angle with it, 0.5 times straight third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.4 times maximum width, 1.3 times length of narrow brachial cell. Recurrent vein almost 4.0 times second abscissa of medial vein. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.15 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of brachial vein. Mediocubital vein almost not curved to anal vein in distal half. Hind wing 4.5 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.5 times second abscissa. Recurrent vein unsclerotized, antefurcal, curved.

Legs. Fore tibia with dense rather numerous spines arranged in one row. Hind coxa rather small (its length 1.7 times maximum width), with basoventral tooth and corner. Hind femur 3.5 times as long as wide. Hind tibia apically with 2 spines on outer side. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.55 times as long as basitarsus, 1.2 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with distinct spiracular tubercles in basal third. Length of petiole twice its apical width, 1.5 times length of propodeum; apical width 1.7 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.3 times basal width of second tergite, 0.7 times their maximum width. Ovipositor sheath 0.7 times as long as metasoma, 1.8 times as long as petiole, 0.5 times as long as fore wing, almost as long as mesosoma.

Sculpture and pubescence. Vertex smooth. Frons coarsely and almost entirely striate. Face coarsely striate, almost smooth medially on narrow part. Temple smooth. Mesoscutum with long coarse and dense striae along notauli and laterally, with dense and fine granulation medially on narrow areas of lateral lobes and wide area on median lobe. Scutellum smooth. Mesopleura smooth at most part. Metapleura entirely coarsely rugose. Propodeum coarsely and rather sparsely rugose, finely granulate in basal $\frac{1}{4}$, with distinctly marginate areas; areola large and rather wide; petiolate area short, narrowed posteriorly, distinctly separated from areola; basal carina about as long as fork of areola. Hind coxa dorsally semi-



Figures 387–398. *S. pellitus*: (387) head, frontal view, (388) head, dorsal view, (389) 5 basal segments of antenna, (390) hind coxa, (391) mesosoma, lateral view, (392) propodeum, (393) fore wing, (394) hind wing, (395) hind femur, (396) hind tibia, (397) petiole, lateral view, (398) metasoma, dorsal view.

circularly striate and with fine granulation, finely granulate-coriaceous on rest part. Hind femur smooth. Hind tibia smooth dorsally, coarsely striate ventrally. Petiole striate, rugulose-striate on median part. Rest of tergites entirely smooth. Mesoscutum with rather sparse, almost erect long hairs situated along notauli and marginally. Hairs on dorsal surface of hind tibia long, rather sparse, erect, their length 1.2–1.5 times maximum width of tibia.

Colour. Head and metasoma behind petiole light reddish brown. Mesosoma and petiole reddish brown to dark reddish brown, mesoscutum yellowish brown. Antennae brownish yellow basally, brown to dark brown at most part, 4 subapical segments yellow. Palpi yellow. Legs yellow, middle femur in lower anterior half and hind femur in anterior $\frac{3}{5}$ brown; hind tibia faintly infuscate basally; tarsi faintly infuscate. Ovipositor sheath yellow in basal $\frac{1}{5}$, dark brown in apical $\frac{2}{5}$. Fore wing faintly infuscate, with small brow spot around first radial abscissa. Pterostigma brown, pale yellow in basal $\frac{1}{4}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group and is very similar to *S. moscus* Nixon (Borneo) (Nixon 1943: couplet 24a, page 207); their differences are indicated in the following key:

- 24b. First flagellar segment long. Recurrent vein weakly post-furcal, almost 4 times as long as second abscissa of medial vein. Basal carina of propodeum longer, about as long as fork of areola. Ovipositor sheaths 0.7 times as long as metasoma. Hind femur elongate oval *S. pellitus* Enderlein
- First flagellar segment shorter. Recurrent vein distinctly postfurcal, 1.5 times as long as second abscissa of medial vein. Basal carina of propodeum shorter, about half as long as fork of areola. Ovipositor sheaths weakly longer than metasoma. Hind femur subclavate *S. moscus* Nixon

This species is also similar to *S. psammenitus* Nixon (Philippines) (Nixon 1943: couplet 26, page 207); their differences are indicated in the following key:

- 26a. Antennae with yellow subapical segments. Mesoscutum rather strongly arising above pronotum. Basal carina of propodeum long, almost as long as fork of areola. Hind femur wide, elongate oval. Ovipositor shorter, ovipositor sheath 0.7 times as long as metasoma *S. pellitus* Enderlein
- Antennae without yellow subapical segments. Mesoscutum rather gradually arising above pronotum. Basal carina of propodeum very short, almost indistinct. Hind femur narrow, clavate. Ovipositor longer, ovipositor sheath as long as metasoma and propodeum combined *S. psammenitus* Nixon

Distribution. Indonesia (Sumatra).

Spathius robustus Belokobylskij, 1998
(Figs 399–410)

Spathius robustus Belokobylskij, 1998: 95.

Material. Holotype: female, Russia, “Khabarovskii krai, 55 km V Birobidzhana, poima R[eki] B[olshoi] In, Zinoviev, 21 VIII 1982” (ZISP).

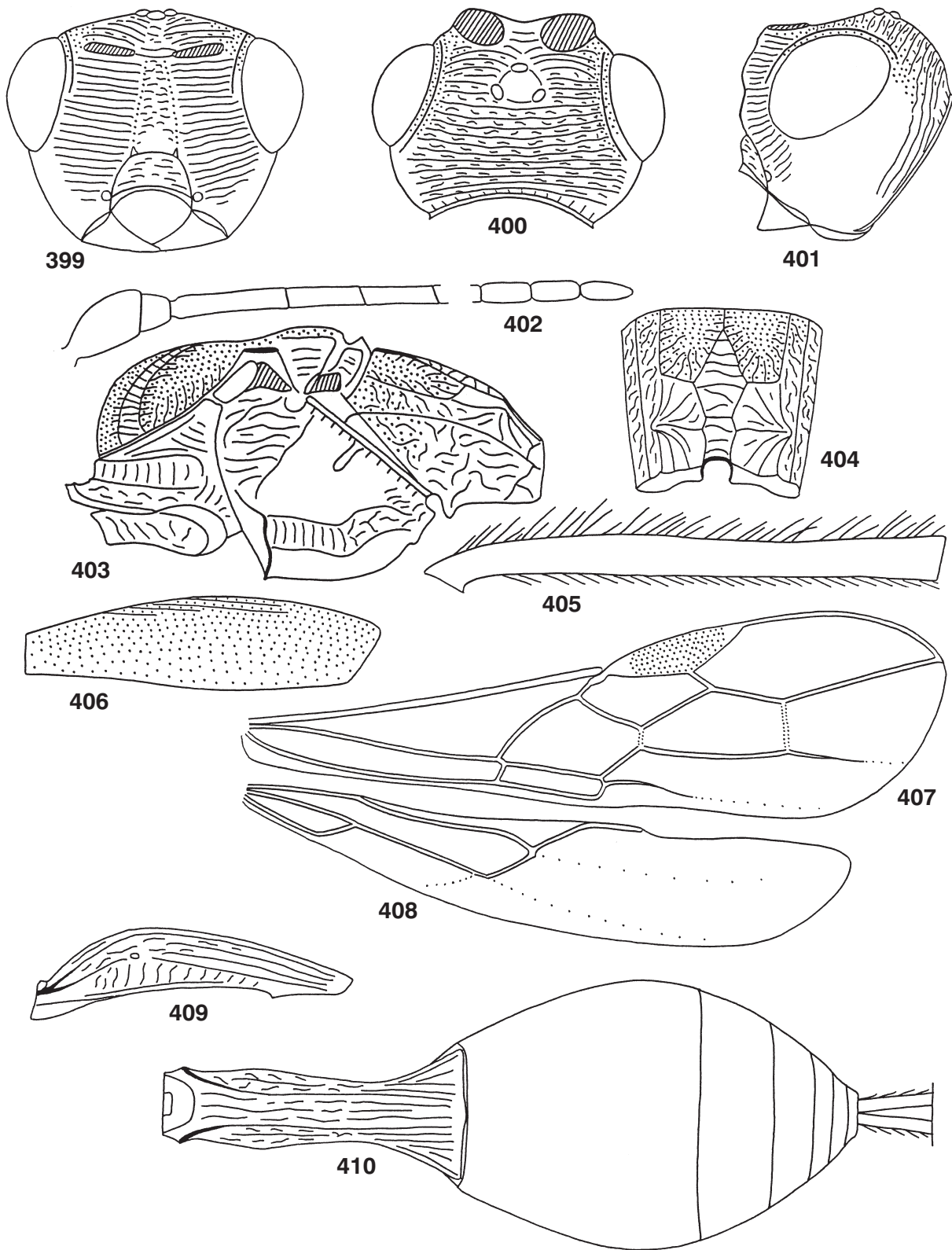
Paratypes. Primorsk Terr.: 1 male, “Suput.[inskii] (=Ussuriyskii) zapovednik, Primorie, les, 26.VII.1972, Kuslitsky” (ZISP); 1 female, “Andreevka, MES, Khasan. [skii] raion, Primorie, Kasparyan, 8 VIII 1978” (ZISP); 1 male, “Primorskii krai, 30 km Yu Slavyanki, les, poliany, 4 VIII 1985, Belokobylskij” (ZISP); 1 female, “Primorskii krai, 20 km VuV Spasska[-Dal’nego], smesh.[annyi] les, opushki, 5.08.1996, S. Belokobylskij” (ZISP).

Description. Female. Body length 3.3–4.4 mm; fore wing length 2.6–3.1 mm. Head not depressed, its width 1.6–1.7 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.3–1.4 times length of temple. Occiput weakly concave. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 1.0–1.2 times Od, about 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.5–0.6 times height of eye and 1.2 times basal width of mandible. Face weakly convex, its width 1.3 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression almost round, its width nearly equal to distance from edge of depression to eye, 0.4 times width of face. Occipital carina fused with hypostomal carina near mandible, complete dorsally. Hypostomal flange wide. Vertex convex.

Antennae slender, filiform, 26–28-segmented. First flagellar segment 4.0–4.5 times as long as its apical width, 1.3–1.4 times as long as second segment. Penultimate segment 3.0 times as long as wide, 0.4 times as long as first segment, slightly shorter than apical segment; the latter pointed apically.

Mesosoma. Length 1.7–1.8 times its height. Pronotal keel distinct, posterior branch shortly fused with posterior margin of pronotum, anterior branch situated submedially. Pronotum subanteriorly with high transverse carina. Pronotal lateral depression distinctly marginate, rather deep and wide, coarsely and sparsely crenulate. Mesoscutum highly and almost perpendicularly raised above pronotum. Notauli deep, wide, complete, coarsely and sparsely crenulate. Prescutellar depression deep, wide, with 3 carinae, almost smooth between carinae, 0.5–0.7 times as long as scutellum. Scutellum weakly convex and with lateral carinae. Metanotum with short thick pointed tooth. Subalar depression shallow, wide, rugose-striate. Sternauli narrow, rather shallow, curved submedially, crenulate, running along entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather short and narrow. Propodeum with short and pointed lateral protuberances.

Wings. Fore wing 3.0–3.5 times as long as wide. Pterostigma 3.0–3.5 times as long as maximum width. Radial vein of fore wing arising from middle of pterostigma. Radial cell not shortened, metacarpus 1.2–1.4 times



Figures 399–410. *S. robustus*: (399) head, frontal view, (400) head, dorsal view, (401) head, lateral view, (402) basal and apical segments of antenna, (403) mesosoma, lateral view, (404) propodeum, (405) hind tibia, (406) hind femur, (407) fore wing, (408) hind wing, (409) petiole, lateral view, (410) metasoma, dorsal view.

as long as pterostigma. Second radial abscissa 3.7–4.2 times first abscissa and forming very obtuse angle with it, about 0.5 times third abscissa, nearly as long as first radiomedial vein. Second radiomedial cell not narrowed distally, its length 2.5–2.8 times maximum width, 1.4–1.5 times length of brachial cell. Recurrent vein 2.0–2.5 times second abscissa of medial vein. Distance from nervulus to basal vein 0.25–0.30 times length of nervulus. Nervulus almost perpendicular to anal vein. Brachial cell closed behind recurrent vein. Parallel vein arising from anterior $\frac{1}{3}$ – $\frac{2}{5}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein. Hind wing 5.0–5.5 times as long as wide. First costal abscissa 0.70–0.75 times second abscissa. First abscissa of mediocubital vein 0.7–0.8 times second abscissa. Recurrent vein long, unsclerotized, oblique, almost interstitial.

Legs. Fore tibia with rather dense, slender numerous spines arranged in one row. Hind coxa rather large and short (its length about 1.5 times maximum width), with small basoventral tooth and distinct corner. Hind femora elongate-oval, 3.3–3.6 times as long as wide. Hind tibia apically with 2–3 slender spines on outer side. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.6 times second-fifth segments combined. Second tarsal segment 0.5 times basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and more or less regularly curved dorsally, distinctly thickened in basal half; distinctly and regularly widened in apical $\frac{1}{5}$ (dorsal view), with fine spiracular tubercles in basal third. Length of petiole 2.2–2.5 times its apical width, 1.5–1.6 times length of propodeum; apical width 1.8 times width at level of spiracles. Second tergite without separated laterotergite. Second suture absent. Median length of second and third tergites combined 1.4–1.5 times basal width of second tergite, 0.8 times their maximum width. Ovipositor straight. Ovipositor sheath 0.7 times as long as metasoma, 1.5–1.7 times as long as petiole, almost as long as metasoma, 0.5 times as long as fore wing.

Sculpture and pubescence. Vertex, frons and face coarsely and undulately transversely striate with rugosity between striae. Temple almost smooth in anterior half, vertically striate in posterior half. Mesoscutum densely granulate, with 2 long convergent striate in medioposterior half; with long coarse rugae at lobes near notauli and laterally, only granulate on lateral lobes in narrow median stripe. Scutellum densely and rather finely granulate. Mesopleura smooth, rugose ventrally and anteriorly, subalar depression striate; prepectus rugulose. Propodeum densely and coarsely rugose, with granulation basally; areas distinctly marginate, areola long and rather narrow, petiolate area long and distinctly separated from areola by high carina; basal carina usually short, 0.4–0.8 times length of fork of are-

ola. Hind coxae coarsely rugose-striate with granulation laterally. Hind femora finely coriaceous, striate dorsally. Petiole rugose-striate. Rest of tergites smooth. Mesoscutum with rather dense, long, semi-erect hairs along notauli and marginally. Mesopleura widely bare. Hairs of dorsal surface of hind tibia semi-erect, dense and rather long, their length almost equal to maximum width of tibia.

Colour. Body reddish brown or dark reddish brown, propodeum, mesomesosoma ventrally, mesoscutum laterally and petiole black. Head yellowish brown. Antennae brownish yellow or light reddish brown, weakly infuscated toward apex, without pale subapical segments. Palpi yellow. Coxae and femora brownish yellow or light reddish brown, rest part of legs pale brown or pale reddish brown; hind tibia yellow, pale yellow in basal $\frac{1}{5}$. Ovipositor sheath light reddish brown, almost black apically. Fore wing almost hyaline, faintly infuscate along several veins. Pterostigma brown, yellow in basal quarter and apically.

Male. Body length 3.4–3.5 mm; fore wing length 2.4–2.6 mm. Vertex more finely striate. Antennae 29–30-segmented. Mesopleura smooth at most part. Second tergite at most part and third tergite medially finely striate. Otherwise similar to female.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. gades* Nixon (Philippine, Indonesia) (Nixon 1943: couplet 49, page 209); their differences are indicated in the following key:

- 49a. Antennae in apical half without pale segments. Temple longer, transverse diameter of eye 1.3–1.4 times length of temple. Pronotal carina fused medially with posterior margin of pronotum. Head distinctly paler than mesosoma *S. robustus* Belokobylskij
 –. Antennae in apical half with 10–11 pale segments. Temple shorter, transverse diameter of eye about twice length of temple. Pronotal carina widely separated from posterior margin of pronotum. Head weakly paler than mesosoma *S. gades* Nixon

This species is also similar to *S. helle* Nixon (Philippine) (Nixon 1943: couplet 51, page 209); their differences are indicated in the following key:

- 51a. Vertex coarsely entirely striate. Propodeum with distinct lateral tubercles. Mesoscutum with coarse and long rugae along notauli and laterally. Hairs of dorsal surface of hind tibia almost as long as maximum width of tibia
 *S. robustus* Belokobylskij
 –. Vertex finely and only partly striate. Propodeum with weak lateral tubercles. Mesoscutum without rugae along notauli and laterally. Hairs of dorsal surface of hind tibia 1.5–1.7 times as long as maximum width of tibia
 *S. helle* Nixon

This species is also similar to the Chinese *S. montivagans* Chao (Chao, 1977) and differs the same characters as

from *S. gades* (but the length of the temple is unknown) and also the short dorsal hairs on the hind tibia.

Distribution. Russia (Khabarovskii and Primorskii kraii).

Spathius rufobrunneus Granger, 1949
(Figs 411–422)

Spathius rufobrunneus Granger, 1949: 151; Shenefelt and Marsh 1976: 1417.

Material. Holotype: female, "Madagascar, Ankaratra, Alt. 1800", "Museum Paris, II-35, A. Seyrig", "28", "Type", "Holotype *Spathius rufobrunneus* Granger" (red) (MNHN).

Description. Female. Body length 3.4 mm; fore wing length 3.0 mm. Head not depressed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.6 times length of temple. Ocelli rather small, in almost equilateral triangle; POL 0.75 times Od, 0.25 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.45 times eye height and almost equal to basal width of mandible. Face width 1.2 times eye height and almost equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.9 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina fused with hypostomal carina below, complete dorsally. Hypostomal flange rather wide.

Antennae slender, filiform, 28-segmented, 1.3 times as long as body. Scape 1.5 times as long as wide. First flagellar segment about 5 times as long as its apical width, 1.1 times as long as second segment. Penultimate segments 3 times as long as wide, 0.6 times as long as first segment, as long as apical segment; the latter weakly pointed apically.

Mesosoma not depressed. Length of mesosoma almost twice its height. Pronotal keel distinct, posterior branch not fused medially with posterior margin of pronotum and rather widely separated from it; anterior branch situated almost on middle of pronotum. Pronotum with fine and distinct subanterior carina. Pronotal lateral depression rather narrow, shallow, marginate, coarsely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, more shallow posteriorly, complete, crenulate. Prescutellar depression deep, rather wide, very finely rugulose, with median carina, 0.3 times as long as scutellum. Scutellum almost flat. Subalar depression shallow, wide, coarsely striate. Sternauli deep in anterior half, shallow in posterior half, S-shaped, crenulate, running along entire length of lower part of mesopleura. Postpectal carina absent. Metanotum with distinct pointed short tooth. Metapleural flange wide and short. Propodeum with small obtuse lateral tubercles.

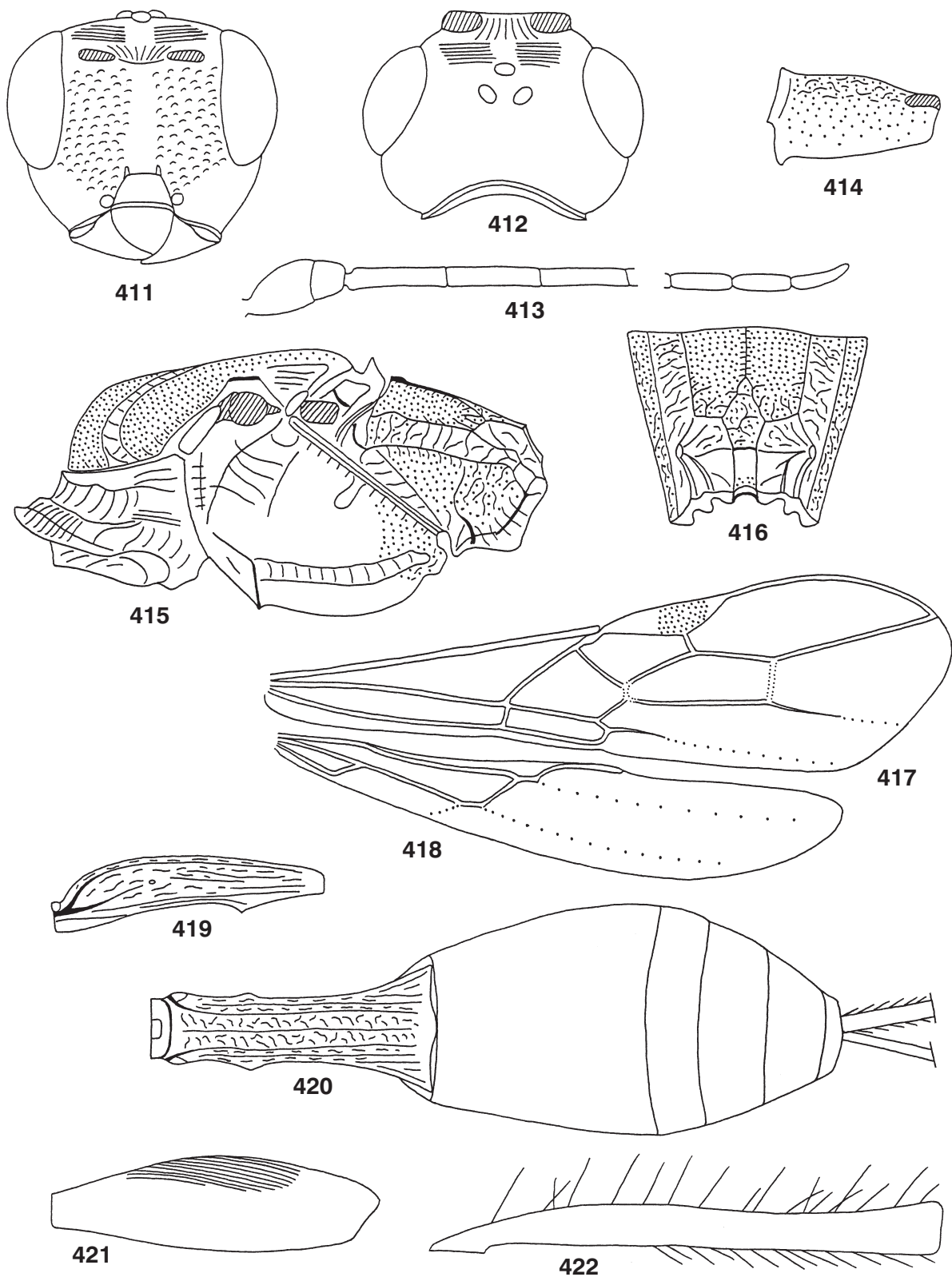
Wings. Fore wing 3.6 times as long as wide. Pterostigma 4.0 times as long as wide. Radial vein aris-

ing distinctly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 4.2 times first abscissa and forming distinct angle with it, 0.45 times straight third abscissa, equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3 times maximum width, 1.6 times length of wide brachial cell. Recurrent vein 3 times second abscissa of medial vein. Nervulus almost perpendicular to anal vein and almost interstitial to basal vein. Parallel vein not interstitial, arising weakly before middle of distal vein of brachial cell. Mediocubital vein almost not curved to anal vein in distal half. Hind wing 5.3 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein unsclerotized, antefurcal, curved.

Legs. Fore tibia with rather dense several spines arranged in narrow stripe. Hind coxa medium size (its length 1.8 times maximum width), with small basoventral tooth and rather distinct corner. Hind femur 3.3 times as long as wide. Hind tibia apically without outer spines. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 0.85 times as long as thickened fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, slightly and regularly curved dorsally, thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with small spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 2.2 times its apical width, 1.5 times length of propodeum; apical width 1.7 times width at level of spiracles, about twice its minimum width. Second and third tergites without separate laterotergites. Second suture absent. Median length of second and third tergites combined 1.4 times basal width of second tergite, 0.9 times their maximum width. Ovipositor straight. Ovipositor sheath 0.85 times as long as metasoma, twice as long as petiole, 1.1 times as long as mesosoma, 0.46 times as long as fore wing.

Sculpture and pubescence. Vertex smooth. Frons finely striate-coriaceous on wide median area, smooth laterally. Face finely striate-granulate, almost smooth medially and laterally. Temple smooth. Mesoscutum densely granulate, without any rugae along notauli and laterally, with 2 undulate and weakly convergent striae and with rugulosity between it in narrow medioposterior part. Scutellum entirely finely coriaceous. Mesopleura smooth at most part, coriaceous posteriorly. Metapleura densely rugulose-granulate. Propodeum with distinctly marginate areas; basolateral areas long, densely granulate and with rugulosity in posterior $\frac{1}{5}$; areola small, pentagonal, rugulose; petiolate area narrow, distinctly separated from areola by high carina; basal carina 1.6 times as long as fork of areola. Hind coxa densely granulate, finely granulate ventrally, with additional transverse dense striae dorsal-



Figures 411–422. *S. rufobrunneus*: (411) head, frontal view, (412) head, dorsal view, (413) basal and apical segments of antenna, (414) hind coxa, (415) mesosoma, lateral view, (416) propodeum, (417) fore wing, (418) hind wing, (419) petiole, lateral view, (420) metasoma, dorsal view, (421) hind femur, (422) hind tibia.

ly. Hind femur smooth, finely striate dorsally. Petiole with almost complete dorsal carinae, rugulose-striate in basal $\frac{3}{4}$, striate in apical $\frac{1}{4}$. Rest of tergites entirely smooth. Mesoscutum with sparse, semi-erect long hairs situated along notauli and marginally. Hairs on dorsal surface of hind tibia long, sparse, almost erect, their length 1.0–1.3 times maximum width of tibia.

Colour. Head yellow, reddish yellow dorsally. Mesosoma and metasoma behind petiole reddish brown; pronotum anteriorly, mesoscutum along notauli, scutellum, metanotum and apex of metasoma reddish yellow or yellowish brown; petiole light reddish brown. Antennae brownish yellow, dark apically. Palpi pale yellow. Legs yellow; hind tibia yellow, faintly dark basally. Ovipositor sheath light brown in basal half, brown in apical half. Fore wing faintly infusate. Pterostigma brown, pale yellow in basal $\frac{1}{4}$ and apically.

Discussion. This species is in the *S. fasciatus* Walker group. Regarding African species, *S. rufobrunneus* Granger is similar to *S. rufithorax* Szépligeti (Nixon 1943: couplet 3, page 205); their differences are indicated in the following key:

- 3a. Hind coxa, femur and tibia yellow. Ocelli in almost equilateral triangle. Mesoscutum densely and distinctly granulate. Basolateral areas of propodeum entirely sculptured, densely granulate with rugulosity in posterior $\frac{1}{3}$. Petiolate area distinctly separated from areola. Petiole short, 1.5 times as long as propodeum. Ovipositor shorter, ovipositor sheath 0.85 times as long as metasoma *S. rufobrunneus* Granger
- Hind coxa reddish brown; hind femur reddish brown completely; hind tibia dark brown and pale basally. Ocelli in triangle with base distinctly longer than sides. Mesoscutum with fine surface sculpture. Basolateral areas of propodeum not entirely sculptured, with transverse rugosity at most part becoming smooth anteriorly. Petiolate area indistinctly separated from areola. Petiole long, twice as long as propodeum. Ovipositor longer, ovipositor sheath as long as metasoma and propodeum combined *S. rufithorax* Szépligeti

This species is similar also to the Philippines *S. erymanthus* Nixon (Nixon 1943: couplet 22, page 206); their differences are indicated below:

- 22a. Areola and petiolate area of propodeum distinctly marginate. Mesopleura without rugae. Petiole short, 1.5 times as long as propodeum. Ovipositor shorter, ovipositor sheath 0.85 times as long as metasoma *S. rufobrunneus* Granger
- Areola and petiolate area of propodeum not marginate mostly. Mesopleura with obsolescent ridges and rugosities. Petiole long, nearly twice as long as propodeum. Ovipositor longer, ovipositor sheath 1.5 times as long as metasoma *S. erymanthus* Nixon

The differences between *S. rufobrunneus* Granger and the Palaearctic *S. fasciatus* Walker (Nixon 1943: couplet 24a, page 207) are as follows:

- 24b. Pronotal keel not fused with posterior margin of pronotum. Ovipositor shorter, ovipositor sheath 0.85 times as long as metasoma. Hairs on dorsal surface of hind tibia longer, their length 1.0–1.3 times maximum width of tibia *S. rufobrunneus* Granger
- Pronotal keel distinctly fused with posterior margin of pronotum. Ovipositor longer, ovipositor sheath weakly longer than metasoma. Hairs on dorsal surface of hind tibia shorter, their length less than maximum width of tibia *S. fasciatus* Walker

Distribution. Madagascar.

Spathius rufotestaceus Motschoulsky, 1863

(Figs 423–432)

Spathius rufotestaceus Motschoulsky, 1863: 31; Nixon 1943: 444; Shenefelt and Marsh 1976: 1417.

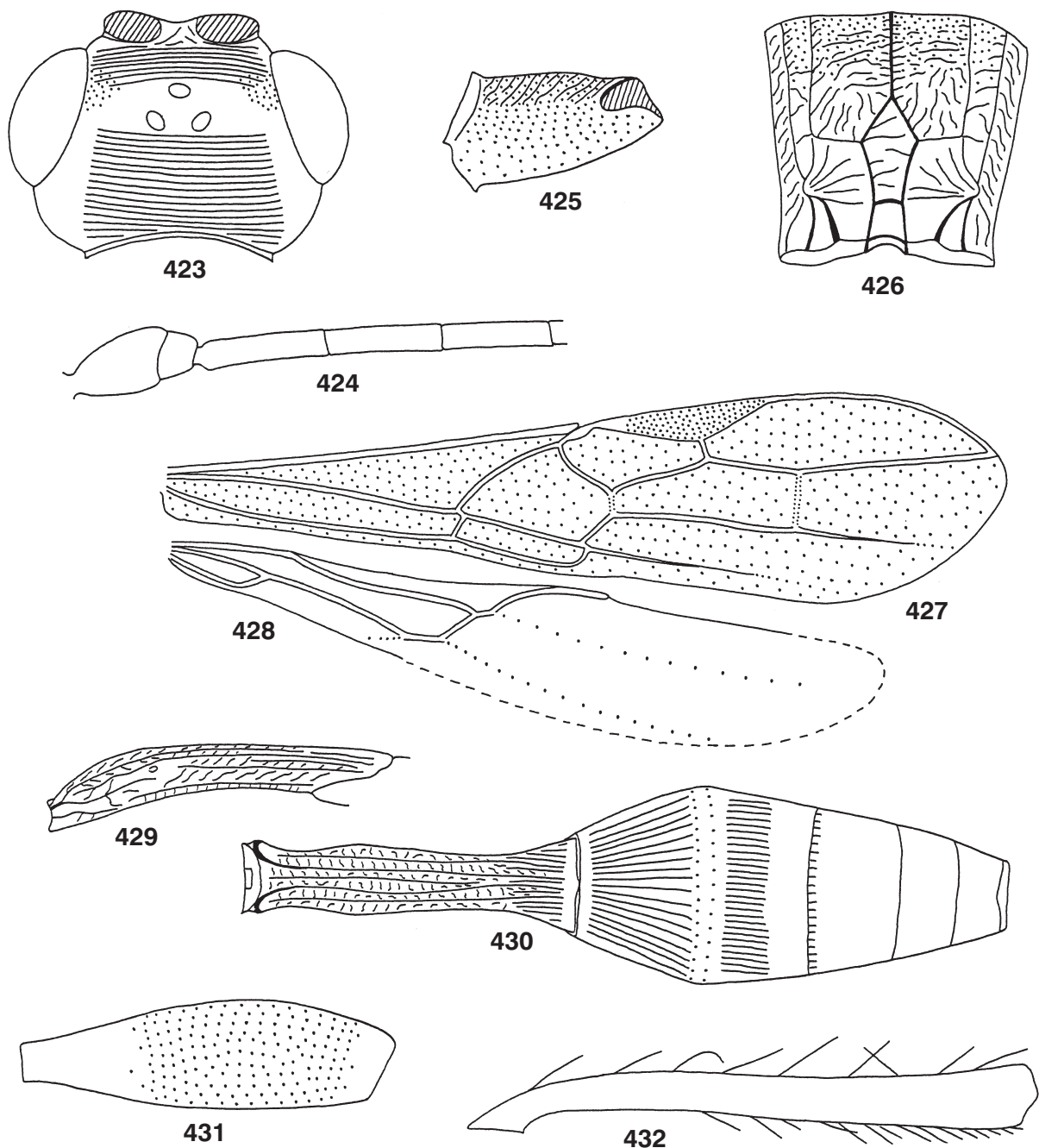
Material. Holotype: female, reddish square, yellow circle with unclear sign, “Type”, “*Spathius rufotestaceus* Motsch., J. W. Ceyl. Mt. N. E.” (= “Des Montagnes de Nura-Ellia”) (yellow label, handwriting by Motschoulsky), “Zool. Museum Moscow Univ.” (ZMMU).

Description. Male. Body length 3.4 mm; fore wing length 2.7 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli rather small, in an equilateral triangle; POL about 0.8 times Od, about 0.3 times OOL. Eye glabrous, 1.2 times as high as broad. Face width 1.2 times as long as eye height. (All other structure covered by glue and it is impossible to study it).

Antennae slender, filiform, more than 11-segmented (apical segments missing). First flagellar segment 5.0 times as long as its apical width, almost as long as second segment. Median segments about 4.0 times as long as wide.

Mesosoma not depressed. Length of mesosoma almost twice its height. Pronotal keel distinct, posterior branch widely fused with posterior margin of pronotum; anterior branch situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression wide, long, marginate, coarsely and rather sparsely crenulate. Mesoscutum rather highly and roundly raised above pronotum. Notauli deep, wide, complete, crenulate. Prescutellar depression rather shallow, with 3 carinae, rugulose, about 0.4 times as long as scutellum. Scutellum weakly convex. Sternauli deep, narrow, S-shaped, crenulate, running along entire length of lower part of mesopleura. Subalar depression shallow, rugose-striate. Metanotum with short and pointed tooth. Metapleural flange short and narrow. Propodeum with small, but distinct lateral tooth.

Wings. Fore wing almost 4.0 times as long as wide. Pterostigma 5.3 times as long as wide. Radial vein arising behind middle of pterostigma. Radial cell not shortened; metacarpus 1.3 times as long as pterostigma. Second radial abscissa 5.3 times first abscissa and



Figures 423–432. *S. rufotestaceus*: (423) head, dorsal view, (424) 5 basal segments of antenna, (425) hind coxa, (426) propodeum, (427) fore wing, (428) hind wing, (429) petiole, lateral view, (430) metasoma, dorsal view, (431) hind femur, (432) hind tibia.

forming obtuse angle with it, 0.5 times third abscissa, equal to first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 2.7 times maximum width, 1.4 times length of brachial cell. Recurrent vein 2.5 times second abscissa of medial vein. Nervulus almost perpendicular to anal vein. Distance from nervulus to basal vein about 0.3 times nervulus length.

Parallel vein almost interstitial, weakly moving to posterior margin of wing. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.7 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unsclerotized, strongly ante-furcal.

Legs. Fore tibia with rather sparse spines arranged in one row. Hind coxa rather small (its length 1.8 times maximum width), with basoventral tooth and corner. Hind femur 3.5 times as long as wide. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.5 times as long as second-fifth segments combined; second tarsal segment 0.55 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) very weakly curved ventrally, slightly and regularly curved dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{2}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 3.5 times its apical width, 1.8 times length of propodeum; apical width 1.45 times width at level of spiracles. Second and third tergites with separate laterotergites. Second suture very fine. Median length of second and third tergites combined about twice basal width of second tergite, 1.2 times their maximum width submedially.

Sculpture and pubescence. Vertex distinctly and not strongly transversely striate, without ground sculpture between striae. Frons densely transversely striate. Face rugulose-striate, narrowly smooth medially. Temple smooth. Mesoscutum densely granulate with short and rather fine rugae near notauli; rather widely rugose and with 2 convergent striae medioposteriorly. Scutellum finely coriaceous, almost smooth partly. Mesopleura widely smooth. Metapleura densely rugose-striate. Propodeum with distinctly marginate areas, basolateral areas rugose-reticulate, with granulation basally; areola long, narrow, sparsely rugose; petiolate area short, distinctly separated from areola; basal carina long, about twice as long as fork of areola; rest of propodeum rugose-striate. Hind coxa rugose-striate dorsally, densely granulate laterally. Hind femur finely coriaceous. Petiole longitudinally striate, narrowly transversely striate in mediobasal half. Second tergite almost entirely and third in basal $\frac{3}{4}$ longitudinally striate; fourth tergite basally shortly striate, rest parts of tergites smooth. Mesoscutum with sparse white hairs along notauli and marginally. Hairs of dorsal surface of hind tibia rather sparse, semi-erect, their length 1.0–1.3 times maximum apical width of tibia.

Colour. Head brownish yellow. Mesosoma light reddish brown, propodeum dark. Metasoma reddish brown, second and third tergites brownish yellow. Antennae brownish yellow basally, darkened toward apex. Legs yellow, hind femur darkened medially. Fore wing distinctly and entirely infusate. Pterostigma brown, yellow in basal $\frac{1}{4}$.

Discussion. It is quite possible that this species is in best places in the *S. fasciatus* Walker group, in spite of the sculptured second and third tergites and the separated laterotergites of these tergites. Such characters are present in males of several Oriental species from this group. On the basis of Nixon's key this species (male!) runs to couplet 47 (page 209), when it is neces-

sary to know the ovipositor length for further progress. In one direction, this species is similar to *S. helle* Nixon (Nixon 1943: couplet 51, page 209) and their differences (except sexual structures of the second and third tergites) are the following:

- 51a. Hind tibia with less long hairs, their length on dorsal surface 1.0–1.2 times maximum width of tibia. Vertex distinctly and entirely sculptured. Radial vein arising behind middle of pterostigma. Parallel vein almost interstitial. Scutellum almost smooth *S. rufotestaceus* Motschoulsky
- Hind tibia with long hairs, their length on dorsal surface 1.5–1.7 times maximum width of tibia. Vertex almost smooth, with fine interrupted striation medially. Radial vein arising from middle of pterostigma. Parallel vein distinctly not interstitial. Scutellum distinctly granulate *S. helle* Nixon

In the other direction, *S. rufotestaceus* is similar to *S. isocrates* Nixon (Singapore) (Nixon 1943: couplet 57, page 210); the differences between these species are the following:

- 57a. Pterostigma narrow, 5.3 times as long as wide. Parallel vein almost interstitial. Nervulus perpendicular to anal vein. Median length of second and third tergites combined about twice basal width of second tergite, 1.2 times their maximum width. Mesoscutum with fine rugae near notauli. Basal carina of propodeum long, about twice as long as fork of areola. Hind coxa densely granulate laterally *S. rufotestaceus* Motschoulsky
- Pterostigma wide, 3.8 times as long as wide. Parallel vein distinctly not interstitial. Nervulus not perpendicular to anal vein. Median length of second and third tergites combined 1.2 times basal width of second tergite, 0.6 times their maximum width submedially. Mesoscutum with distinct rugae near notauli. Basal carina of propodeum very short, 0.20–0.25 times as long as fork of areola. Hind coxa finely coriaceous laterally *S. isocrates* Nixon

S. rufotestaceus is also similar to *S. javanicus* Szépligeti, because males of these species have sculptured second and third tergites; their differences are the following:

- 1. Vertex sculptured. Pterostigma narrow and brown at most part, 5.3 times as long as wide. Parallel vein almost interstitial. Sternauli long, running along entire length of lower part of mesopleura. Radial vein arising behind middle of pterostigma. Basal carina of propodeum long, about twice as long as fork of areola *S. rufotestaceus* Motschoulsky
- Vertex smooth. Pterostigma wide and entirely light brown, 3.0 times as long as wide. Parallel vein not interstitial, arising almost from middle of distal margin of brachial vein. Sternauli short, running along anterior half of lower part of mesopleura. Radial vein arising from middle of pterostigma. Basal carina of propodeum very short, 0.25 times as long as fork of areola *S. javanicus* Szépligeti

In the *S. pelides* Nixon group (with separated laterotergites on second and third tergites) this species dif-

fers from both included species (*S. pelides* Nixon and *S. lucullus* Nixon) in having the mesoscutum almost without rugae near the notauli, the petiolate area of the propodeum distinctly separated, the mesopleura for the most part smooth, and the second and third tergites sculptured.

Distribution. Sri Lanka.

Spathius spasskensis Belokobylskij, 1998
(Figs 433–445)

Spathius spasskensis Belokobylskij, 1998: 94.

Material. Holotype: female, Russia, "Primorskii krai, Spassk[-Dal'nii], les, opushki, 2 08 1995, S. Belokobylskij" (ZISP).

Paratypes. Russia: 1 female, with label as holotype (ZISP); 1 female, "Primorskii krai, Spassk[-Dal'nii], les, poliany, 11 08 1995, S. Belokobylskij" (ZISP); 1 female, "Primorskii krai, Spassk[-Dal'nii], les, opushki, 9–11 07 1995, S. Belokobylskij" (ZISP).

Description. Female. Body length 3.3–3.7 mm; fore wing length 2.7–2.8 mm. Head not depressed, its width 1.5–1.6 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.5–1.8 times length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 1.0–1.3 times Od, 0.35–0.40 times OOL. Eye glabrous, 1.25–1.30 times as high as broad. Malar space height 0.4 times eye height and 0.8 times basal width of mandible. Face width 1.1 times eye height and almost equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.8–1.0 times distance from edge of depression to eye, 0.4–0.5 times width of face. Occipital carina shortly absent near mandible at short distance and not fused with hypostomal carina, complete dorsally. Hypostimal flange narrow. Vertex convex.

Antennae rather slender, filiform, 27-segmented. Scape 1.5 times as long as maximum width. First flagellar segment 5.0–5.5 times as long as its apical width, 1.1–1.2 times as long as second segment. Penultimate segment 3.0–3.5 times as long as wide, 0.5 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically.

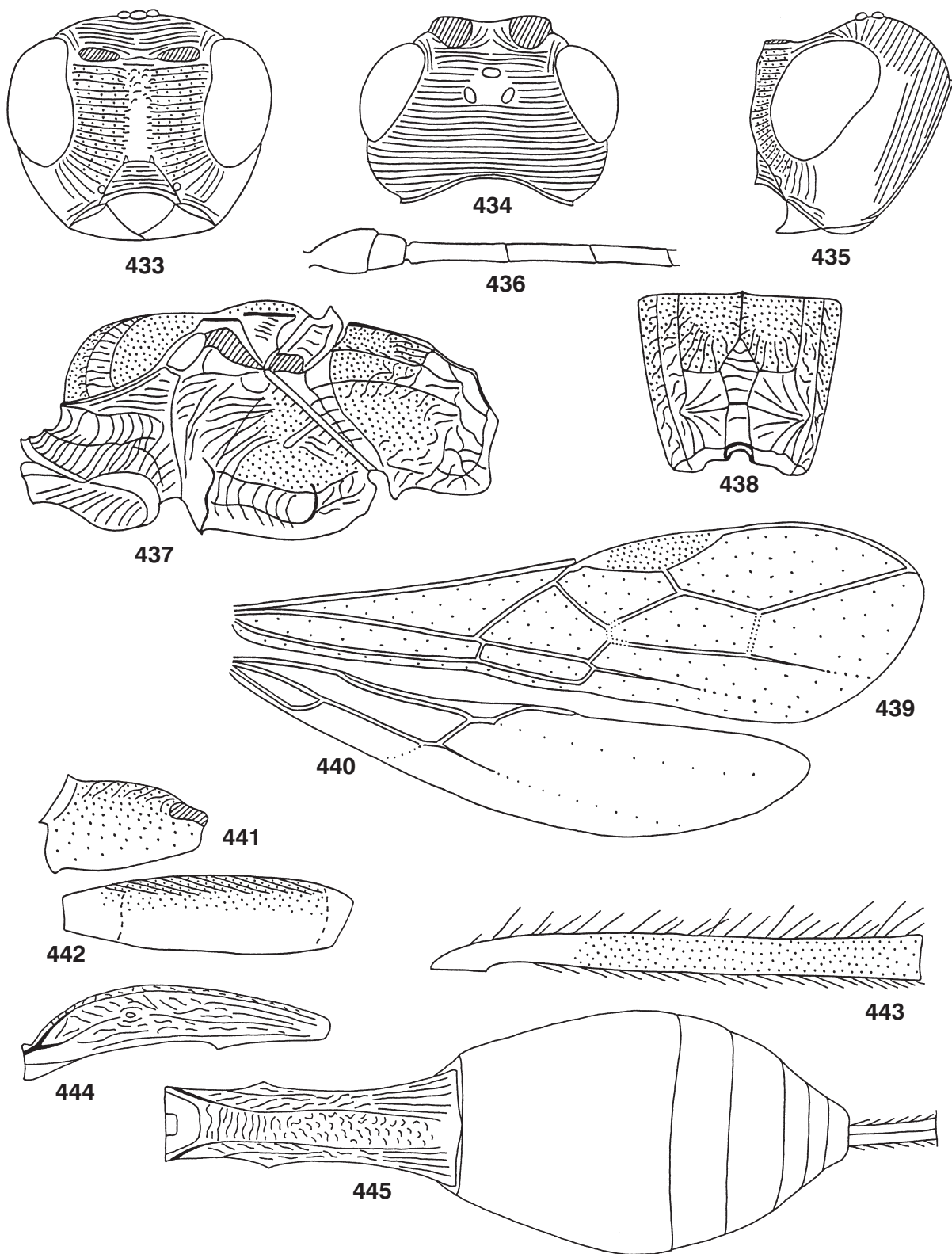
Mesosoma. Length of mesosoma 1.8–2.0 times its height. Pronotal keel distinct, its posterior branch fine, rather shortly or widely fused with posterior margin of pronotum; anterior branch distinct and situated nearly middle of pronotum. Pronotum subanteriorly with distinct and almost straight transverse carina. Pronotal lateral depression rather narrow, shallow, more or less distinctly marginate, entirely coarsely densely crenulate with fine rugulosity. Mesoscutum almost perpendicularly raised above pronotum. Notauli shallow, complete, rather wide, coarsely crenulate. Prescutellar depression deep,

wide, with 5 carinae, finely rugulose, 0.35–0.40 times as long as scutellum. Scutellum convex, without lateral carinae. Metanotum with distinct pointed tooth. Subalar depression shallow, wide, densely striate with dense granulation. Sternauli rather wide and deep in anterior half, rather narrow and shallow in posterior half, distinctly curved, coarsely crenulate and with fine granulation posteriorly, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and narrow. Propodeum with small wide pointed lateral tubercles.

Wings. Fore wing 3.3–3.7 times as long as wide. Pterostigma about 4.0 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.2–1.3 times as long as pterostigma. Second radial abscissa 3.0–3.2 times first abscissa and forming distinct angle with it, 0.45–0.50 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 2.8–3.3 times maximum width, 1.2–1.3 times length of brachial cell. Recurrent vein 3.0–3.5 times second abscissa of medial vein. Distance from nervulus to basal vein 0.10–0.25 times nervulus length. Nervulus almost perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{2}{3}$ of distal margin of brachial cell. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 5.0–5.3 times as long as wide. First costal abscissa 0.50–0.55 times second abscissa. First abscissa of mediocubital vein 0.6–0.7 times second abscissa. Recurrent vein short, unsclerotized, weakly curved, antefurcal.

Legs. Fore tibia with rather dense thick numerous spines arranged in one row. Hind coxa rather short (its length 1.5–1.6 times maximum width), with small basoventral tooth and distinct corner. Hind femur 3.5–3.8 times as long as wide. Hind tibia apically without distinct spines on outer side. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.50–0.55 times as long as basitarsus, 1.2–1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) rather weakly curved or straight ventrally, distinctly and more or less regularly curved dorsally, thickened in basal half; widened in apical $\frac{1}{3}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 2.5–2.8 times its apical width, 1.7–1.8 times length of propodeum; apical width about 1.5 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.5–1.7 times basal width of second tergite, 0.9 times their maximum width. Ovipositor straight. Ovipositor sheaths almost as long as metasoma, 2.0–2.3 times as long as petiole, 1.3–1.4 times as long as mesosoma, 0.6–0.7 times as long as fore wing.



Figures 433–445. *S. spasskensis*: (433) head, frontal view, (434) head, dorsal view, (435) head, lateral view, (436) 5 basal segments of antenna, (437) mesosoma, lateral view, (438) propodeum, (439) fore wing, (440) hind wing, (441) hind coxa, (442) hind femur, (443) hind tibia, (444) petiole, lateral view, (445) metasoma, dorsal view.

Sculpture and pubescence. Vertex with dense coarse regular transverse striation, without ground sculpture between their. Frons densely and coarsely more or less transversely striate, with fine ground sculpture. Face densely almost transversely striate with fine rugulosity between striae, with small oval smooth area medially in below half. Temple vertically densely striate medially in posterior half, smooth in anterior half. Mesoscutum densely granulate, with rather long and distinct rugae near notauli and laterally, with 2 undulate and convergent carinae medioposteriorly and with rugulosity between carinae. Scutellum entirely densely granulate. Mesopleura entirely striate-granulate, only finely granulate-coriaceous medially and sometimes with small and almost smooth median area. Propodeum with distinctly marginate areas, areola rather large or small and more or less long, pentagonal; petiolate area long and narrow, distinctly separated from areola by high carina; propodeum entirely densely rugose-granulate, with additional granulation in anterior $\frac{2}{3}$ of basolateral areas, sometimes only granulate in basal $\frac{1}{3}$ on this areas; basal carina 1.4–1.6 times as long as fork of areola. Hind coxa densely and coarsely granulate with transverse striae dorsally. Hind femur granulate-coriaceous, with long striae dorsally, almost smooth ventrally. Petiole striate, with dense and wide rugosity between striae. Rest of tergites smooth. Mesoscutum with rather sparse, rather long, semi-erect hairs along notauli and marginally. Mesopleura widely bare medially. Dorsal surface of hind tibia with rather short, quite dense and semi-erect hairs, their length 0.6–0.9 times maximum width of tibia.

Colour. Body dark reddish brown to black, head dorsally and on malar space yellowish brown. Two basal segments of antenna brownish yellow or light reddish brown, rest segments reddish brown to dark reddish brown, without pale segments in apical half. Palpi pale yellow. Legs yellowish brown to brown, fore coxae yellow, all trochanters pale yellow; middle and hind femur brown, pale basally and apically; hind tibia yellowish brown, pale yellow in basal $\frac{1}{3}$ – $\frac{1}{4}$. Ovipositor sheath yellowish brown in basal half, almost black in apical half. Fore wing rather distinctly infusate. Pterostigma dark brown, pale in basal $\frac{1}{4}$.

Discussion. This species is in the *S. fasciatus* Walker group and in Nixon's key runs to couplet 54 (page 210) and is similar to *S. japonensis* Nixon (New Guinea) and *S. tahitiensis* Nixon (Tahiti, Samoa). The differences between these species are indicated in the following key:

54. Areola of propodeum indistinct. Metasomal hairs erect. Ocelli in almost equilateral triangle. Pronotal keel very fine. Parallel vein interstitial. Mediocubital vein distinctly curved toward anal vein in distal half *S. tahitiensis* Nixon
 –. Areola of propodeum distinctly marginate. Metasomal hairs more or less semi-erect. Ocelli not in an equilateral triangle.

- Pronotal keel distinct. Parallel vein not interstitial. Mediocubital vein not or very weakly curved toward anal vein in distal half 54a
 54a. Median part of mesopleura almost smooth. Striation of vertex somewhat obsolescent. Hind tibia pale on about basal half. Sculpture on mesoscutal lobes coarse. Scutellum very finely sculptured. Basal carina of propodeum almost absent. Ovipositor sheath as long as metasoma and propodeum combined *S. japonensis* Nixon
 –. Median part of mesopleura striate-granulate. Striation of vertex coarse and complete. Hind tibia pale on basal $\frac{1}{4}$. Sculpture on mesoscutal lobes fine. Scutellum distinctly sculptured. Basal carina of propodeum long. Ovipositor sheath as long as metasoma
 *S. spasskensis* Belokobylskij

S. spasskensis Belokobylskij is also similar to *S. isocrates* Nixon (Nixon 1943: couplet 57, page 210); their differences are indicated in the following key:

- 57a. Hind coxa distinctly infusate. Hind tibia infusate at most part. Mesopleura distinctly and almost entirely sculptured. Scutellum entirely densely granulate. Basal carina of propodeum long; petiolate area separated from areola by distinct carina. Ovipositor sheath as long as metasoma *S. spasskensis* Belokobylskij
 –. Hind coxa only faintly infusate. Hind tibia very faintly infusate medially. Mesopleura smooth medially. Scutellum smooth in anterior $\frac{2}{3}$, reticulate in posterior $\frac{1}{3}$. Basal carina of propodeum very short; petiolate area hardly emphasised. Ovipositor sheath about 1.5 times as long as metasoma *S. isocrates* Nixon

Distribution. Russia (Primorskii krai).

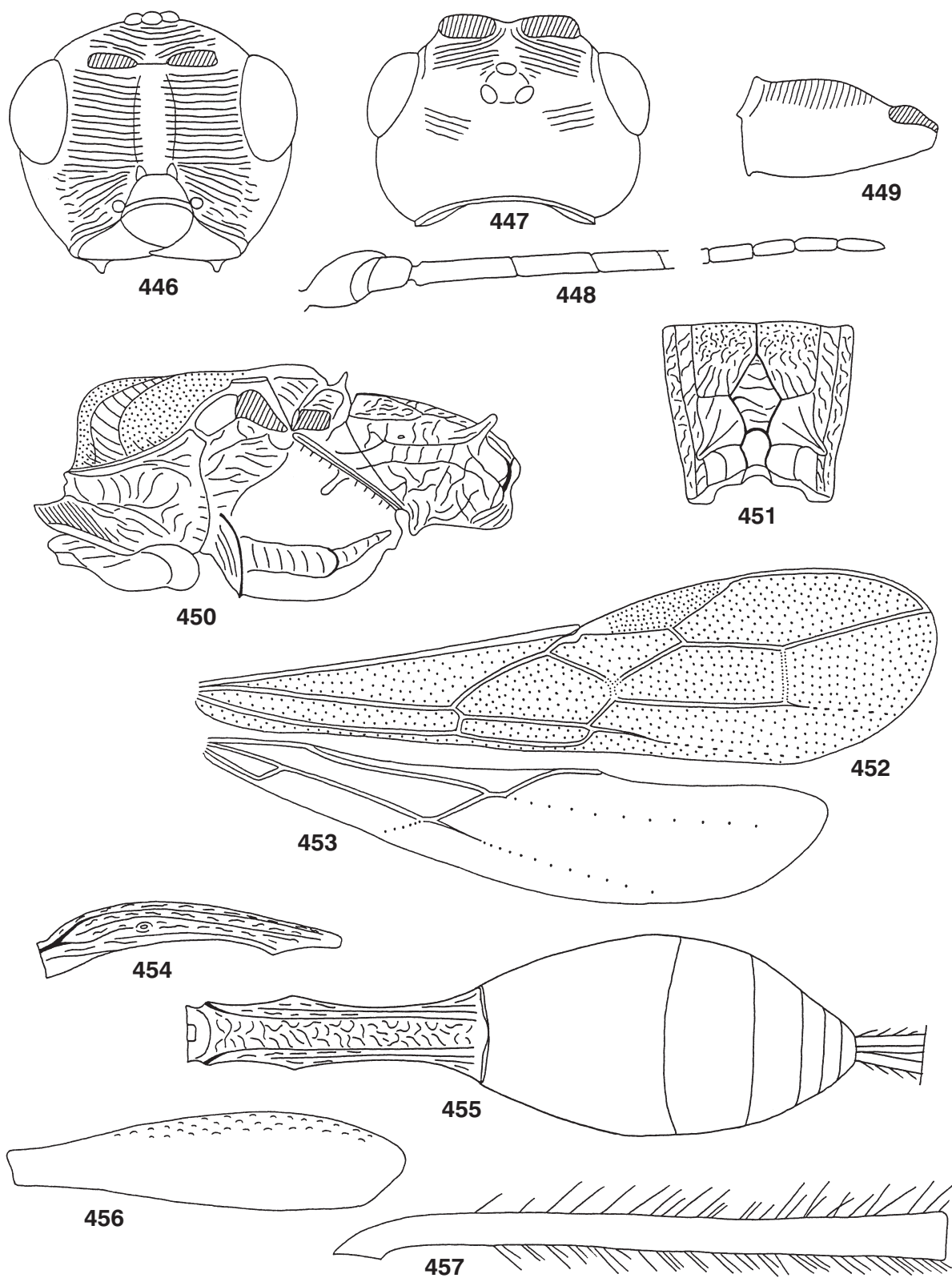
Spathius spectabilis Granger, 1949
 (Figs 446–457)

Spathius spectabilis Granger, 1949: 150; Shenefelt and Marsh 1976: 1419.

Material. Lectotype (designated here for stability of nomenclature): female, "Madagascar, Perinet, foret cote est", "Museum Paris, II-39, A. Seyrig", "34", "Type" (MNHN).

Paralectotype. 1 female, "Madagascar, Anivorano, I-30, A. Seyrig" (MNHN).

Description. Female. Body length 5.1–5.3 mm; fore wing length 3.7 mm. Head not depressed, its width 1.4 times median length. Head behind eyes weakly convex in anterior $\frac{1}{3}$, roundly narrowed in posterior $\frac{2}{3}$. Transverse diameter of eye almost equal to length of temple. Ocelli medium sized, in triangle with base 1.2–1.3 times its sides; POL 1.00–1.25 times Od, 0.3 times OOL. Eye glabrous, 1.35 times as high as broad. Malar space height 0.6–0.7 times eye height and 1.0–1.2 times basal width of mandible. Face width 1.4 times eye height and 1.1–1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.7–0.8 times distance from edge of depression to



Figures 446–457. *S. spectabilis*: (446) head, frontal view, (447) head, dorsal view, (448) basal and apical segments of antenna, (449) hind coxa, (450) mesosoma, lateral view, (451) propodeum, (452) fore wing, (453) hind wing, (454) petiole, lateral view, (455) metasoma, dorsal view, (456) hind femur, (457) hind tibia.

eye, 0.4 times width of face. Occipital carina fused with hypostomal carina, complete dorsally. Hypostomal flange wide and distinct.

Antennae filiform, 34-segmented, almost as long as body, two apical segments distinctly narrowed. Scape 1.6–1.8 times as long as wide, distinctly emarginated apically on outer side. First flagellar segment about 5.0 times as long as its apical width, 1.3 times as long as second segment. Penultimate segments 3.5 times as long as wide, 0.4 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically.

Mesosoma not depressed. Length of mesosoma almost twice its height. Pronotal keel distinct, posterior branch rather widely fused medially with posterior margin of pronotum; anterior branch situated in anterior $\frac{1}{3}$ of pronotum. Pronotum with distinct subanterior carina. Pronotal lateral depression wide, shallow, distinctly marginate, with sparse and coarse carinae. Mesoscutum highly and almost perpendicularly raised above pronotum. Median lobe of mesoscutum with rather wide complete median longitudinal depression. Notauli wide, rather deep, complete, coarsely crenulate. Prescutellar depression deep, long, smooth, with high median and fine four lateral carinae, 0.45 times as long as scutellum. Scutellum weakly convex, with complete lateral carinae. Subalar depression rather shallow, coarsely and sparsely striate. Sternauli rather deep, but shallow in posterior $\frac{1}{4}$, weakly curved, crenulate, but smooth posteriorly, running along entire length of lower part of mesopleura. Postpectal carina absent. Metanotum with long pointed tooth. Metapleural flange rather narrow and long. Propodeum with rather long, rounded apically lateral tubercles.

Wings. Fore wing 3.7–4.0 times as long as wide. Pterostigma 4.3–4.8 times as long as wide. Radial vein arising slightly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.3–1.4 times as long as pterostigma. Second radial abscissa 4.6–5.0 times first abscissa and forming obtuse angle with it, 0.7 times the straight third abscissa, 1.2–1.4 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.2–3.4 times maximum width, 1.2–1.3 times length of rather narrow brachial cell. Recurrent vein 2.5–4.0 times second abscissa of medial vein. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.1–0.3 times nervulus length. Parallel vein almost interstitial. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.2 times as long as wide. First costal abscissa 0.60–0.65 times second abscissa. First abscissa of mediocubital vein 0.5–0.6 times second abscissa. Recurrent vein unsclerotized, infuscate, interstitial, obliquely curved.

Legs. Fore tibia with dense short spines arranged in narrow stripe. Hind coxa rather small (its length almost twice maximum width), with small basoventral tooth and rather distinct corner. Hind femur almost claviform,

3.8–4.0 times as long as wide. Hind tibia apically with one spines on outer side. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.75–0.85 times as long as second-fifth segments combined; second tarsal segment 0.35 times as long as basitarsus, almost as long as thickened fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened in basal $\frac{1}{3}$; distinctly widened in basal $\frac{1}{3}$ and in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 3.0–3.2 times its apical width, twice length of propodeum; apical width 1.55–1.70 times width at level of spiracles, twice its minimum width. Second and third tergites without separate laterotergites. Second suture absent. Median length of second and third tergites combined 1.6–1.7 times basal width of second tergite, 0.80–0.85 times their maximum width. Ovipositor weakly curved up. Ovipositor sheath 1.40–1.55 times as long as metasoma, 0.8 times as long as body, 2.2–2.3 times as long as mesosoma, 1.1 times as long as fore wing.

Sculpture and pubescence. Vertex smooth, finely or rather distinctly striate in anterolateral $\frac{1}{3}$ – $\frac{1}{2}$. Frons coarsely and weakly-undulately striate. Face densely coarsely and weakly-undulately striate. Temple smooth. Mesoscutum densely and finely granulate, without any rugae along notauli and laterally, sparsely and coarsely rugose in narrow medioposterior area. Scutellum smooth. Mesopleura smooth at most part. Metapleura coarsely rugose. Propodeum densely rugose in anterior half, sparsely rugose in posterior half, rugulose-punctulate basally; with rather distinctly marginate areas; areola long and narrow, pentagonal; petiolate area short, distinctly separated from areola by high carina; basal carina 0.7–0.8 times as long as fork of areola. Hind coxa smooth or finely coriaceous, transversely striate dorsally in anterior $\frac{2}{3}$. Hind femur smooth, finely coriaceous dorsally. Petiole with complete subparallel dorsal carinae, densely rugulose in basal $\frac{1}{2}$ – $\frac{2}{3}$, sparsely striate with rugulosity in apical $\frac{1}{2}$ – $\frac{2}{3}$. Rest of tergites entirely smooth. Mesoscutum with sparse, semi-erect, rather short hairs situated along notauli and marginally. Hairs on dorsal surface of hind tibia short, rather dense, semi-erect, their length 0.6–1.0 times maximum width of tibia.

Colour. Head brownish yellow. Mesosoma and petiole reddish yellow, rest metasoma reddish brown to dark reddish brown posteriorly. Antennae yellowish brown, brown submedially, 12 apical segments yellow. Palpi yellow or brownish yellow. Legs light reddish brown, middle and hind femora dark; hind leg brown, hind tarsus paler; hind tibia without pale base. Ovipositor sheath yellow, dark brown apically. Fore wing entirely distinctly infuscate. Pterostigma brown, yellow basally and apically.

Discussion. This species is in the *S. fasciatus* Walker group. Regarding African species, *S. spectabilis*

Granger is similar to *S. rufithorax* Szépligeti (Nixon 1943: couplet 3, page 205); their differences are indicated in the following key:

- 3a. Head, mesosoma and petiole brownish or reddish yellow. Vertex striate anterolaterally. Lateral areas of pronotum distinctly marginate. Mesoscutum almost perpendicularly raised above pronotum. All propodeal areas distinctly marginate. Lateral tubercles of propodeum long. Hairs of hind tibia short *S. spectabilis* Granger
 - Head, mesosoma and petiole brown. Vertex completely smooth. Lateral areas of pronotum not marginate. Mesoscutum rather gradually raised above pronotum. Basolateral areas of propodeum weakly marginate. Lateral tubercles of propodeum absent. Hairs of hind tibia long *S. rufithorax* Szépligeti

This species is also similar to the Asian *S. naupactus* Nixon (Borneo) (Nixon 1943: couplet 8, page 205); the differences between these species are indicated below:

- 8a. Head brownish yellow; mesosoma and petiole reddish yellow, rest metasoma reddish brown to dark reddish brown posteriorly. Legs light reddish brown, middle and hind femora dark; hind leg brown. Vertex partly striate. Pronotal keel widely fused with posterior margin of pronotum. Hairs on dorsal surface of hind tibia short. Second segments of hind tarsus short, 0.35 times as long as basitarsus. Ovipositor sheath with short and recumbent hairs *S. spectabilis* Granger
 - Body unicolorous pale brownish yellow. Legs pale brownish yellow. Vertex completely smooth. Pronotal keel narrowly fused with posterior margin of pronotum. Hairs on dorsal surface of hind tibia very long. Second segments of hind tarsus longer, 0.5 times as long as basitarsus. Ovipositor sheath with long and erect hairs *S. naupactus* Nixon

Distribution. Madagascar.

Spathius sutshanicus Belokobylskij, 1998
(Figs 458–470)

Spathius sutshanicus Belokobylskij, 1998: 84.

Material. Holotype: female, Russia, “Primorskii krai, 15 km SZ Partizanska, les, 13 VII 1979, Belokobylskij” (ZISP).

Paratypes. 1 male with label as holotype (ZISP); 1 female, “Primorskii krai, 10 km YuZ Sokol’chi, Lazovskii z[apovedni]k, skaly, smesh.[annyi] les, 23.07.1993, S. Belokobylskij” (ZISP).

Description. Female. Body length 2.6–2.8 mm; fore wing length 2.3 mm. Head not depressed, its width 1.3–1.4 times median length. Head behind eyes weakly convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye 0.75–0.80 times length of temple. Ocelli small, in triangle with base 1.15 times its sides; POL 1.0–1.5 times Od, 0.3 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height

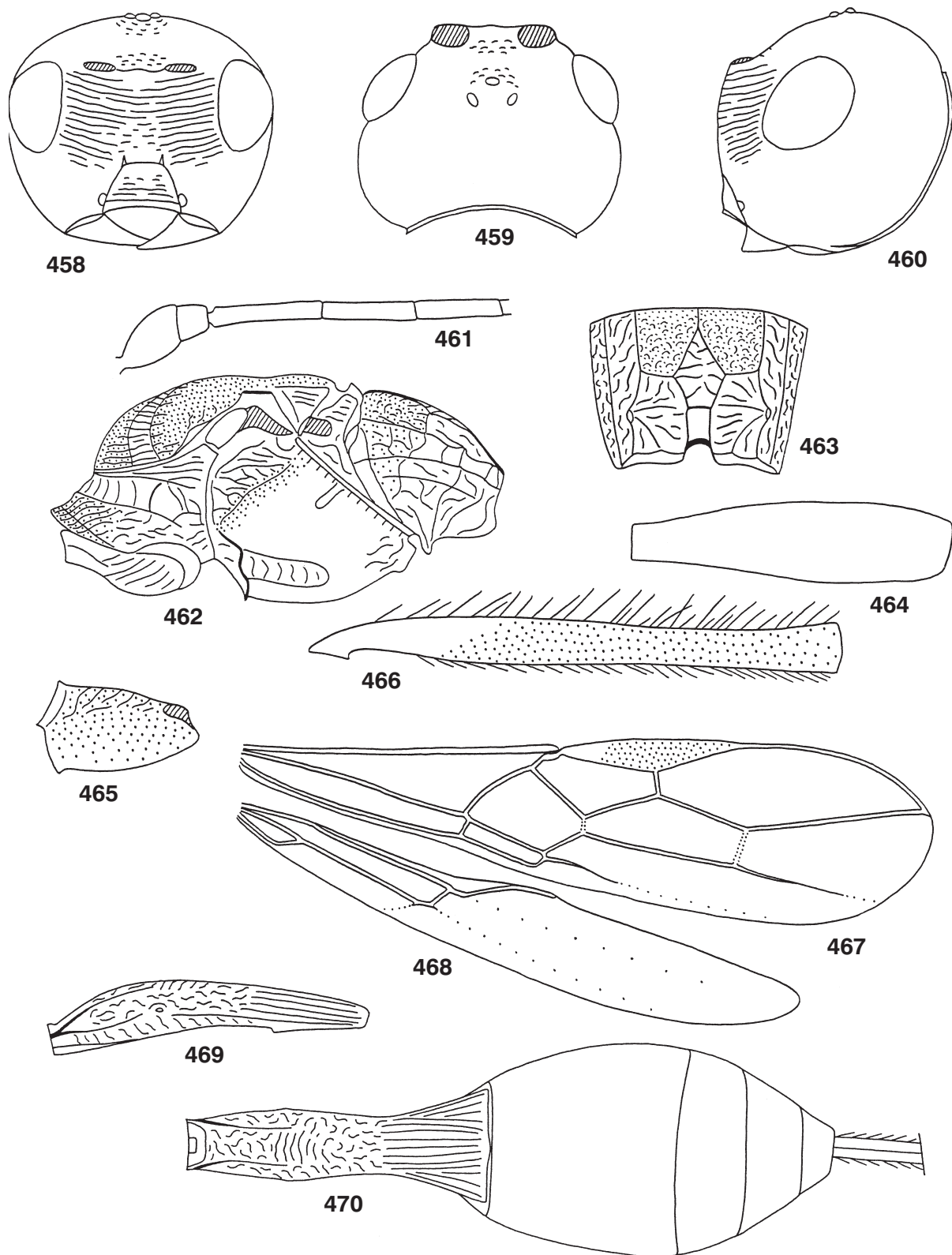
0.75–0.80 times eye height and almost equal to basal width of mandible. Face width 1.5–1.6 times eye height and almost equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression small and round, its width 0.7 times distance from edge of depression to eye, 0.35–0.40 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange very narrow. Vertex distinctly convex.

Antennae slender, filiform, more than 20-segmented (apical segments missing). Scape 1.7–1.8 times as long as wide. First flagellar segment 5.0–5.3 times as long as its apical width, 1.20–1.25 times as long as second segment. Subapical segments about 3.5 times as long as wide.

Mesosoma. Length of mesosoma about twice its height. Pronotal keel distinct, its posterior branch very shortly fused medially with posterior margin of pronotum, anterior branch fine or distinct and situated submedially. Pronotum with rather distinct subapical carina. Pronotal lateral depression wide, rather deep, almost entirely marginate, coarsely crenulate. Mesoscutum highly and gradually-roundly raised above pronotum. Notauli rather deep, wide, complete, coarsely crenulate. Prescutellar depression long, deep, with 3–5 carinae, almost smooth, 0.5 times as long as scutellum. Scutellum convex, with almost complete lateral carinae. Subalar depression shallow, wide, coarsely rugose. Sternauli deep, straight, coarsely and sparsely crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metanotum with short pointed tooth. Metapleural flange narrow and long. Propodeum without lateral tubercles.

Wings. Fore wing 3.3–3.6 times as long as wide. Pterostigma 5.3–5.5 times as long as wide. Radial vein arising shortly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.2 times as long as pterostigma. Second radial abscissa 3.0–3.5 times first abscissa and forming obtuse angle with it, 0.45–0.50 times third abscissa, 1.0–1.2 times first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 2.8–3.0 times maximum width, 1.6–1.7 times length of rather wide brachial cell. Recurrent vein 2.8–4.0 times second abscissa of medial vein. Nervulus interstitial and almost perpendicular to anal vein. Brachial cell closed shortly behind recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ – $\frac{2}{5}$ of distal margin of brachial vein. Mediocubital vein almost not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.4–0.5 times second abscissa. First abscissa of mediocubital vein 0.5–0.6 times second abscissa. Recurrent vein strongly oblique, unsclerotized, but pigmented, weakly antefurcal.

Legs. Fore tibia with numerous, rather dense, small spines arranged in narrow stripe. Hind coxa medium size (its length 1.6 times maximum width), with basoven-



Figures 458–470. *S. sutshanicus*: (458) head, frontal view, (459) head, dorsal view, (460) head, lateral view, (461) 5 basal segments of antenna, (462) mesosoma, lateral view, (463) propodeum, (464) hind femur, (465) hind coxa, (466) hind tibia, (467) fore wing, (468) hind wing, (469) petiole, lateral view, (470) metasoma, dorsal view.

tral tooth and corner. Hind femur subclavate, almost 4.0 times as long as wide. Hind tibia apically with 2–3 spines on outer margin. Hind tarsus 0.9 times as long as hind tibia. Tarsal segments slender. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.4 times as long as basitarsus, 1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, weakly and regularly curved dorsally, thickened submedially; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with more or less distinct spiracular tubercles in basal $\frac{1}{4}$. Length of petiole 2.4–2.7 times its apical width, about twice length of propodeum; apical width 1.8–2.0 times its minimum width. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.3–1.4 times basal width of second tergite, 0.8–0.9 times their maximum width. Ovipositor weakly curved up. Ovipositor sheath 1.4–1.6 times as long as metasoma, 0.7–0.8 times as long as body, 2.0–2.2 times as long as mesosoma, 0.8–0.9 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons finely or very finely striate medially. Face entirely distinctly striate. Mesoscutum densely granulate, with long and coarse rugulosity along notauli and marginally, coarsely rugose on narrow area in medio-posterior half. Scutellum finely and densely granulate. Mesopleura smooth at most part. Propodeum with marginate areas, entirely and densely granulate-rugulose; areola medium size and rather narrow; petiolate area rather narrow, distinctly separated from areola; basal carina rather short, 0.8–1.0 times as long as fork of areola. Hind coxae transversely striate dorsally, densely rugose laterally. Hind femur smooth. Petiole densely rugose-reticulate in basal $\frac{3}{4}$, distinctly striate in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with rather dense long almost erect hairs situated widely along notauli and narrowly marginally. Hairs of dorsal surface of hind tibia long, rather dense, semi-erect, their length 1.0–1.6 times maximum width of tibia.

Colour. Body light reddish brown, partly darkened dorsally. Antenna light reddish brown at most part or in basal $\frac{1}{2}$ only, faintly or distinctly darkened toward apex. Palpi yellow. Legs yellowish brown, hind legs faintly infusate; all tibiae basally pale yellow. Ovipositor sheath yellowish brown, darkened submedially and apically or apically only. Fore wing faintly infusate. Pterostigma brown, pale yellow basally.

Male. Body length 2.1 mm; fore wing length 1.7 mm. Petiole about 3.0 times as long as apical width. Mesoscutum with very weak rugulae along notauli. Otherwise similar to female.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. athesis* Nixon (Philippines) (Nixon 1943: couplet 23, page 207); their differences are indicated in the following key:

- 23a. Hind coxa infusate. Hind femur without yellow part. Temple long, distinctly longer than transverse diameter of eye. Head behind eyes strongly convex anteriorly. Pronotal keel very shortly fused medially with posterior margin of pronotum. Basal carina of propodeum longer; 0.8–1.0 times as long as fork of areola. Hind femur less distinctly claviform. Petiole longer, about twice length of propodeum *S. sutshanicus* Belokobylskij
- . Hind coxa reddish yellow to pale reddish. Hind femur with yellow part in basal $\frac{1}{4}$. Temple short, distinctly shorter than transverse diameter of eye. Head behind eyes not convex anteriorly. Pronotal keel widely fused medially with posterior margin of pronotum. Basal carina of propodeum very short. Hind femur distinctly claviform. Petiole shorter, 1.7 times length of propodeum *S. athesis* Nixon

Distribution. Russia (Primorskii krai).

Spathius testaceus Szépligeti, 1902
(Figs 471–483)

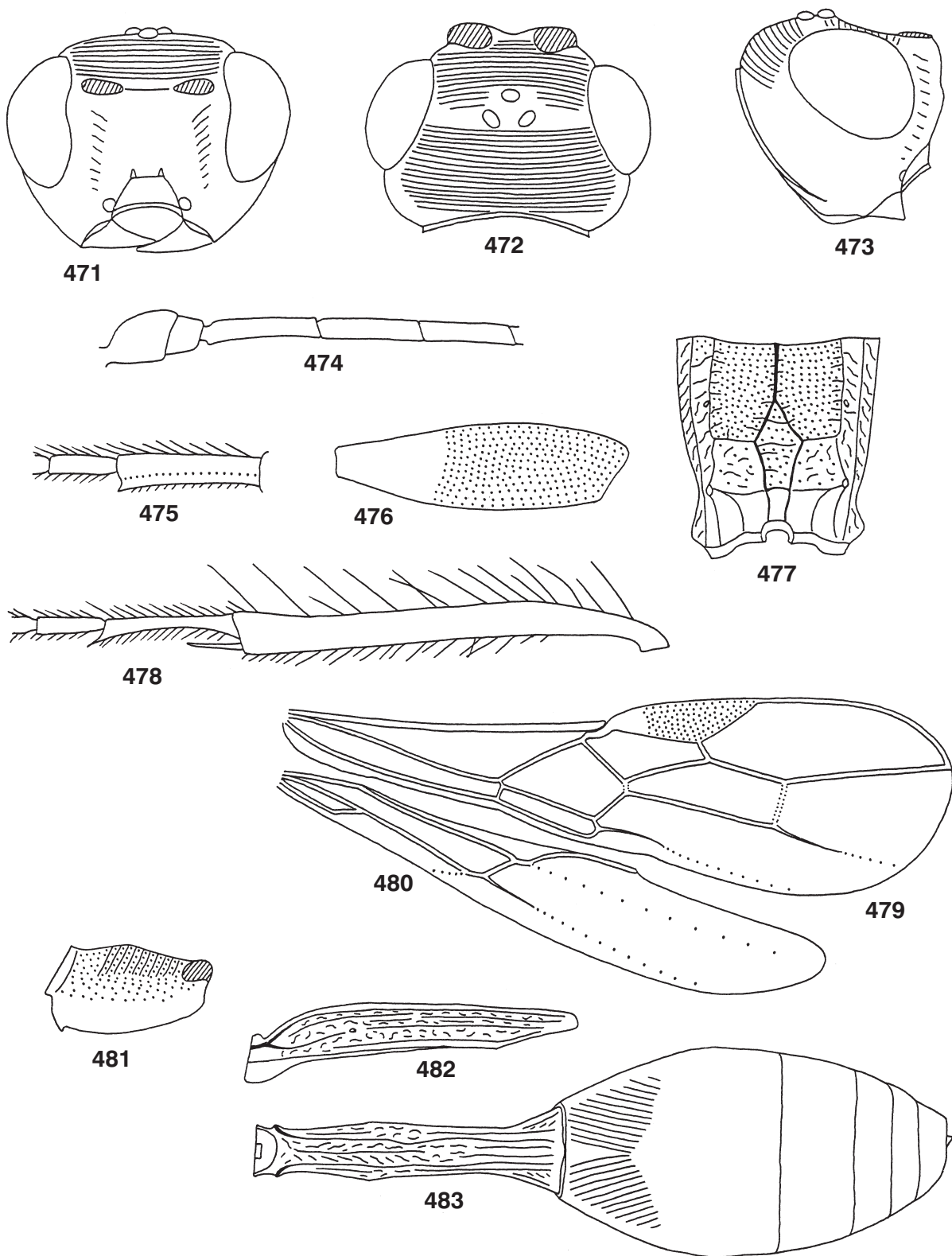
Spathius testaceus Szépligeti, 1902: 50; Nixon 1943: 446; Shenefelt and Marsh 1976: 1421.

Material. Holotype: male, “N. Guinea, Biro, 1898”, “Sattelberg, Huon-Golf”, “Holotypus ♂ *Spathius testaceus* Szepl. 1902” (below: “des. Papp J. 1969”), “Hym. Typ. No 1603, Mus. Budapest”, “*Sp. testaceus*, det. Szépligeti” (HNHM).

Description. Male. Body length 3.1 mm; fore wing length 2.3 mm. Head not depreseed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL almost equal to Od, 0.4 times OOL. Eye very shortly and sparsely setose, 1.2 times as high as broad. Malar space height 0.4 times eye height and 0.8 times basal width of mandible. Face width as long as eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.4 times width of face. Occipital carina absent near mandible and not fused with hypostomal carina at short distance, complete dorsally.

Antennae rather slender, filiform, more than 16-segmented (apical segments missing). First flagellar segment 6.0 times as long as its apical width, 1.1 times as long as second segment.

Mesosoma not depressed. Length of mesosoma 2.2 times its height. Pronotal keel distinct, posterior branch narrowly fused with posterior margin of pronotum, anterior branch situated almost on middle of pronotum. Pronotum in anterior $\frac{1}{4}$ with high transverse carine. Pronotal lateral depression rather wide, long, marginate and coarsely crenulate. Mesoscutum not highly and gradually-roundly raised above pronotum. Notauli



Figures 471–483. *S. testaceus*: (471) head, frontal view, (472) head, dorsal view, (473) head, lateral view, (474) 5 basal segments of antenna, (475) 2 basal segments of hind tarsus, dorsal view, (476) hind femur, (477) propodeum, (478) hind tibia and 2 basal segments of hind tarsus, lateral view, (479) fore wing, (480) hind wing, (481) hind coxa, (482) petiole, lateral view, (483) metasoma, dorsal view.

rather deep, rather wide, crenulate. Prescutellar depression deep, with median high carina, almost smooth, 0.45 times as long as scutellum. Scutellum weakly convex. Subalar depression shallow and rugose. Sternauli rather deep in anterior half, shallow in posterior half, weakly curved, rather wide, but narrow posteriorly, sparsely crenulate, running along entire length of lower part of mesopleura. Metanotum with short pointed tooth. Metapleural flange rather long and narrow. Propodeum with distinct, but short lateral tooth.

Wings. Fore wing 3.5 times as long as wide. Pterostigma 3.5 times as long as wide. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.8 times first abscissa and forming very obtuse angle with it, 0.5 times third abscissa, equal to first radiomedial vein. Second radiomedial cell weakly narrowed distally, its length 3.3 times maximum width, 1.5 times length of narrow brachial cell. Recurrent vein almost 5.0 times second abscissa of medial vein. Nervulus distinctly oblique towards base of wing. Distance from nervulus to basal vein 0.3 times nervulus length. Parallel vein not interstitial, arising near middle of brachial vein. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 6.0 times as long as wide. First costal abscissa 0.55 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein unscerotized, distinctly antifurcal.

Legs. Fore tibia with rather dense small spines arranged in one row. Hind coxa medium size (its length 1.7 times maximum width), with small, but distinct basoventral tooth and distinct corner. Hind femur 3.2 times as long as wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus compressed, with wide ventral longitudinal keel and pointed process apically, 0.6 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, 0.8 times as long as fifth segment (without pretarsus). Other tarsal segments normal shape.

Metasoma. Petiole (lateral view) straight ventrally, weakly and regularly curved dorsally, weakly thickened in basal third; distinctly widened in apical $\frac{1}{3}$ (dorsal view), with spiracular tubercles in basal third. Length of petiole 3.8 times its apical width, almost twice length of propodeum; apical width 1.4 times width at level of spiracles. Second tergite with separate laterotergites. Second suture indistinct. Median length of second and third tergites combined almost twice basal width of second tergite, equal to their maximum width.

Sculpture and pubescence. Vertex finely transversely striate, without ground sculpture. Frons distinctly densely transversely striate. Face widely smooth, finely rugulose-striate sublaterally. Temple smooth. Mesoscutum densely granulate with rather short but distinct rugosity along notauli and laterally. Scutellum very finely granu-

late. Mesopleura smooth, striate upper. Metapleura coarsely rugose-striate. Propodeum with distinctly marginate areas; basolateral areas long, granulate, with rather long rugae along carinae; areola rather short and narrow, finely coriaceous, with several rugae; petiolate area distinctly separated, rather short and narrow; present high transverse carina connecting lateral tubercles; rest of propodeum finely coriaceous; basal carina long, almost as long as fork of areola. Hind coxae dorsally granulate with fine striation partly, finely granulate laterally, almost smooth ventrally. Hind femur finely coriaceous, with fine striation dorsally. Petiole striate, with rugulosity between striae, widely rugulose between dorsal carinae. Second tergite finely or very finely rugulose-striate in basal $\frac{2}{3}$. Rest of tergites smooth. Mesoscutum with sparse semi-erect white long hairs along notauli and marginally. Hairs of dorsal surface of hind tibia long, semi-erect, rather dense, their length 1.2–1.8 times maximum width of tibia.

Colour. Head yellow. Mesosoma and metasoma reddish yellow. Antennae yellow, faintly darkened toward apex. Palpi pale yellow. Legs yellow, all femora brownish in apical $\frac{3}{4}$ – $\frac{5}{6}$, hind tibia whitish at long submedian distance. Fore wing faintly infusate, with narrow pale strip under base of pterostigma. Pterostigma dark brown, yellow in basal $\frac{1}{3}$.

Discussion. *S. testaceus* Szépligeti is in the *S. fasciatus* Walker group, in spite of the partly sculptured second tergite in the male. This species distinctly differs from all species of this group by the compressed hind basitarsus with a distinct keel on the lower side and a pointed process on the inner apical margin. *S. testaceus* is more closely similar to *S. helle* Nixon (Nixon 1943: couplet 51, page 209); their differences are indicated in the following key:

- 51a. Face narrow. Mesoscutum weakly and gradually raised above pronotum. Radial vein arising behind middle of pterostigma. Nervulus postfurcal. Petiole longer, about twice as long as propodeum. Hind basitarsus compressed and with ventral keel. Mesoscutum with distinct striae along notauli *S. testaceus* Szépligeti
 —. Face wider. Mesoscutum more highly and almost perpendicularly raised above pronotum. Radial vein arising from middle of pterostigma. Nervulus almost interstitial. Petiole shorter, about 1.5 times as long as propodeum. Hind basitarsus not compressed and without ventral keel. Mesoscutum without striae along notauli *S. helle* Nixon

Distribution. New Guinea.

Spathius tutuilensis Fullaway, 1940
 (Figs 484–496)

Spathius tutuilensis Fullaway, 1940: 404; Nixon 1943: 447; Shenefelt and Marsh 1976: 1422.

Material. Holotype: female, "Amouli, II-30", "Tutuila, Samoa", "D.T. Fullaway Collector", "Type *Spathius tutuilensis*", "Holotype No 1691 BPBM, *Spathius tutuilensis* Fullaway" (BPBM).

Description. Female. Body length 3.8 mm; fore wing length 2.7 mm. Head not depressed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye twice length of temple. Ocelli medium sized, almost in equilateral triangle; POL 1.2 times Od, 0.5 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.35 times eye height and 0.8 times basal width of mandible. Face width equal to eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression almost round, its width 0.9 times distance from edge of depression to eye. Occipital carina shortly absent near mandible and not fused with hypostomal carina, dorsally complete.

Antennae rather slender, filiform, more than 17 segmented (lateral segments missing) (34-segmented from description). Scape 1.7 times as long as wide. First flagellar segment 5.7 times as long as its apical width, 1.2 times as long as second segment. Submedian segment 3.0–3.3 times as long as wide.

Mesosoma. Length of mesosoma twice its height. Pronotal keel rather fine, its posterior branch widely fused with posterior margin of pronotum, anterior branch situated near middle of pronotum. Pronotal lateral depression wide, distinctly marginate, sparsely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, but shallow in posterior $\frac{1}{2}$, wide, crenulate. Prescutellar depression long, deep, with median carina, finely rugulose, 0.4 times as long as scutellum. Scutellum weakly convex. Sternauli deep, rather wide, curved, coarsely crenulate, running along entire length of lower part of mesopleura. Subalar depression shallow, wide, striate, sparsely striate in below $\frac{2}{3}$. Metanotum with short and pointed tooth. Metapleural flange long and rather narrow. Propodeum with small lateral tubercles.

Wings. Fore wing 3.5 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.35 times as long as pterostigma. Second radial abscissa 4.0 times first abscissa and forming strongly obtuse angle with it, 0.6 times straight third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.0 times maximum width, 1.5 times length of brachial cell. Recurrent vein about 2.5 times second abscissa of medial vein. Nervulus distinctly oblique towards base of wing. Distance from nervulus to basal vein 0.3 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.55 times second abscissa. Recurrent vein interstitial.

Legs. Hind coxa medium size (its length 1.7 times maximum width), with distinct basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tibia apically with 2 slender spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.55 times as long as second-fifth segments combined; second tarsal segment 0.6 times as long as basitarsus, 1.1 times as long as fifth segment (without pretarsus).

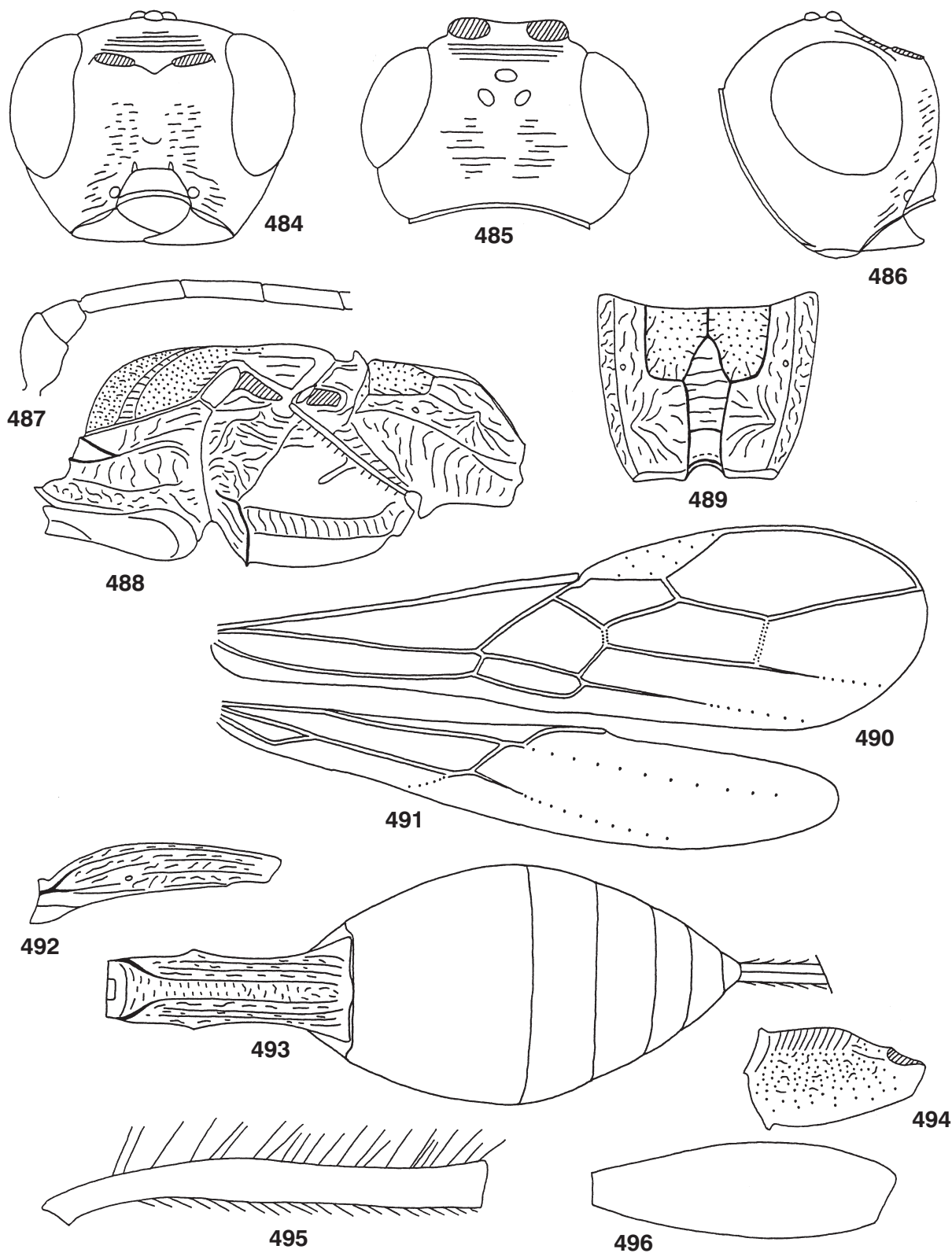
Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, distinctly thickened in basal half; distinctly widened in apical $\frac{1}{5}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.4 times its apical width, 1.6 times length of propodeum; apical width 1.3 times width at level of spiracles. Second and third tergites without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.4 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.65 times as long as metasoma, 1.7 times as long as petiole, 0.9 times as long as mesosoma, 0.5 times as long as fore wing.

Sculpture and pubescence. Vertex finely and incompletely striate, smooth in posterior $\frac{1}{5}$. Frons finely striate. Face finely rugulose-striate medially, smooth laterally. Temple smooth. Mesoscutum on lateral lobes rather finely granulate, distinctly rugulose with granulation on median lobe, with two short striae and rugulosity around its in rather small medioposterior area. Scutellum almost smooth. Mesopleura smooth. Metapleura coarsely rugose-striate. Propodeum coarsely and sparsely rugose, areas distinctly marginate, basoventral areas finely punctulate at most part, areola long and rather narrow, petiolate area not separated; basal carina 0.7 times as long as fork of areola. Hind coxae densely semi-concentric striae dorsally, rugulose-punctulate laterally. Hind femur almost entirely smooth. Petiole entirely striate-rugulose. Rest of tergites smooth. Mesoscutum with sparse, long, semi-erect hairs along notauli and laterally. Hairs on dorsal surface of hind tibia long, rather dense, semi-erect, their length 1.1–1.3 times maximum width of tibia.

Colour. Mesosoma light reddish brown, head dorsally darker. Antennal segments entirely pale yellow. Palpi pale yellow. Legs entirely pale yellow, hind coxa very slightly darker. Ovipositor sheath light brown. Fore wing hyaline. Pterostigma pale yellow.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. lynceus* Nixon and *S. gades* Nixon (Nixon 1943: couplet 41, page 209); their differences are indicated in the following key:

- 41a. Antennae entirely pale yellow. All femora and hind coxa yellow. Pterostigma yellow. Vertex finely striate in anterior $\frac{2}{3}$, smooth in posterior $\frac{1}{3}$. Lateral lobes of mesoscutum without striae. Fore wings hyaline
 *S. tutuilensis* Fullaway



Figures 484–496. *S. tutuilensis*: (484) head, frontal view, (485) head, dorsal view, (486) head, lateral view, (487) 5 basal segments of antenna, (488) mesosoma, lateral view, (489) propodeum, (490) fore wing, (491) hind wing, (492) petiole, lateral view, (493) metasoma, dorsal view, (494) hind coxa, (495) hind tibia, (496) hind femur.

- . Antennae brown, paler in base and with pale yellow several apical segments. All femora and hind coxa reddish. Pterostigma brown, yellowish in basal $\frac{1}{2}$. Vertex entirely coarsely striate. Lateral lobes of mesoscutum with striae. Fore wings infusate
 *S. lynceus* Nixon and *S. gades* Nixon

In the subgroup of species with the vertex entirely smooth, *S. tutuilensis* Fullaway is similar to *S. fasciatus* Walker and *S. moscus* Nixon (Nixon 1943: couplet 24a, page 207) and differs in the same characters as was indicated above and additionally in the short ovipositor sheaths.

Distribution. Samoa.

Spathius vladimiri Belokobylskij, 1998
 (Figs 497–509)

Spathius vladimiri Belokobylskij, 1998: 95.

Material. Holotype: female, Japan, Kyushu, "(Fukuoka), Nogochi, Fukuoka-shi, 28.VIII.1992, V. Makarkin"(FAHU).

Description. Female. Body length 4.0 mm; fore wing length 2.7 mm. Head not depressed, its width 1.5 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye almost twice length of temple. Ocelli medium sized, in triangle with base 1.2 times its sides; POL 1.25 times Od, 0.5 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and 0.9 times basal width of mandible. Face width 1.1 times eye height and equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression almost round, its width 1.2 times distance from edge of depression to eye, 0.5 times width of face. Occipital carina fused with hypostomal carina near mandible, complete dorsally. Hypostomal flange rather wide. Vertex convex.

Antennae slender, filiform, 34-segmented, 1.4 times as long as body. Scape almost 1.5 times as long as wide. First flagellar segment 4.5 times as long as its apical width, 1.25 times as long as second segment. Penultimate segment 3.0 times as long as wide, 0.45 times as long as first segment, 0.9 times as long as apical segment; the latter obtuse apically.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel distinct, its posterior branch narrowly fused medially with posterior margin of pronotum, anterior branch situated submedially. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression distinctly marginate, rather narrow, shallow, strongly and densely crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli deep, wide, complete, coarsely crenulate. Prescutellar depression deep, long, with distinct median and two fine lateral carinae, sparsely and finely rugulose, 0.3 times as long as scutellum. Scutellum weakly convex and with distinct

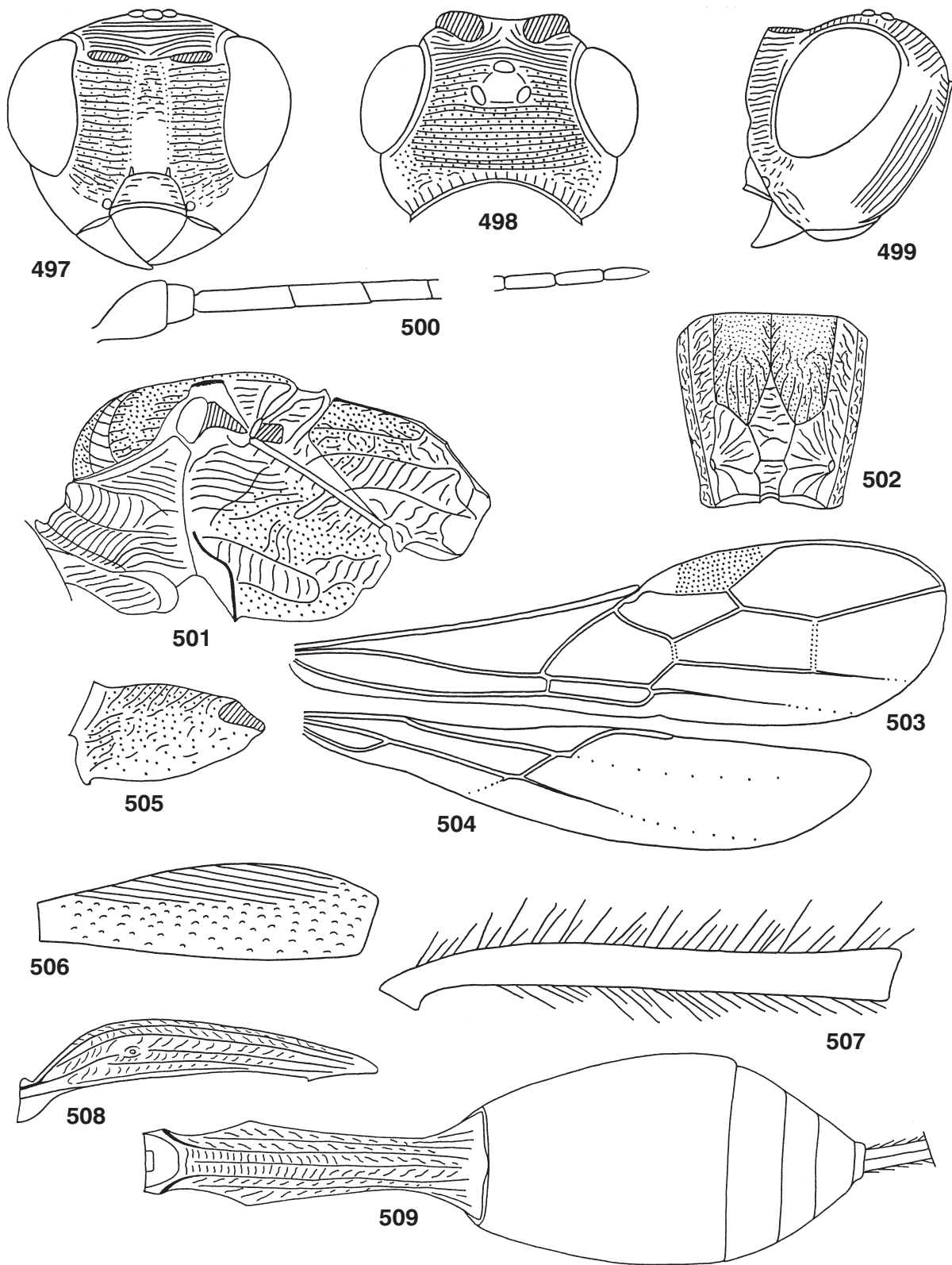
and complete lateral carinae. Metanotum with very short dorsal tooth. Subalar depression shallow, wide, coarsely striate-rugose. Sternauli deep and wide in anterior $\frac{2}{3}$, shallow and narrow in posterior $\frac{1}{3}$, weakly S-shaped, coarsely crenulate, running along entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and rather narrow. Propodeum with small and thick lateral tubercles.

Wings. Fore wing 3.4 times as long as wide. Pterostigma 3.5 times as long as maximum width. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened, metacarpus 1.3 times as long as pterostigma. Second radial abscissa 3.7 times first abscissa and forming obtuse angle with it, 0.5 times the straight third abscissa, almost equal to first radio-medial vein. Second radiomedial cell not narrowed distally, its length 3.0 times maximum width, 1.5 times length of brachial cell. Recurrent vein almost 3.0 times second abscissa of medial vein. Distance from nervulus to basal vein 0.2 times nervulus length. Nervulus oblique toward base of wing. Brachial cell closed weakly behind recurrent vein. Parallel vein almost interstitial. Mediocubital vein weakly curved to anal vein. Hind wing 5.0 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein long, pigmented, curved, antefurcal.

Legs. Fore tibia with rather dense slender numerous spines arranged in narrow stripe. Hind coxa rather long (its length 1.7 times maximum width), with small basoventral tooth and distinct corner. Hind femur elongate-oval, 3.3 times as long as wide. Hind tibia apically without spines. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, dorsally distinctly curved in basal half and almost straight in apical half, strongly thickened in basal $\frac{1}{2}$; distinctly widened in apical $\frac{1}{2}$ (dorsal view), with distinct spiracular tubercles in basal $\frac{1}{2}$. Length of petiole 3.0 times its apical width, 1.8 times length of propodeum; apical width 1.4 times width at level of spiracles. Second tergite without separate laterotergites. Second suture absent. Median length of second and third tergites combined twice basal width of second tergite, 1.15 times their maximum width. Ovipositor weakly curved down. Ovipositor sheath 0.7 times as long as metasoma, 1.6 times as long as petiole, almost as long as mesosoma, 0.6 times as long as fore wing.

Sculpture and pubescence. Vertex and frons weakly undulately transversely coarsely striate, with ground intermediate sculpture, vertex posteriorly near occipital carina usually rugulose and with short longitudinal striae. Face rugose-striate. Temple smooth in anterior half,



Figures 497–509. *S. vladimiri*: (497) head, frontal view, (498) head, dorsal view, (499) head, lateral view, (500) basal and apical segments of antenna, (501) mesosoma, lateral view, (502) propodeum, (503) fore wing, (504) hind wing, (505) hind coxa, (506) hind femur, (507) hind tibia, (508) petiole, lateral view, (509) metasoma, dorsal view.

rugulose-striate in posterior $\frac{1}{3}$ – $\frac{1}{2}$; malar space almost smooth. Mesoscutum coarsely rugose-striate at most part, with dense granulation between rugae, lateral lobes densely granulate only in narrow median longitudinal area; mesoscutum with 2 convergent and undulate striae in posterior half and coarse rugosity around its. Scutellum densely granulate, with fine rugae. Mesopleura coarsely rugose-striate with granulation partly, smooth only at small area medio posteriorly. Propodeum coarsely and sparsely rugose, densely rugulose-granulate in basolateral areas, areas distinctly marginate, areola long and narrow, petiolate area long and distinctly separated from areola; basal carina almost as long as fork of areola. Hind coxa densely rugulose-granulate, transversely striate dorsally. Hind femur striate dorsally, finely coriaceous on rest part. Petiole striate and with dense rugosity between it, shortly smooth apically. Rest of tergites smooth. Mesoscutum with long and rather dense erect hairs along notauli and marginally. Mesopleura widely bare. Hairs of dorsal surface of hind tibia almost erect, dense and long, their length 0.9–1.2 times maximum width of tibia.

Colour. Head reddish brown, with paler frons, malar spaces and narrow ring around eyes. Mesosoma and petiole almost black, mesonotum more or less widely reddish brown. Other metasomal tergites dark reddish brown or reddish brown, light ventrally and apically. Antennae light reddish brown in basal $\frac{1}{4}$, then dark reddish brown, 13 subapical segments in apical $\frac{1}{3}$ yellow, 1–2 apical segments dark. Palpi pale yellow. Legs light brown, paler basally, hind coxae light reddish brown, hind femur dark brown in subapical $\frac{1}{3}$, hind tibia faintly paler basally. Ovipositor sheath reddish brown or light brown, almost black apically. Fore wing faintly infuscate. Pterostigma brown, yellow in basal $\frac{1}{3}$.

Discussion. This species is in the *S. fasciatus* Walker group and is similar to *S. asclepiades* Nixon (Nixon 1943: couplet 51, page 209); their differences are indicated in the following key:

- 51a. Vertex coarsely striate. Mesoscutum strongly raised above pronotum and coarsely rugose at most part. Basal carina of propodeum long, as long as fork of areola. Hind tibia without apical spines. Parallel vein of fore wing almost interstitial. Petiole long, 1.8 times as long as propodeum *S. vladimiri* Belokobylskij
- . Vertex finely obsolescently striate. Mesoscutum not strongly raised above pronotum and almost without rugosity. Basal carina of propodeum very short, 0.20–0.25 times as long as fork of areola. Hind tibia with 1–2 apical spines on outer side. Parallel vein of fore wing not interstitial. Petiole short, 1.3 times as long as propodeum *S. asclepiades* Nixon

S. vladimiri Belokobylskij is also similar to *S. aphareus* Nixon (Nixon 1943: couplet 46, page 209); their differences are indicated in the following key:

- 46a. Head behind eyes less strongly narrowed. Vertex without longitudinal striae. Temple longer. Mesoscutum distinctly rugose. Mesopleura sculptured almost entirely. Propodeum coarsely sculptured and with distinctly marginate areas. Parallel vein almost interstitial *S. vladimiri* Belokobylskij
- . Head behind eyes strongly narrowed. Vertex with distinct longitudinal striae laterally. Temple shorter. Mesoscutum finely rugose. Mesopleura smooth at median part. Propodeum finely sculptured and with finely marginate areas. Parallel vein not interstitial ... *S. aphareus* Nixon

Distribution. Japan (Kyushu).

Spathius xanthocephalus Chao, 1977
(Figs 510–522)

Spathius xanthocephalus Chao, 1977: 212.

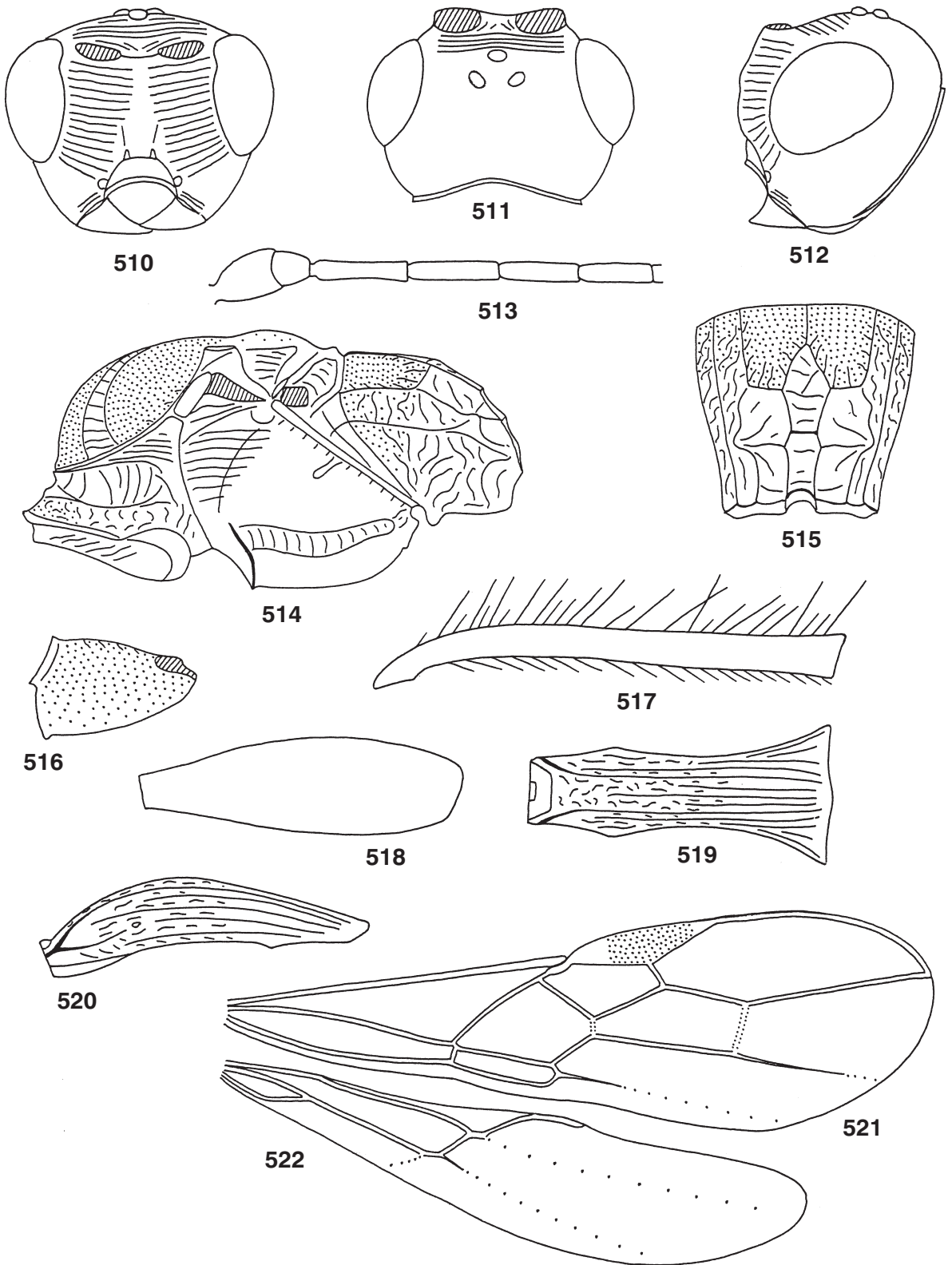
Material. Paratype: female, China, “7 hieroglyphs, 1965.VII.21, 4 hieroglyphs”, “Paratype”, “*Spathius xanthocephalus* Chao, 5 hieroglyphs”, “36” (IZBC).

Description. Female. Body length 3.4 mm; fore wing length 3.0 mm. Head not depressed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.7 times length of temple. Ocelli small, in triangle with base 1.25 times its sides; POL 1.3 times Od, 0.35 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.5 times eye height and 1.2 times basal width of mandible. Face width 1.2 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression almost round, its width 0.8 times distance from edge of depression to eye. Occipital carina absent at short distance near mandible and not fused with hypostomal carina, complete dorsally. Vertex convex.

Antennae slender, filiform, more than 16-segmented (apical segments missing). First flagellar segment 5.2 times as long as its apical width, 1.1 times as long as second segment.

Mesosoma. Length of mesosoma 1.85 times its height. Pronotal keel distinct, its posterior branch fused medially with posterior margin of pronotum, anterior branch situated submedially. Mesoscutum highly and roundly raised above pronotum. Notauli deep, complete, crenulate. Prescutellar depression deep, with 5 distinct carinae, smooth, about 0.5 times as long as scutellum. Scutellum weakly convex. Metanotum without distinct dorsal tooth. Sternauli deep and rather narrow, weakly curved, crenulate, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and rather wide. Propodeum with small lateral tubercles.

Wings. Fore wing 3.3 times as long as wide. Pterostigma about 4.0 times as long as maximum width. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened, metacarpus 1.4 times as long as pterostigma. Second radial abscissa 3.2 times first



Figures 510–522. *S. xanthocephalus*: (510) head, frontal view, (511) head, dorsal view, (512) head, lateral view, (513) 6 basal segments of antenna, (514) mesosoma, lateral view, (515) propodeum, (516) hind coxa, (517) hind tibia, (518) hind femur, (519) petiole, dorsal view, (520) petiole, lateral view, (521) fore wing, (522) hind wing.

abscissa and forming distinct obtuse angle with it, 0.45 times the straight third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 2.5 times maximum width, 1.4 times length of brachial cell. Recurrent vein almost 3.0 times second abscissa of medial vein. Distance from nervulus to basal vein 0.2 times nervulus length. Nervulus perpendicular to anal vein. Brachial cell closed weakly behind recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein weakly curved to anal vein. Hind wing about 5.0 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein short, unpigmented, weakly curved, distinctly antefurcal.

Legs. Fore tibia with slender numerous spines arranged almost in one row. Hind coxa with basoventral tooth and corner. Hind femur elongate-oval, 3.3 times as long as wide. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly curved dorsally, strongly thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with distinct spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.2 times its apical width, 1.5 times length of propodeum. Second tergite without separate laterotergites. Second suture absent. Median length of second and third tergites combined 1.7 times basal width of second tergite, 0.9 times their maximum width. Ovipositor almost straight. Ovipositor sheath 1.3 times as long as petiole, 0.55 times as long as metasoma 0.85 times as long as hind tibia, 0.33 times as long as fore wing.

Sculpture and pubescence. Vertex and temple smooth. Frons almost entirely with fine striation. Face at most part striate with fine rugulosity. Mesoscutum densely granulate, without rugae along notauli and laterally, with 2 almost straight striae in medioposterior part. Scutellum almost smooth. Mesopleura very finely sculptured at most part. Propodeum coarsely and sparsely rugose, finely granulate anteriorly in basolateral areas; areas distinctly marginate, areola rather long and narrow, petiolate area rather short and separated from areola, basal carina 0.8 times as long as fork of areola. Hind coxa densely granulate. Hind femur smooth. Petiole sparsely longitudinally striate with rugulosity in basal $\frac{3}{4}$, densely striate in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with long and sparse semi-erect hairs along notauli and marginally. Mesopleura widely glabrous. Hairs of dorsal surface of hind tibia almost erect, rather dense and long, their length 1.3–1.5 times maximum width of tibia.

Colour. Body dark reddish brown or black partly, head completely and metasoma ventrally yellowish

brown. Antennae light reddish brown basally, infusate toward apex. Palpi pale yellow. Legs yellowish brown, hind femur darkened medially. Ovipositor sheath dark brown, light brown basally. Fore wing faintly infusate. Pterostigma brown, pale yellow in basal $\frac{1}{3}$ and distally.

Discussion. Study and comparison of the paratype of *S. xanthocephalus* Chao, 1977 and the paratype of *S. helle* Nixon, 1943 [female, "Los Banos, P.I., 16-III-1923, A Rowan", "Acc. No Ec.- 27, Coll of Agr. Univ., P.I.", "*Spathius helle* Nixon, Paratype" (BMNH)] distinctly showed that *S. xanthocephalus* is a junior synonym of *S. helle* (**syn. nov.**)

Spathius yunnanensis Chao, 1977
(Figs 523–535)

Spathius yunnanensis Chao, 1977: 215.

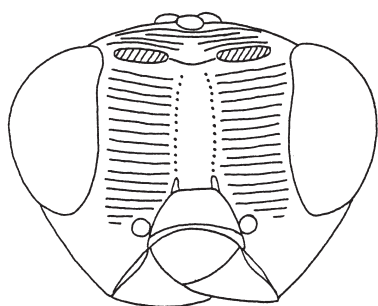
Material. Paratype: female, China, "8 hieroglyphs, 1200–1400, 2 hieroglyphs, 5 hieroglyphs", "1958.V.17, 3 hieroglyphs: 3 hieroglyphs", "Paratype", "*Spathius yunnanensis* Chao, 5 hieroglyphs", "38" (IZBC).

Description. Female. Body length 4.2 mm; fore wing length 3.4 mm. Head not depressed, its width 1.7 times median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 2.2 times length of temple. Ocelli medium sized, in almost equilateral triangle; POL 0.9 times Od, 0.35 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.4 times eye height and almost equal to basal width of mandible. Face width equal to eye height and almost equal to height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.5 times width of face. Occipital carina complete and fused with hypostomal carina near mandible, complete dorsally. Hypostomal flange rather narrow. Vertex convex.

Antennae missing, only scape and pedicel present.

Mesosoma. Length almost twice its height. Pronotal keel more or less distinct, posterior branch fused with posterior margin of pronotum; anterior branch situated nearly middle of pronotum. Mesoscutum distinctly and roundly raised above pronotum. Notauli rather shallow, complete, crenulate. Prescutellar depression rather deep and wide, with 5 carinae, rugulose, 0.35 times as long as scutellum. Scutellum weakly convex. Metanotum with short wide pointed tooth. Subalar depression shallow, wide, rugose-striate. Sternauli wide and deep in anterior 0.6, shallow and narrow in posterior $\frac{2}{5}$, distinctly curved, sparsely crenulate, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and rather wide. Propodeum without lateral tubercles.

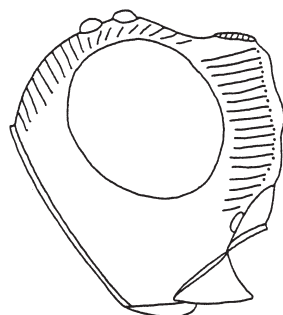
Wings. Fore wing 3.7 times as long as wide. Pterostigma rather narrow. Radial vein arising distinctly behind middle of pterostigma. Radial cell not shortened;



523



524



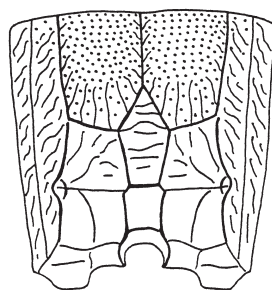
525



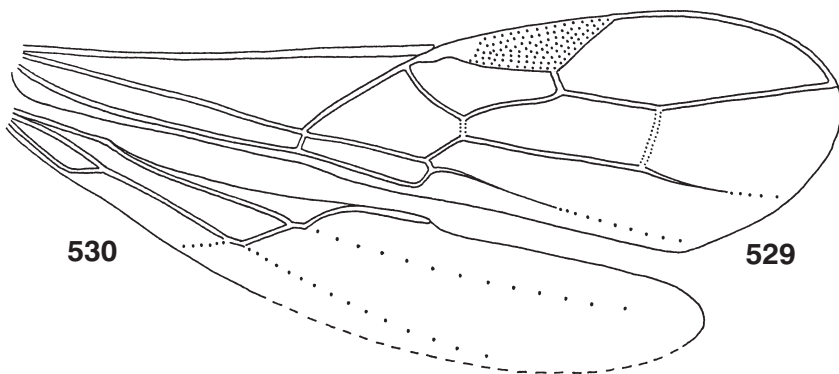
526



527

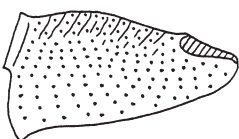


528

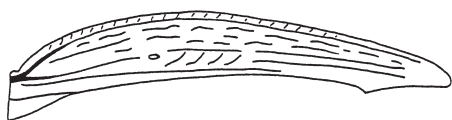


529

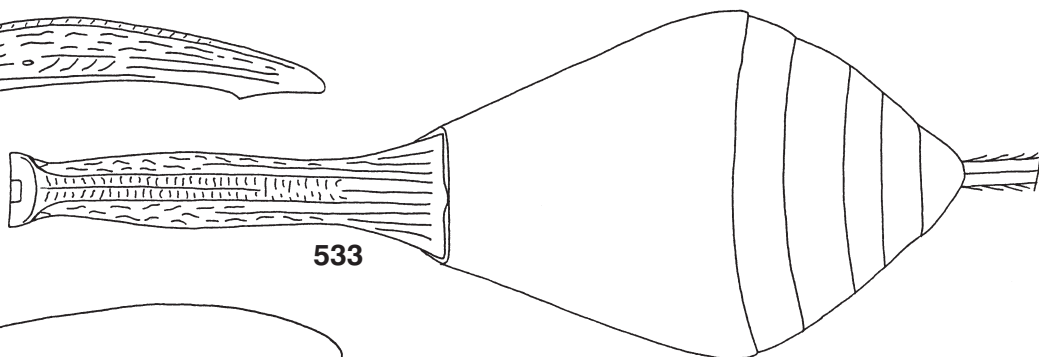
530



531



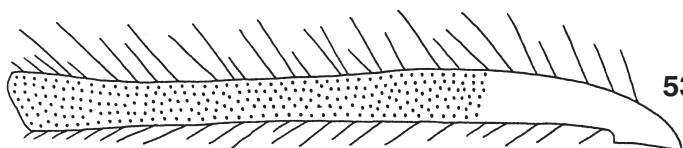
532



533



534



535

Figures 523–535. *S. yunnanensis*: (523) head, frontal view, (524) head, dorsal view, (525) head, lateral view, (526) 2 basal segments of antenna, (527) mesosoma, lateral view, (528) propodeum, (529) fore wing, (530) hind wing, (531) hind coxa, (532) petiole, lateral view, (533) metasoma, dorsal view, (534) hind femur, (535) hind tibia.

metacarpus 1.2 times as long as pterostigma. Second radial abscissa 5.0 times first abscissa and forming distinct angle with it, 0.6 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.0 times maximum width, 1.35 times length of brachial cell. Recurrent vein about 2.5 times second abscissa of medial vein. Nervulus slightly postfurcal and almost perpendicular to anal vein. Brachial cell closed behind level of recurrent vein. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing 5.5 times as long as wide. First costal abscissa about 0.5 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein unsclerotized, distinctly oblique toward base, strongly antefurcal.

Legs. Fore tibia with numerous small spines arranged in narrow stripe. Hind coxa rather long (its length 1.8 times maximum width), with distinct basoventral tooth and corner. Hind femur elongate-oval, 3.5 times as long as wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined. Second tarsal segment 0.55 times as long as basitarsus, 1.1 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, distinctly and regularly curved dorsally, thickened in basal half; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with indistinct spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 3.3 times its apical width, 1.8 times length of propodeum; apical width 1.5 times width at level of spiracles. Second suture indistinct. Median length of second and third tergites combined about twice basal width of second tergite, 0.8 times their maximum width. Ovipositor straight. Ovipositor sheaths 1.3 times as long as petiole, almost as long as hind tibia, 0.4 times as long as fore wing.

Sculpture and pubescence. Vertex, frons and face strongly transversely striate at most part, face medially and temple smooth. Mesoscutum densely and distinctly granulate, with fine and usually short rugae near notauli, with 2 almost straight and parallel carinae medioposteriorly. Scutellum densely granulate. Mesopleura very finely striate, widely almost smooth medially. Propodeum with distinctly marginate areas, areola rather small and short, pentagonal; petiolate area rather short, distinctly separated from areola by high carina; propodeum distinctly densely rugose, fine and densely granulate in basolateral areas; basal carina 1.5 times as long as fork of areola. Hind coxa granulate with striation dorsally. Hind femur smooth. Petiole rugose-striate, only striate in apical $\frac{1}{4}$. Rest of tergites smooth. Mesoscutum with rather sparse, long, semi-erect hairs along notauli and marginally. Dorsal surface of hind tibia with long rather dense and semi-erect hairs, their length 0.9–1.3 times maximum width of tibia.

Colour. Body dark reddish brown, head and mesoscutum light reddish brown, second and third tergites reddish brown. Antennae (from Chao description) with 9 pale seg-

ments in apical half. Palpi yellow. Legs yellow, hind coxa in basal $\frac{2}{3}$, middle tibia medially and hind tibia in distal $\frac{2}{3}$ brown. Ovipositor sheath brown, yellow basally. Fore wing infusate. Pterostigma brown, pale in basal $\frac{1}{4}$.

Discussion. This species is in the *S. fasciatus* Walker group and in Nixon's key runs to couplet 49 (page 209). This species is similar to *S. gades* Nixon and their differences are indicated in the following key:

- 49a. Head and mesoscutum light reddish brown. Posterior declivous part of vertex with coarse and weakly curved posteriorly striae. Pronotal keel widely fused with posterior margin of pronotum. Basal carina of propodeum 1.5 times as long as fork of areola. Propodeum without lateral tubercles *S. yunnanensis* Chao
 - Head and mesoscutum reddish brown. Posterior declivous part of vertex almost smooth. Pronotal keel usually separated from posterior margin of pronotum. Basal carina of propodeum 0.7–1.0 times as long as fork of areola. Propodeum with distinct lateral tubercles
 *S. gades* Nixon

This species is also similar to *S. helle* Nixon (Nixon 1943: couplet 51, page 209); their differences are indicated below.

- 51a. Transverse diameter of eye 1.5 times temple length. Petiole about twice as long as apical width, 1.5 times as long as propodeum. Vertex almost entirely smooth. Mesoscutum without rugae near notauli. Basal carina of propodeum 0.6 times as long as fork of areola. Hind coxa entirely yellow *S. helle* Nixon
 - Transverse diameter of eye 2.2 times temple length. Petiole 3.3 times as long as apical width, 1.8 times as long as propodeum. Vertex strongly and entirely striate. Mesoscutum with weak but distinct rugae near notauli. Basal carina of propodeum 1.5 times as long as fork of areola. Hind coxa brown at most part
 *S. yunnanensis* Chao

This species is very similar to the Japanese *S. vladimiri* Belokobylskij and their differences are indicated below:

1. Mesopleura medially smooth at most part. Basal carina of propodeum 1.5 times as long as fork of areola. Hind femur smooth. Ovipositor sheath 0.4 times as long as fore wing. Hind femur entirely yellow *S. yunnanensis* Chao
 - Mesopleura medially distinctly rugose-granulate. Basal carina of propodeum almost as long as fork of areola. Hind femur finely granulate. Ovipositor sheath 0.6 times as long as fore wing. Hind femur yellow with large dark reddish brown spot in posterior half . . . *S. vladimiri* Belokobylskij

Group of *Spathius imbecillus* Enderlein

Spathius sumatranus (Enderlein, 1912)

(Figs 536–546)

Stenophasmus sumatranus Enderlein, 1912: 9.

Spathius sumatranus: Nixon 1943: 450; Shenefelt and Marsh 1976: 1420.

Material. Lectotype (designated here for stability of nomenclature): female, "Sumatra, Soekaranda, Dr. H. Dohrn S.", "Type" (red), "*Stenophasmus sumatranus* Enderl. ♀, type, Dr. Enderlein det. 1911", "Mus. Zool. Polonicum, Warszawa 12/45" (MIZW).

Paralectotype (metasoma behind petiole missing): female, "Sumatra, Soekaranda, Dr. H. Dohrn S.", "Co-Typus" (yellow), "*Stenophasmus sumatranus* Enderl. ♀, type, Dr. Enderlein det. 1911" (MIZW).

Description. Female. Body length 8.8 mm; fore wing length 5.0 mm. Head not depressed, its width 1.2 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.55 times length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL 1.2 times Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as broad. Malar space height 0.5 times eye height and 0.9 times basal width of mandible. Face width 1.1 times eye height and equal to height of face and clypeus combined. Clypeal suture complete, but shallow and narrow. Hypoclypeal depression rather large and round, its width 0.8 times distance from edge of depression to eye, 0.5 times width of face. Occipital carina absent at short distance near mandible and not fused with hypostomal carina. Hypostomal flange rather wide. Vertex convex.

Antennae slender, filiform, more than 26-segmented (apical segments missing). Scape 1.5 times as long as wide. First flagellar segment 6.5 times as long as its apical width, 1.1 times as long as second segment. Submedian segments 4.3–4.5 times as long as wide.

Mesosoma. Length of mesosoma 2.4 times its height. Pronotal keel distinct, posterior branch widely separated from posterior margin of pronotum, anterior branch fine and situated submedially. Pronotum subanteriorly without distinct carina. Pronotal lateral depression wide, shallow, not marginated, smooth in anterior half and sparsely crenulate in posterior half. Mesoscutum weakly and roundly raised above pronotum. Notauli shallow, wide, almost complete, distinctly crenulate. Prescutellar depression almost entirely smooth, but with fine striation anteriorly, with high median carina, 0.25 times as long as scutellum. Scutellum weakly convex, with almost complete lateral carinae. Subalar depression shallow, wide, smooth. Sternauli shallow (especially posteriorly), weakly S-shaped, sparsely crenulate, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metanotum with very short and wide tooth. Metapleural flange short and wide. Propodeum without lateral tubercles.

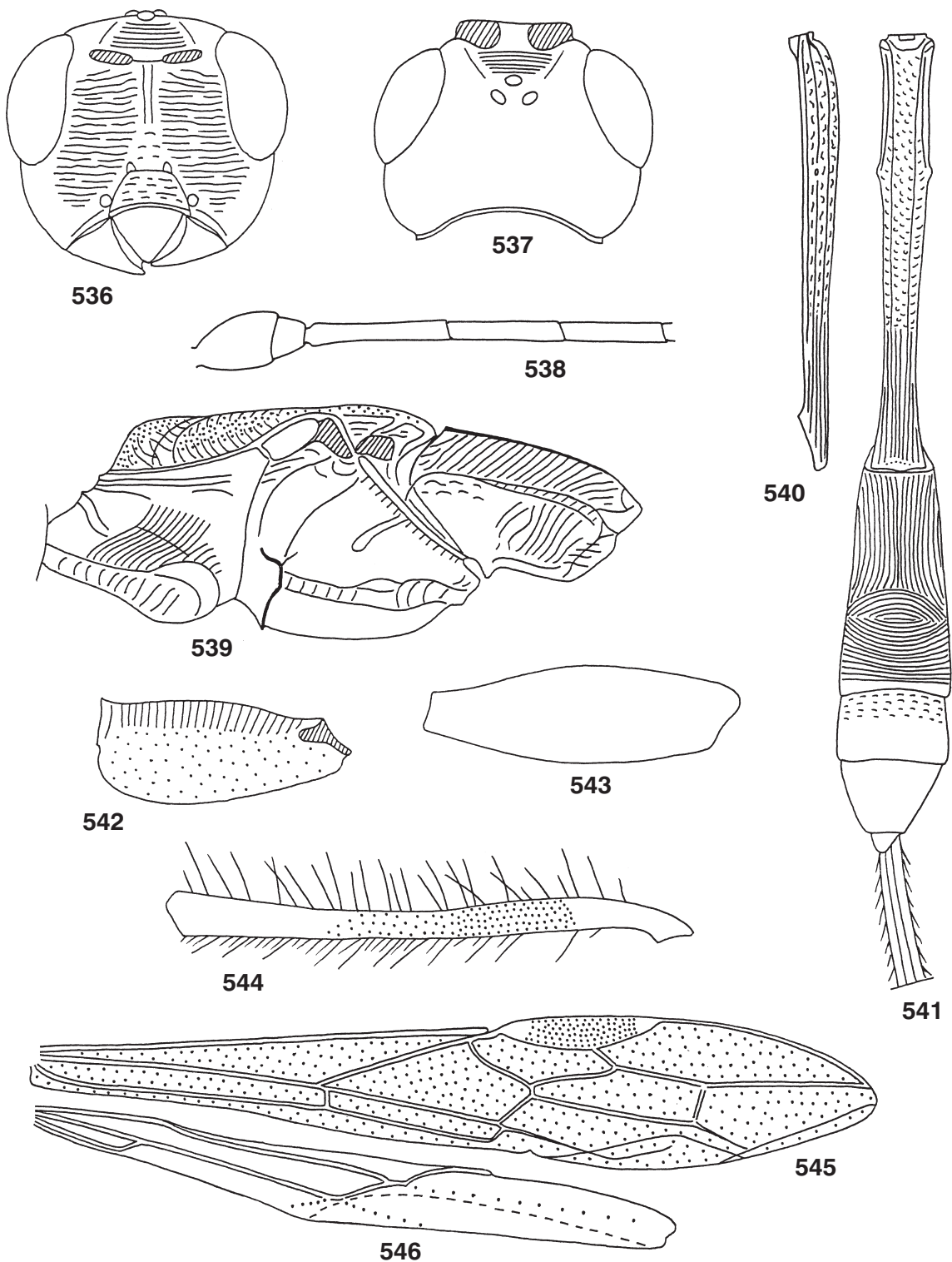
Wings. Fore wing almost 6.0 times as long as wide. Pterostigma 5.0 times as long as wide. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 3.5 times first abscissa and forming very obtuse angle with it, 0.5 times third abscissa, almost equal to first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.5 times maximum width, 0.9

times length of narrow brachial cell. Recurrent vein 3.0 times second abscissa of medial vein. Nervulus perpendicular to anal vein. Distance from nervulus to basal vein 0.45 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{5}$ of distal vein of brachial cell. Mediocubital vein not curved to anal vein in distal half. Hind wing almost 8.0 times as long as wide. First costal abscissa 0.55 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein short, faintly sclerotized, weakly antefurcal.

Legs. Fore tibia with rather dense numerous spines arranged in narrow stripe. Hind coxa long (its length 2.3 times maximum width), without basoventral tooth and corner. Hind femur 3.3 times as long as wide. Hind tibia with 3 slender apical spines on outer margin. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.7 times as long as basitarsus, twice as long as fifth segment (without pretarsus); third segment almost equal to fifth one.

Metasoma. Petiole (lateral view) straight ventrally and dorsally, thickened in basal $\frac{1}{6}$; narrowed from spiracular tubercles to subapical $\frac{1}{5}$, weakly widened in apical $\frac{1}{5}$ (dorsal view), with small spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 9.0 times its apical width, 3.2 times length of propodeum, almost twice length of second and third tergites combined; apical width 1.85 times its minimum width, 1.15 times width at level of spiracles. Second tergite entirely and third in basal $\frac{1}{4}$ with separated laterotergites. Second suture indistinct. Median length of second and third tergites combined 4 times basal width of second tergite, 2.2 times their maximum width. Ovipositor almost straight. Ovipositor sheath twice as long as metasoma, 3.7 times as long as petiole, 1.2 times as long as body, twice as long as fore wing.

Sculpture and pubescence. Vertex smooth. Frons finely transversely striate, almost smooth laterally. Face coarsely rugose. Temple smooth. Mesoscutum densely and finely coriaceous, with rather long transverse striation along notauli, with transverse undulate striae on wide medioposterior area. Scutellum almost smooth at posterior part, finely rugulose posteriorly. Mesopleura entirely smooth. Metapleura almost smooth in anterior $\frac{1}{5}$, widely and distinctly transversely striate in posterior $\frac{2}{5}$. Propodeum coarsely curvedly transversely striate, very finely rugulose-coriaceous basally, sparsely rugose apically, without marginate areas, with short basal carina in basal $\frac{1}{5}$ and long lateral carinae in basal $\frac{2}{5}$. Hind coxa very finely coriaceous, transversely striate dorsally. Hind femur smooth. Hind tibia smooth dorsally, densely longitudinally striate on ventral half. Petiole sparsely and finely striate and finely coriaceous between striae in basal $\frac{1}{5}$, only finely coriaceous on median $\frac{1}{5}$, densely striate in apical $\frac{1}{5}$. Second tergite densely longitudinally aciculate. Third tergite densely semicircularly transversely aciculate. Fourth tergite



Figures 536–546. *S. sumatranus*: (536) head, frontal view, (537) head, dorsal view, (538) 5 basal segments of antenna, (539) mesosoma, lateral view, (540) petiole, lateral view, (541) metasoma, dorsal view, (542) hind coxa, (543) hind femur, (544) hind tibia, (545) fore wing, (546) hind wing.

very finely aciculate basally, smooth apically. Rest of tergites smooth. Mesoscutum with sparse long almost erect hairs situated widely along notauli and narrowly marginally. Mesopleura widely bare. Hairs on dorsal surface of hind tibia sparse long and erect, their length 1.2–1.5 times maximum width of tibia.

Colour. Head and mesosoma dark reddish brown, almost black partly. Petiole, second and third tergites entirely and apex of metasoma light reddish brown; fourth and fifth tergites reddish brown to dark. Scape and pedicel brownish yellow, flagellum light reddish brown, faintly darkened toward apex. Palpi yellow. Fore and middle legs yellow, faintly darkened apically; hind leg brownish yellow, hind tibia faintly darkened, without light basal ring. Ovipositor sheath brown, pale basally. Fore wing faintly and entirely infuscate. Pterostigma brown, pale basally and apically.

Discussion. This species is in the *S. imbecillus* (Enderlein) group. Study of the holotype of *S. imbecillus* (Enderlein) [female, "Siluas, Sambas, W. Borneo, 22/26.7.03, Micholitz", "Type" (red), "*Stenophasmus imbecillus* Enderl. ♀, Type, Dr Enderlein det. 1911", "Zool. Mus. Berlin" (MNHU)] and the lectotype of *S. sumatranus* (Enderlein) indicated conclusively that it is the same species (**syn. nov.**). The differences indicated by Enderlein (1912) for separating these species are only features of intraspecific variation.

Distribution. Indonesia (Sumatra).

Group of *Spathius insignis* Granger (new group)

Diagnosis. Head behind eyes distinctly narrowed. Vertex almost flat and coarsely striate. Hypoclypeal cavity round and rather small. Tentorial pits large. Mesoscutum rather weakly and gradually arising above pronotum. Notauli complete. Metapleural flange absent. Propodeum without areolation, with basal carina only. Fore wing strongly maculate. Second radial abscissa about twice as long as third abscissa. Mediocubital vein distinctly curved toward anal vein in distal half. Brachial cell closed before recurrent vein. Parallel vein interstitial. Hind coxa without basoventral tooth and corner. Hind tibia without apical spines and with very short and sparse hairs. Petiole rather slender and not long, almost straight. Second-fourth tergites with separated laterotergites. Second and third tergites densely and finely granulate, fourth tergite finely coriaceous. Ovipositor sheath distinctly shorter than metasoma.

This group is similar to *S. pompelon* Nixon group (Nixon 1943: couplet 20, page 193) and their differences are indicated in the following key:

21a. Second radial abscissa shorter than third abscissa. Parallel vein not interstitial; brachial cell closed behind recurrent vein. Mediocubital vein weakly curved in distal

half. Hind coxa with basoventral tooth and corner. Tentorial pits small. Hind tibia apically with spines. Oriental region group of *S. pompelon* Nixon
 - Second radial abscissa twice longer than third abscissa. Parallel vein interstitial; brachial cell closed before recurrent vein. Mediocubital vein strongly curved in distal half. Hind coxa without basoventral tooth and corner. Tentorial pits large. Hind tibia apically without spines. Afrotropical region group of *S. insignis* Granger

This group can be also similar to *S. trochanteratus* Szépligeti group (Nixon 1943: couplet 28, page 194); their differences are indicated in the following key:

28a. Fore wing not maculate. Vertex completely smooth. Pronotal keel separated from posterior margin of pronotum. Propodeum with marginated areas. Hind tibia with very long hairs and with apical spines. Second radial abscissa shorter than third abscissa. Parallel vein not interstitial; brachial cell closed behind recurrent vein group of *S. trochanteratus* Szépligeti
 - Fore wing distinctly maculate. Vertex completely strigose. Pronotal keel widely fused with posterior margin of pronotum. Propodeum without marginated areas. Hind tibia with very short hairs and without apical spines. Second radial abscissa twice longer than third abscissa. Parallel vein interstitial; brachial cell closed before recurrent vein group of *S. insignis* Granger

Spathius insignis Granger, 1949 (Figs 547–558)

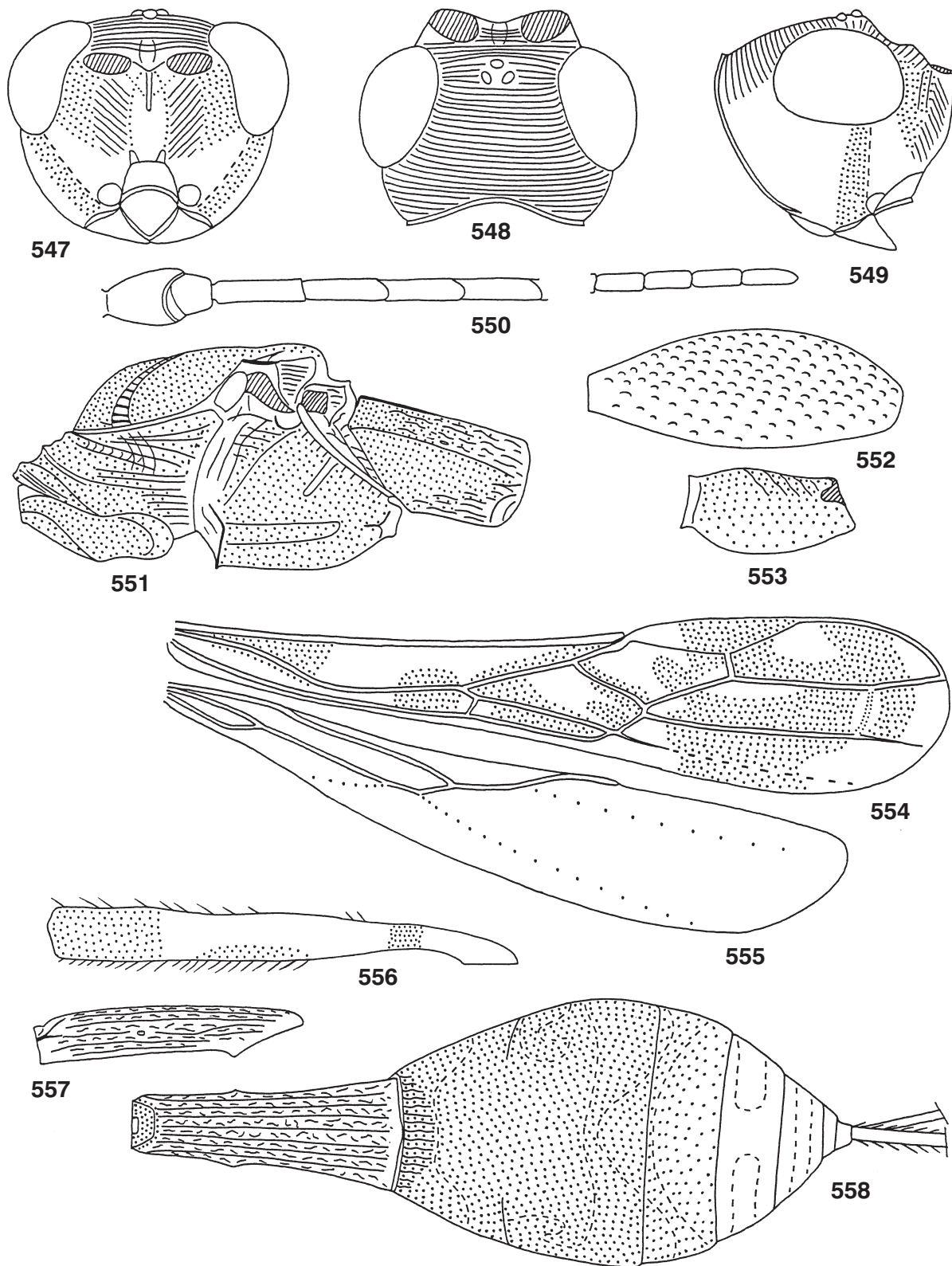
Spathius insignis Granger, 1949: 147; Shenefelt and Marsh 1076: 1406.

Material. Lectotype (designated here for stability of nomenclature): female, "Madagascar, Bekily, reg. sud de l'île", "Museum Paris, X-36, A. Seyrig", "32", "Type" (MNHN).

Paralectotype: 1 female, "Madagascar, Bekily, reg. sud de l'île", "Museum Paris, IX-38, A. Seyrig" (MNHN).

Description. Female. Body length 4.0–4.5 mm; fore wing length 2.6–3.0 mm. Head not depressed, its width 1.30–1.45 times median length. Head behind eyes weakly roundly narrowed. Transverse diameter of eye 1.8–2.0 times length of temple. Ocelli small, in almost equilateral triangle; POL 0.7–0.8 times Od, 0.30–0.35 times OOL. Eye glabrous, 1.1–1.2 times as high as broad. Malar space height 0.70–0.75 times eye height and 1.5–1.7 times basal width of mandible. Face width 1.10–1.25 times eye height and 1.2–1.4 times height of face and clypeus combined. Tentorial pits large. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.5–0.6 times distance from edge of depression to eye, 0.35–0.40 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Postgenal bridge rather wide. Vertex flat.

Antennae rather thick, filiform, 32-segmented, 1.1 times as long as body. Scape about 1.5 times as long as



Figures 547–558. *S. insignis*: (547) head, frontal view, (548) head, dorsal view, (549) head, lateral view, (550) basal and apical segments of antenna, (551) mesosoma, lateral view, (552) hind femur, (553) hind coxa, (554) fore wing, (555) hind wing, (556) hind tibia, (557) petiole, lateral view, (558) metasoma, dorsal view.

wide. First flagellar segment 4.3 times as long as its apical width, 1.10–1.15 times as long as second segment. Penultimate segment 2.8 times as long as wide, 0.5 times as long as first segment, 0.9 times as long as apical segment; the latter shortly pointed apically.

Mesosoma. Length of mesosoma 2.0–2.2 times its height. Pronotum long. Pronotal keel rather fine, posterior branch widely fused medially with posterior margin of pronotum; anterior branch fine and situated submedially. Pronotum with fine transverse carina in anterior $\frac{1}{4}$. Pronotal lateral depression shallow, rather narrow, marginate, densely crenulate. Mesoscutum not highly and obliquely-roundly raised above pronotum. Median lobe without depression. Notauli deep, wide, complete, densely crenulate. Prescutellar depression deep, long, finely rugulose, with median carina, 0.33 times as long as scutellum. Scutellum convex, with complete lateral carinae. Subalar depression deep, narrow, granulate-rugulose. Sternauli shallow, somewhat deeper in posterior $\frac{1}{4}$, straight, oblique, finely and densely coriaceous, running along anterior $\frac{3}{5}$ of lower part of mesopleura. Postpectal carina absent. Metanotum with short and pointed tooth. Metapleural flange absent. Propodeum long and narrow, without lateral tubercles.

Wings. Fore wing 4.0–4.5 times as long as wide. Pterostigma 4.7–4.8 times as long as wide. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened; metacarpus almost as long as pterostigma. Second radial abscissa 6.0–7.0 times first abscissa and forming almost right angle with it, almost twice third abscissa, 1.6–1.7 times first radiomedial vein. Second radiomedial cell weakly widened distally, its length 4.0–4.3 times maximum width, 1.6 times length of wide brachial cell. Recurrent vein 3.0–4.5 times second abscissa of medial vein. Nervulus distinctly oblique towards base of wing. Distance from nervulus to basal vein 0.4–0.5 times nervulus length. Parallel vein interstitial. Brachial cell closed weakly before or at level of recurrent vein. Mediocubital vein strongly curved to anal vein in distal half. Hind wing 5.0–5.2 times as long as wide. First costal abscissa 0.6–0.7 times second abscissa. First abscissa of mediocubital vein 0.5–0.6 times second abscissa. Recurrent vein unsclerotized, oblique, strongly antefurcal.

Legs. Fore tibia with very sparse small spines arranged in one row. Hind coxa rather small (its length 1.7–1.8 times maximum width), without basoventral tooth and corner. Hind femur 2.6 times as long as wide. Hind tibia without apical spines on outer margin. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined. Second tarsal segment 0.40–0.45 times as long as basitarsus, almost as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) straight ventrally, dorsally slightly and regularly curved in basal $\frac{1}{4}$ and almost straight in apical $\frac{3}{4}$, weakly thickened in basal $\frac{1}{5}$;

distinctly widened in apical $\frac{1}{3}$, with small spiracular tubercles in basal $\frac{1}{3}$ (dorsal view). Length of petiole 2.2–2.3 times its apical width, about 1.5 times length of propodeum; apical width 1.7–1.8 times width at level of spiracles, 2.3 times its minimum width. Second-fourth tergites with separated laterotergites. Second suture very fine or indistinct. Median length of second and third tergites combined twice basal width of second tergite, 0.9 times their maximum width. Ovipositor straight. Ovipositor sheath 0.45–0.55 times as long as metasoma, 1.2–1.5 times as long as petiole, 0.6–0.7 times as long as mesosoma, 0.3–0.4 times as long as fore wing.

Sculpture and pubescence. Vertex and frons densely and coarsely transversely striate. Face densely granulate, with wide additional striation medially in upper $\frac{1}{3}$. Temple striate-coriaceous in upper $\frac{1}{3}$, smooth in lower $\frac{2}{3}$. Mesoscutum finely and densely granulate, without striae along notauli, with single median carina in posterior half and short rugulosity around this carina. Scutellum finely granulate. Mesopleura granulate in upper $\frac{1}{3}$, coriaceous in lower $\frac{2}{3}$. Metapleura densely granulate, additionally with dense rugulosity in posterior half. Propodeum rugose-reticulate at most part, reticulate-granulate basally; without marginate areas; with basal carina in basal $\frac{1}{2}$ – $\frac{2}{3}$. Hind coxa coriaceous dorsally, granulate in anterior half, granulate-striate in posterior half. Hind femur coriaceous in dorsal half, finely coriaceous in ventral half. Hind tibia granulate. Petiole densely rugose with undulate striae, sometimes finely granulate in apical $\frac{1}{3}$. Second and third tergites densely and finely granulate; second tergite shortly striate basally sometimes. Fourth or fourth and fifth tergites finely coriaceous. Rest of tergites smooth. Mesoscutum with rather dense short semi-erect hairs situated along notauli and marginally. Hairs on dorsal surface of hind tibia very short, sparse, semi-erect, their length 0.2–0.3 times maximum width of tibia; hairs on ventral surface dense and short.

Colour. Head and mesosoma yellow, propodeum and propleura light reddish brown, metanotum and mesosoma ventrally dark reddish brown; sometimes mesosoma light reddish brown, dark ventrally and on metanotum, promesosoma and mesonotum yellow. Petiole reddish brown, rest of tergites dark reddish brown, second and third tergites at most part medially, fourth tergite at small mediobasal spot and apex of metasoma brownish yellow. Two basal segments of antenna light reddish brown, flagellum yellow, faintly darkened toward apex, yellow apically. Three basal segments of palpi reddish brown, rest apical segments yellow. Legs yellow, hind leg brownish: coxa and trochantellus apically, femur dorsally and ventrally in apical $\frac{3}{4}$, tibia shortly subbasally and widely apically. Hind tibia apically yellow; all fifth tarsal segments brown. Ovipositor sheath yellow, brown apically. Fore wing maculate, with intensively brown spots in first and second radiomedial and in radial cells. Pterostigma brown, pale yellow in basal $\frac{1}{3}$.

Discussion. This is a single species in this very distinctly separated new group.

Distribution. Madagascar.

Group of *Spathius labdacus* Nixon

Spathius alexandri Belokobylskij, 1989
(Figs 559–570)

Spathius alexandri Belokobylskij, 1989: 48; 1994: 36; 1998: 83.

Material. Holotype: female, “Mongolia, [Bayan-Hongor aimak], oasis Ehiin-Gol, Kirejtchuk, 23 VII 1982” (ZISP).

Description. Female. Body length 4.7 mm; fore wing length 2.9 mm. Head not depressed, its width 1.5 times median length. Head behind eye weakly convex anteriorly, roundly narrowed posteriorly. Transverse diameter of eye almost equal to length of temple. Occiput distinctly concave. Ocelli medium sized, in triangle with base 1.4 times its sides; POL 1.2 times Od, 0.4 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.6 times height of eye and almost equal to basal width of mandible. Face width 1.1 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression median size and round, its width 0.9 times distance from edge of depression to eye, 0.5 times width of face. Hypostomal flange very narrow. Occipital carina reduced near mandible and not connected to hypostomal carina. Vertex distinctly convex.

Antennae slender, filiform, more than 20-segmented (apical segments missing). Scape 1.75 times as long as wide. First flagellar segment almost 6.0 times as long as its apical width, 1.3 times as long as second segment. Submedian segments 3.3 times as long as wide.

Mesosoma. Length 1.8 times its height. Pronotal keel distinct, posterior branch high, keel-shaped, shortly separated from posterior margin of pronotum; anterior branch fine and situated submedially on pronotum. Pronotum subanteriorly with transverse carina, which is widely interrupted medially. Pronotal lateral depression shallow, wide, almost completely marginate, almost entirely smooth. Mesoscutum distinctly and gradually raised above pronotum. Notauli deep anteriorly, more shallow posteriorly, wide, complete, coarsely and irregularly rugose. Prescutellar depression rather deep, wide, with 5 strong carinae, smooth between carinae, 0.5 times as long as scutellum. Scutellum strongly convex and with lateral carinae. Metanotum without tooth. Sternauli narrow, shallow, weakly oblique, finely crenulate, running along submedian half of lower part of mesopleura. Postpectal carina absent. Metapleural flange short and narrow. Propodeum without lateral tubercles.

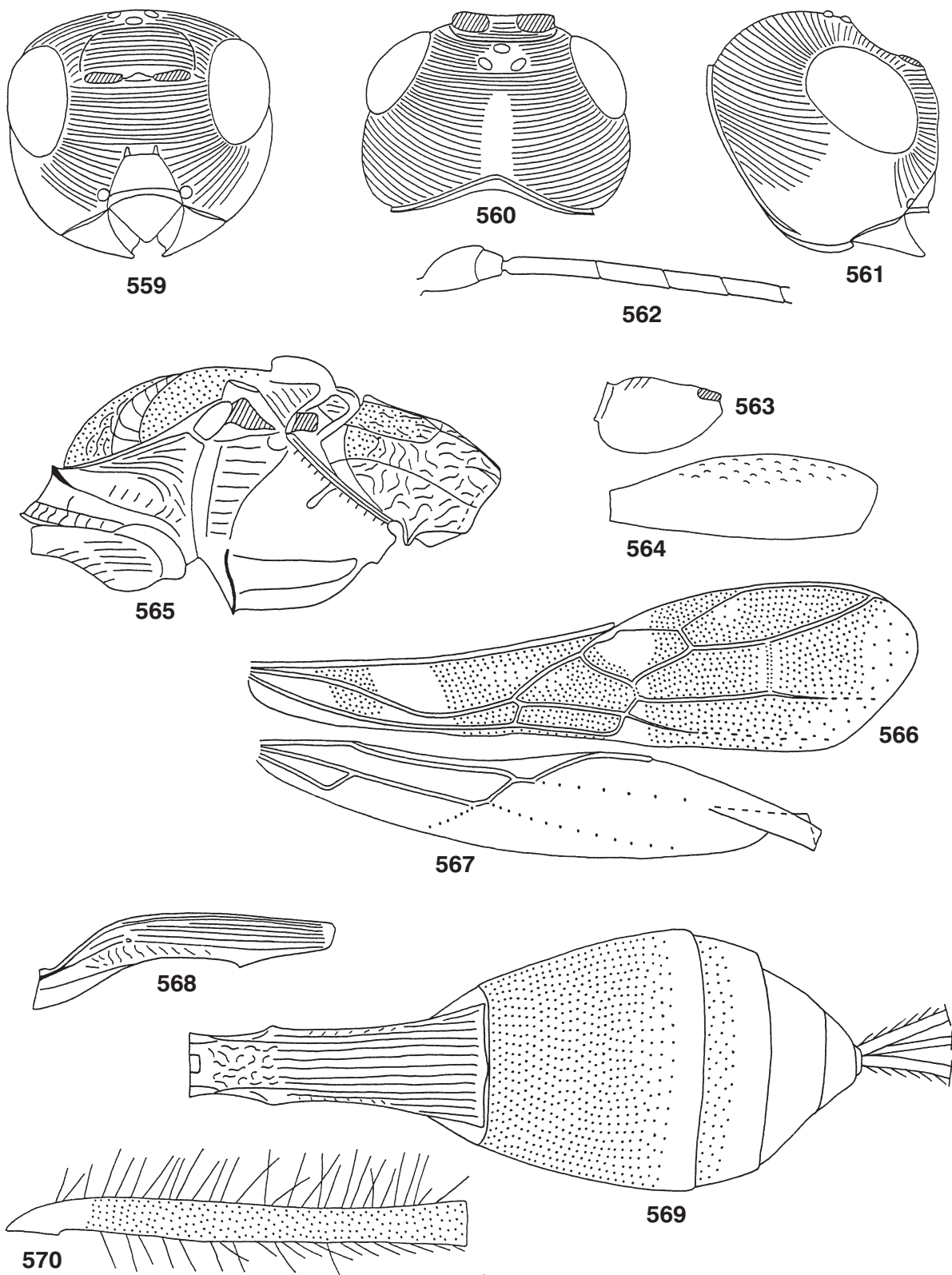
Wings. Fore wing almost 4.0 times as long as wide. Pterostigma 4.5 times as long as wide. Radial vein aris-

ing almost from middle of pterostigma. Radial cell shortened, metacarpus almost as long as pterostigma, 3.5 times as long as distance from apex of radial cell to apex of wing. Second radial abscissa 3.5 times first abscissa and forming distinct angle with it, 0.6 times third abscissa, 1.3 times first radiomedial vein. Second radiomedial cell weakly widened distally, its length 2.8 times maximum width, 1.3 times length of brachial cell. Recurrent vein 1.5 times second abscissa of medial vein. Brachial cell closed on level of recurrent vein. Distance from nervulus to basal vein 0.3 times length of nervulus. Nervulus oblique towards base of wing. Parallel vein interstitial. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 5.3 times as long as wide. First costal abscissa 0.55 times second abscissa. First abscissa of mediocubital vein 0.7 times second abscissa. Recurrent vein long, unsclerotized, strongly curved toward base of wing, interstitial.

Legs. Fore tibia with sparse thick several spines arranged in rather narrow stripe. Hind coxa small (its length 1.6 times maximum width), without basoventral tooth and corner. Hind femur elongate-oval, 3.3 times as long as wide. Hind tibia apically with 5 slender spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined. Second tarsal segment 0.5 times as long as basitarsus, 1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) regularly curved ventrally, distinctly and more or less regularly curved dorsally, weakly thickened in basal half; distinctly and quite regularly widened toward apex (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.4 times its apical width, twice length of propodeum; apical width 1.8 times width at level of spiracles. Second and anterior half of third tergites with weakly separated laterotergites. Second suture fine. Median length of second and third tergites combined 1.5 times basal width of second tergite, 0.9 times their maximum width. Ovipositor weakly curved up. Ovipositor sheath 1.8 times as long as metasoma, 2.5 times as long as mesosoma, 1.4 times as long as fore wing.

Sculpture and pubescence. Vertex and frons distinctly transverse striate, striae more fine on middle of vertex. Face densely transversely striate, semicircularly striate below. Temple densely and distinctly semicircularly striate in upper $\frac{3}{4}$, smooth on below $\frac{1}{4}$. Mesoscutum densely and very finely granulate-coriaceous, without distinct rugae near notauli; with 2 distinct subparallel carinae in medioposterior half and dense rugosity between striae. Scutellum very finely granulate. Mesopleura smooth, finely and interruptedly striate posteriorly. Propodeum with finely marginate areas, areola narrow and small, pentagonal; petiolate area short, indistinctly separated from areola; propodeum almost entirely densely coarsely rugose-reticulate, almost



Figures 559–570. *S. alexandri*: (559) head, frontal view, (560) head, dorsal view, (561) head, lateral view, (562) 6 basal segments of antenna, (563) hind coxa, (564) hind femur, (565) mesosoma, lateral view, (566) fore wing, (567) hind wing, (568) petiole, lateral view, (569) metasoma, dorsal view, (570) hind tibia.

smooth posteriorly at short area; basal carina almost twice as long as fork of areola. Hind coxa almost entirely smooth. Hind femur finely or very finely coriaceous-striate in upper half, smooth on rest part. Petiole densely striate, rugose-reticulate in basal $\frac{1}{4}$. Second and third tergites densely and finely granulate-coriaceous, rest of tergites almost smooth. Mesoscutum with very sparse long semi-erect hairs along notauli, anteriorly and marginally. Mesopleura widely bare. Dorsal surface of hind tibia with long sparse erect hairs, their length 1.0–1.5 times maximum width of tibia.

Colour. Head, propodeum and petiole brownish yellow, rest parts of mesosoma light reddish brown, metasoma behind petiole dark reddish brown, almost black. Antennae yellowish brown, infusate apically. Palpi dark reddish brown, fifth segment of maxillary palpus pale. Legs brownish yellow, all trochanters and base of all femora infusate; all tibiae reddish brown, hind tibia paler basally; base and apex of first-fourth tarsal segments pale yellow (sometimes on wide distance), their rest parts and all fifth segment reddish brown to dark reddish brown. Ovipositor sheath dark reddish brown, pale basally. Fore wing widely maculate. Pterostigma dark brown, pale yellow in basal $\frac{1}{3}$.

Discussion. This species is in the *S. labdacus* Nixon group and in Nixon's key is most similar to *S. labdacus* Nixon (Nixon 1943: couplet 2, page 371). The differences between these species are indicated in the following key:

2. Pronotal keel obsolescent. Ovipositor sheaths hardly $\frac{2}{3}$ as long as whole metasoma *S. ochus* Nixon
 – Pronotal keel sharp. Ovipositor sheaths not shorter than whole metasoma **2a**
 2a. Temple long, almost as long as transverse diameter of eye. Head behind eyes distinctly widened. Vertex with smoothed striation. Mesopleura smooth at most part. Pronotal keel more closely situated to posterior margin of pronotum and less large. First tergite only striate at most part. Radial cell distinctly shortened *S. alexandri* Belokobylskij
 – Temple short, about half as long as transverse diameter of eye. Head behind eyes distinctly narrowed. Vertex striate with dense rugulosity between striae. Mesopleura rugose-reticulate at most part. Pronotal keel widely separated from posterior margin of pronotum and large. First tergite striate-rugose at most part. Radial cell not shortened *S. labdacus* Nixon

This species is closely similar to *S. polonicus* Niezabitowski; the differences between these species are indicated after the redescription of *S. polonicus*.

Distribution. Mongolia.

Spathius polonicus Niezabitowski, 1910

(Figs 571–583)

Spathius polonicus Niezabitowski, 1910: 67; Nixon 1943: 443; Fischer 1966b: 344; 1970: 708; Shenefelt and Marsh 1976: 1413; Belokobylskij, 1989: 44.

Spathius melanophilae Fischer, 1966b: 341; Belokobylskij 1989: 44 (as synonym of *S. polonicus*).

Spathius radjabii Fischer, 1970: 705; Belokobylskij 1989: 44 (as synonym of *S. polonicus*).

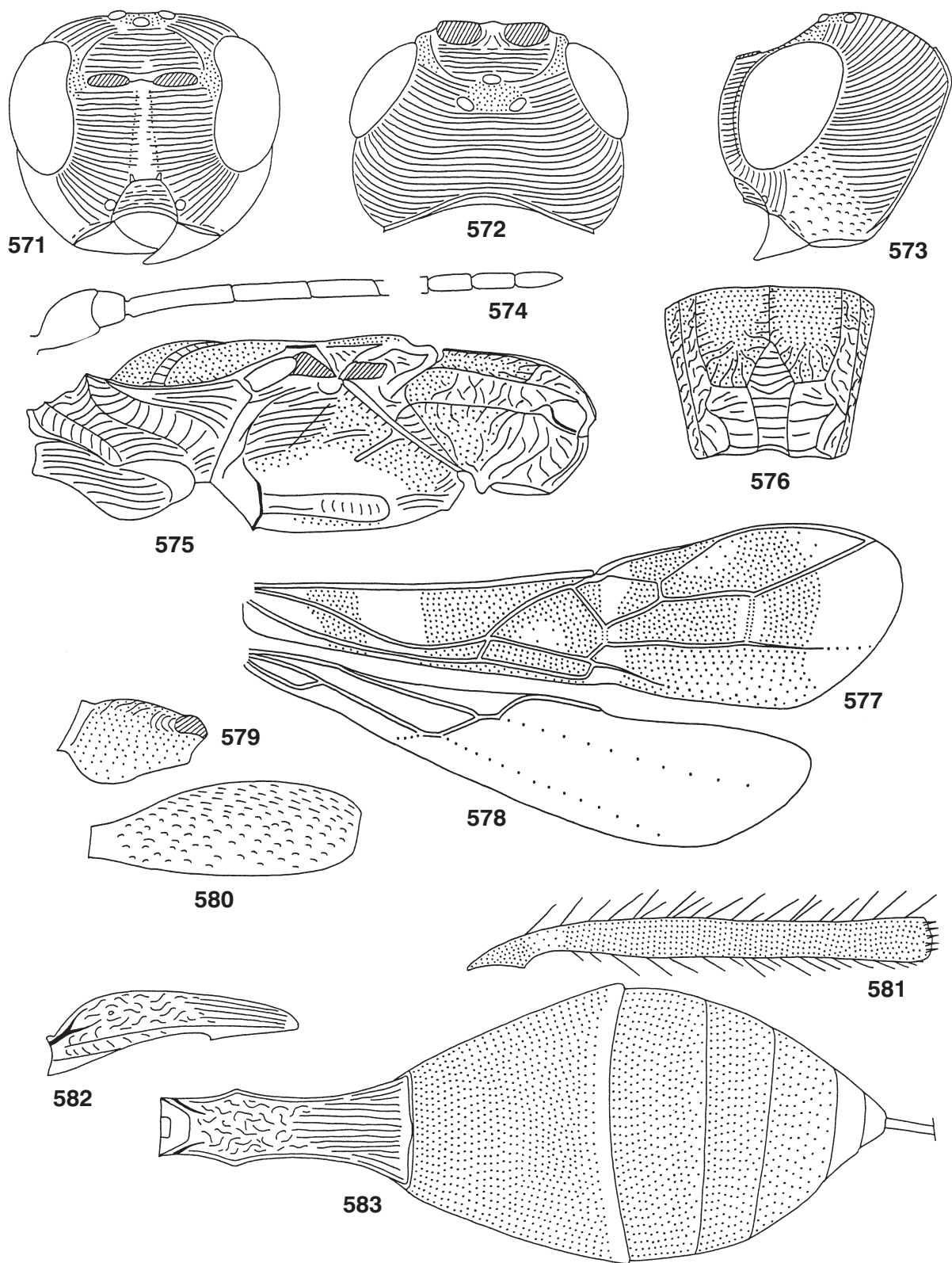
Material. Neotype (designated here for stability of the nomenclature): female, "Byelorussia, Khojnyki, 24.VII-28.VIII.1990, Chernobyl zone, M.t., Dron'ki, N 1, A. Tereshkin leg." (ZISP). Holotype of *S. melanophilae* Fischer: 1 female, Spain, "Tozo (Zamora), ex *Melanophila picta*, 25 IV 1964" (MHNG). Paratypes of *S. radjabii* Fischer: 1 female, 1 male "Iran, Teheran, Karadj, V et VI 1968, Radjabi leg.", "n 1. *Sphenoptera davatchii*. Sur prunier" (MNHN).

Additional material. Poland: 1 female, "Polonia, Warszawa, Łazienki, *Tilia cordata* I (5 m), 11–30 VIII 1975, leg. Ekipa" (MIZW); 1 male, "Polonia, Warszawa, Ogrod Saski, *Acer* sp. III (5 m), 7–11 VIII 1975, leg. Ekipa" (MIZW).

Description. Female. Body length 2.8–5.8 mm; fore wing length 3.0–5.0 mm. Head not depressed or sometimes more or less depressed, its width about 1.5 times median length. Head behind eye convex anteriorly, roundly narrowed posteriorly. Transverse diameter of eye almost equal to length of temple. Occiput distinctly concave. Ocelli rather small, in triangle with base 1.3–1.5 times its sides; POL 1.5–2.0 times Od, 0.6–0.7 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4–0.5 times height of eye and almost equal to basal width of mandible. Face width almost equal to eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression median size and round, its width 0.8–1.0 times distance from edge of depression to eye, 0.40–0.45 times width of face. Hypostomal flange narrow. Occipital carina reduced near mandible and not fused with hypostomal carina. Vertex more or less convex.

Antennae slender, filiform, 22–40-segmented, not longer than body. Scape 1.6–1.7 times as long as wide. First flagellar segment 5.0–5.5 times as long as its apical width, 1.2–1.3 times as long as second segment. Penultimate segment 2.3–2.7 times as long as wide, about 0.4 times as long as first segment, about 0.8 times as long as apical segment; the latter pointed apically.

Mesosoma often more or less depressed, its length 2.0–2.5 (rarely 3.0) times height. Pronotal keel distinct, posterior branch rather high, shortly separated from posterior margin of pronotum; anterior branch distinct and situated submedially on pronotum. Pronotum sub-anteriorly with transverse carina. Pronotal lateral depression deep, rather narrow, almost completely marginate, finely crenulate and smooth between carinae. Mesoscutum not highly and more or less gradually raised above pronotum. Notauli complete, wide, rather shallow, crenulate. Prescutellar depression deep, rather wide, with 3–5 carinae, smooth or finely granulate between carinae, 0.4–0.5 times as long as scutellum. Scutellum distinctly convex and with lateral carinae.



Figures 571–583. *S. polonicus*: (571) head, frontal view, (572) head, dorsal view, (573) head, lateral view, (574) basal and apical segments of antenna, (575) mesosoma, lateral view, (576) propodeum, (577) fore wing, (578) hind wing, (579) hind coxa, (580) hind femur, (581) hind tibia, (582) petiole, lateral view, (583) metasoma, dorsal view.

Metanotum without tooth. Sternauli rather narrow, deep, almost straight, smooth, running along anterior $\frac{1}{2}$ – $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and wide. Propodeum without lateral tubercles.

Wings. Fore wing 3.6–4.0 times as long as wide. Pterostigma 3.7–4.3 times as long as wide. Radial vein arising almost from or weakly behind middle of pterostigma. Radial cell weakly shortened, metacarpus almost as long as pterostigma, 3.5–4.0 times as long as distance from apex of radial cell to apex of wing. Second radial abscissa 3.0–5.0 times first abscissa and forming distinct and almost straight angle with it, 0.6–0.8 times third abscissa, 1.2–1.4 times first radiomedial vein. Second radiomedial cell not widened distally, its length 2.7–3.2 times maximum width, almost equal to brachial cell. Recurrent vein 1.3–1.5 times second abscissa of medial vein. Brachial cell closed shortly behind level of recurrent vein. Distance from nervulus to basal vein 0.1–0.3 times length of nervulus, sometimes nervulus interstitial. Nervulus oblique towards base of wing. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ – $\frac{1}{3}$ of distal margin of brachial cell. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 4.3–4.5 times as long as wide. First costal abscissa 0.6–0.7 times second abscissa. First abscissa of mediocubital vein 0.6–0.7 times second abscissa. Recurrent vein long, unsclerotized, strongly curved toward base of wing, antefurcal.

Legs. Fore tibia with rather dense thick numerous spines arranged on rather wide stripe. Hind coxa small (its length 1.4–1.6 times maximum width), without basoventral tooth and corner. Hind femur oval, 2.6–3.0 times as long as wide. Hind tibia apically with 4–5 slender spines on outer side. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus about 0.7 times second-fifth segments combined. Second tarsal segment 0.4–0.5 times as long as basitarsus, 1.3–1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) weakly curved ventrally, dorsally distinctly and regularly curved in anterior half and straight in posterior half, thickened in basal half; distinctly and quite regularly widened toward apex (dorsal view), with spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 2.3–2.8 times its apical width, 1.6–1.9 times length of propodeum; apical width 1.3–1.5 times width at level of spiracles. Second tergite with separated laterotergites. Second suture rather distinct. Median length of second and third tergites combined 1.2–1.5 times basal width of second tergite, about 0.8 times their maximum width. Ovipositor almost straight. Ovipositor sheath 0.8–1.2 times as long as metasoma, 1.2–1.5 times as long as mesosoma, 0.70–0.85 times as long as fore wing.

Sculpture and pubescence. Vertex and frons distinctly regularly transversely striate, temple vertically striate at most part with fine sculpture below. Face

transversely striate with fine granulation or reticulation between striae. Mesoscutum densely and finely or very finely granulate-coriaceous, without rugae near notauli; with distinct subparallel long carinae and sparse striae between it in medioposterior half. Scutellum densely and distinctly granulate. Mesopleura almost smooth medially or finely coriaceous partly. Propodeum with finely marginate areas, areola rather wide and long, pentagonal; petiolate area short and subsquare, indistinctly separated from areola; propodeum densely rugose-granulate, only granulate in anterior $\frac{1}{3}$ – $\frac{1}{4}$; basal carina 0.7–1.0 times as long as fork of areola. Hind coxa very finely granulate almost entirely, finely striate dorsally. Hind femur finely or very finely granulate. Petiole coarsely striate with dense rugosity between striae. Rest of tergites densely granulate-coriaceous, granulation becoming more fine toward apex of metasoma. Mesoscutum with sparse short semi-erect hairs along notauli. Mesopleura widely bare. Dorsal surface of hind tibia with rather long dense and semi-erect hairs, their length 0.6–1.0 times maximum width of tibia.

Colour. Body light reddish brown, sometimes head, propodeum and petiole yellow, apical half of metasoma and sometimes mesonotum and mesosternum (rarely all mesosoma) more darker, sometimes almost black. Antennae brownish yellow, infusate apically. Palpi dark reddish brown. Legs light reddish brown, tibiae usually darker; tarsi whitish-yellow, hind tibia paler basally and apically; all fifth segment of tarsi dark reddish brown. Ovipositor sheath light brown, almost black in apical $\frac{1}{4}$. Fore wing hyaline with several large dark spots at most part, with light stripe crossing maximum bent of mediocubital vein. Pterostigma black or dark brown, pale yellow or whitish in basal third.

Hosts. *Melanophila picta* (Pallas), *M. picta* ssp. *decastigma* E., *Ovalisia mirifica* (Muls.), *Cratomerus* sp., *Sphenoptera kaznakovi* Jak., *S. davatchii* Descarp., *Agrilus* sp., *A. viridis* L., *A. constantini* Obenb. (Buprestidae), *Scolytus* sp. (Scolytidae)

Discussion. This species is in the *S. labdacus* Nixon group and in Nixon's key is most similar to *S. labdacus* Nixon (Nixon 1943: couplet 2, page 371). The differences between these species are indicated in the following key:

- 2a. Temple long, almost as long as transverse diameter of eye. Head behind eyes distinctly widened. Vertex with smoothed striation. Mesopleura smooth at most part. Radial cell shortened *S. polonicus* Niezabitowski
– Temple short, about half as long as transverse diameter of eye. Head behind eyes distinctly narrowed. Vertex striate with dense rugosity between striae. Mesopleura rugose-reticulate at most part. Radial cell not shortened *S. labdacus* Nixon

This species is closely similar to *S. alexandri* Belokobylskij (see above); the differences between these species are indicated in the following key:

1. Longitudinal diameter of eye 2.0–2.3 times height of malar space. Hind femur 2.6–3.0 times as long as maximum width. Hairs on dorsal surface of hind tibia almost equal to maximum width of tibia. Ovipositor sheath 0.8–1.2 times as long as metasoma, distinctly shorter than body
 *S. polonicus* Niezabitowski
- Longitudinal diameter of eye 1.5 times height of malar space. Hind femur 3.5 times as long as maximum width. Hairs on dorsal surface of hind tibia about 1.5 times maximum width of tibia. Ovipositor sheath 1.7 times as long as metasoma, slightly shorter than body
 *S. alexandri* Belokobylskij

Distribution. Spain, Netherlands, Switzerland, Czech Republic, Poland, Belarus, Ukraine, Russia (south-east of the European part), Armenia, Azerbaijan, Turkmenistan, Uzbekistan, Tadjikistan, Iran.

Spathius udaegae Belokobylskij, 1994
 (Figs 584–596)

Spathius udaegae Belokobylskij, 1994: 38; 1998: 80.

Material. Holotype: female, Russia, “Primorskii krai, 20 km V Spassk[-Dal'nii], les, 28 VIII 1985, Belokobylskij” (ZISP).

Paratypes. Russia: 7 females and 11 males from Primorskii krai.

Description. Female. Body length 3.5–5.0 mm; fore wing length 2.4–3.3 mm. Head distinctly depressed, its width 1.3–1.5 times median length. Head behind eyes weakly convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye 1.2–1.4 times length of temple. Ocelli rather small, in triangle with base 1.10–1.25 times its sides; POL 1.3–1.7 times Od, 0.5–0.6 times OOL. Eye glabrous, 1.20–1.35 times as high as broad. Malar space height 0.30–0.35 times eye height and 0.6–0.8 times basal width of mandible. Face width almost equal to eye height and 1.2–1.5 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.4 times face width. Occipital carina shortly absent near mandible, not fused with hypostomal carina, complete dorsally. Hypostomal carina narrow. Vertex almost flat or weakly convex.

Antennae rather slender, filiform, 30–37-segmented, slightly longer than body. Scape 1.4–1.6 times as long as wide. First flagellar segment 4.5–5.0 times as long as its apical width, 1.2–1.3 times as long as second segment. Penultimate segment 2.5–3.0 times as long as wide, 0.4–0.5 times as long as first segment, 0.9 times as long as apical segment; the latter weakly pointed apically.

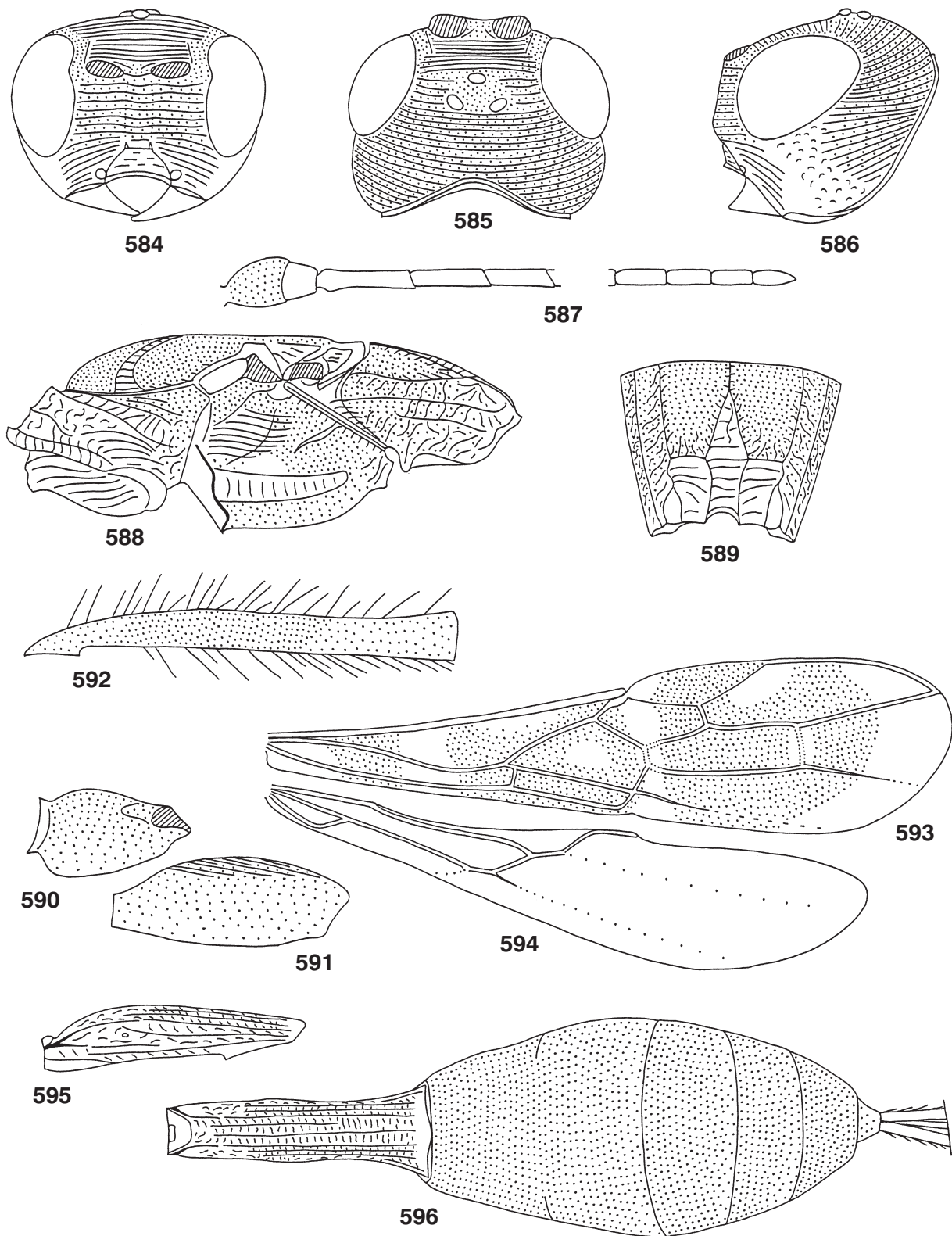
Mesosoma distinctly depressed. Length of mesosoma 2.5–3.5 times its height. Pronotum dorsally distinctly and widely convex. Pronotal keel more or less distinct, its posterior branch rather height and distinctly separated from posterior margin of pronotum; anterior

branch fine and situated nearly middle of pronotum. Pronotum subanteriorly with distinct transverse carina. Pronotal lateral depression rather narrow, distinctly and almost completely marginate, rugulose-crenulate almost entirely. Mesoscutum weakly and gradually raised above pronotum. Notauli rather deep in anterior $\frac{1}{4}$, shallow in posterior $\frac{3}{4}$, narrow, crenulate. Prescutellar depression shallow, short, crenulate-rugose, 0.2–0.3 times as long as scutellum. Scutellum flat, without lateral carinae. Metanotum without tooth. Sternauli shallow, rather narrow, almost straight, crenulate-coriaceous, running along anterior $\frac{3}{4}$ of lower part of mesopleura. Subalar depression rather wide, shallow, rugulose or striate-coriaceous. Postpectal carina absent. Propodeum without tubercles.

Wings. Fore wing 3.8–4.0 times as long as wide. Pterostigma 3.3–3.5 times as long as median width. Radial vein arising slightly before or from middle of pterostigma. Radial cell not shortened, metacarpus 1.2–1.3 times as long as pterostigma. Second radial abscissa 3.3–5.0 times first abscissa and forming weakly obtuse or almost straight angle with it, 0.60–0.75 times the straight third abscissa, 1.3–1.5 times first radiomedial vein. Second radiomedial cell widened distally, its length 3.0–3.5 times maximum width, 1.2–1.4 times length of brachial cell. Recurrent vein 1.5–2.5 times second abscissa of medial vein. Distance from nervulus to basal vein 0.3–0.5 times nervulus length. Brachial cell closed at level of recurrent vein. Parallel vein interstitial. Mediocubital vein strongly curved to anal vein in apical half. Hind wing 4.8–5.0 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein 0.5–0.6 times second abscissa. Recurrent vein long, sclerotized, distinctly antefurcal.

Legs. Hind coxa short (its length 1.5–1.6 times maximum width), without basoventral tooth and corner. Hind femur oval, 2.5–2.7 times as long as wide. Hind tibia apically with 5–6 thick spines on outer side. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6–0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.2–1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) straight ventrally, weakly convex in basal $\frac{1}{4}$ and straight on other part dorsally, distinctly thickened in basal half; widened in apical $\frac{1}{5}$ (dorsal view), with fine spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 2.5–3.0 times its apical width, 1.6–1.8 times length of propodeum; apical width 1.4–1.6 times width at level of spiracles. Laterotergites separated in second and basal $\frac{1}{3}$ – $\frac{1}{2}$ of third tergites. Second suture indistinct. Median length of second and third tergites combined 1.7–2.3 times basal width of second tergite, 0.8–1.0 times their maximum width. Ovipositor sheath 0.60–0.75 times as long as metasoma, 1.7–2.0 times as long as petiole, 0.8–1.1 times as long as mesosoma, 0.5–0.6 times as long as fore wing.



Figures 584–596. *S. udaegae*: (584) head, frontal view; (585) head, dorsal view; (586) head, lateral view; (587) basal and apical segments of antenna; (588) mesosoma, lateral view; (589) propodeum; (590) hind coxa; (591) hind femur; (592) hind tibia; (593) fore wing; (594) hind wing; (595) petiole, lateral view; (596) metasoma, dorsal view.

Sculpture and pubescence. Head densely granulate-coriaceous, with fine additional striae at least partly on vertex and frons. Face coarsely transversely striate, with dense granulation between striae. Temple transversely striate with granulation, very finely coriaceous in below $\frac{1}{4}$. Mesoscutum densely granulate, rugose-striate in rather wide area in medioposterior half; lobes near notauli without distinct rugae. Scutellum densely granulate. Mesopleura granulate-coriaceous, finely coriaceous or almost smooth on below $\frac{1}{8}$. Metapleura closely reticulate-granulate. Propodeum rugose-striate with granulation, densely granulate-coriaceous on long basolateral areas, areas present, but finely marginate, areola long and rather wide, transversely striate, basal carina short, 0.5–0.7 times as long as fork of areola. Hind coxae densely granulate. Hind femur finely granulate-coriaceous, with fine striation dorsally. Hind tibia densely granulate dorsally, densely striate ventrally. Petiole striate, with very densely rugosity between striae; sometimes striation fine. Second-sixth tergites very densely granulate, granulation becoming more fine toward apex of metasoma. Mesoscutum with sparse, rather long and semi-erect hairs along notauli and laterally. Mesopleura bare on wide median part. Hairs of dorsal surface of hind tibia erect, rather dense, long, their length 0.8–1.2 times maximum width of tibia.

Colour. Body dark reddish brown or almost black (at least partly), head (at least ventrally), promesosoma, metapleura and petiole sometimes more or less paler. Antennae dark reddish brown to black in apical $\frac{1}{2}$ – $\frac{3}{4}$, light reddish brown in basal $\frac{1}{2}$ – $\frac{1}{4}$. Palpi (dark) reddish brown, pale apically. Legs reddish brown or light reddish brown, tibiae darker, weakly paler basally, all tarsi light reddish brown or yellowish brown. Ovipositor sheath reddish brown, black in apical $\frac{1}{2}$ – $\frac{1}{3}$. Fore wing distinctly and widely infusate, with several hyaline spots and strips. Pterostigma dark brown, whitish yellow in basal $\frac{1}{4}$.

Male. Body length 3.7–4.2 mm; fore wing length 2.3–2.6 mm. Body usually more strongly depressed. Head behind eyes widened in anterior $\frac{1}{2}$ – $\frac{1}{3}$. Petiole longer and slender, its length 3.3 times apical width, almost twice length of propodeum. Length of second and third tergites combined 2.8–3.0 times basal width of second tergite, 1.2–1.3 times maximum width. Sometimes petiole light reddish brown. Otherwise similar to female.

Discussion. This species is in the *S. labdacus* Nixon group and is closely similar to *S. ochus* Nixon (Nixon 1943: couplet 2, page 371) (the holotype of the latter species has been studied); their differences are indicated in the following key:

2a. Transverse diameter of eye 1.3–1.4 times as long as temple. Frons without or with fine striation. Second radial abscissa 0.70–0.75 times as long as third abscissa. Petiole 1.6–1.8 times as long as propodeum. Basal carina of propodeum 0.5–0.7 times fork of areola *S. udaeegae* Belokobylskij

–. Transverse diameter of eye about twice as long as temple. Frons with distinct striation. Second radial abscissa 0.80–0.85 times as long as third abscissa. Petiole 1.3–1.4 times as long as propodeum. Basal carina of propodeum almost as long as fork of areola *S. ochus* Nixon

Distribution. Russia (Primorskii krai).

Group of *Spathius philotas* Nixon

Spathius melleus Brues, 1918
(Figs 597–608)

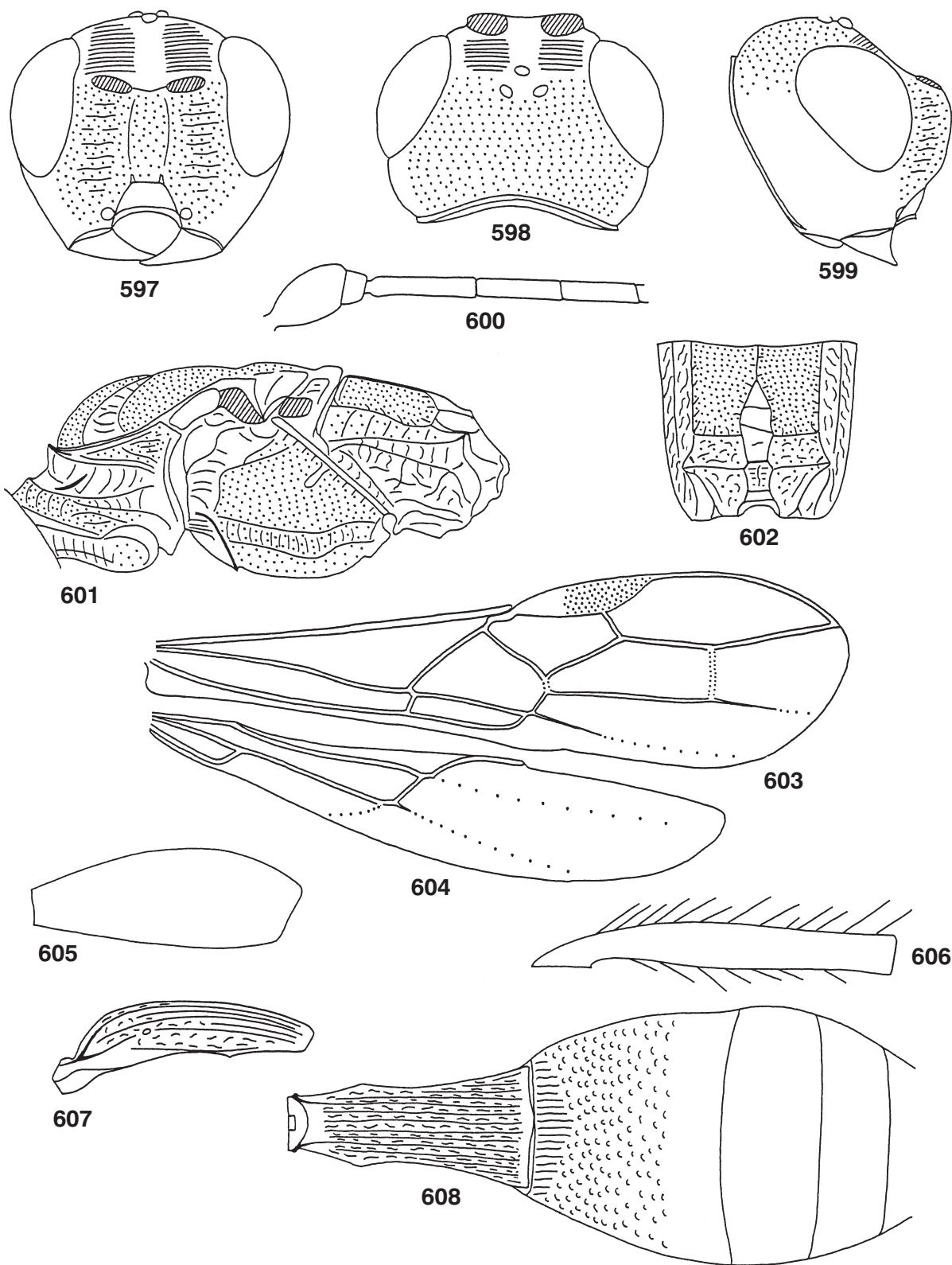
Spathius melleus Brues, 1918: 103; Nixon 1943: 440; Shenefelt and Marsh 1976: 1408.

Material. Holotype: female, "Rio, Br Solomon Is, W. M. Mann", "Type 9054" (red), "*Spathius melleus* Brues" (handwriting by Brues), "MCZ. Museum of comparative Zoology" (MCZC).

Description. Female. Body length 3.0 mm; fore wing length 2.0 mm. Head not depressed, its width 1.5 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye twice length of temple. Ocelli small, in triangle with base 1.15 times its sides; POL 1.4 times Od, 0.5 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4 times eye height and 0.9 times basal width of mandible. Face width equal to eye height and 1.2 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.7 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally.

Antennae filiform, slender, more than 22-segmented (apical segments missing). First flagellar segment 4.7 times as long as its apical width, 1.2 times as long as second segment. Subapical segments about 3.5 times as long as wide.

Mesosoma not depressed. Length of mesosoma 2.2 times its height. Pronotal keel distinct, its posterior branch widely fused with posterior part of pronotum, anterior branch situated submedially. Pronotum anteriorly with high subapical strong carina. Pronotal lateral depression rather narrow, more or less marginate, with sparse crenulae, and smooth between it. Mesoscutum weakly and roundly raised above pronotum. Notauli deep, complete, coarsely and sparsely crenulate. Prescutellar depression rather short, deep, with 3 carinae, smooth, 0.4 times as long as scutellum. Scutellum almost flat. Subalar depression rather shallow, rather wide, coarsely crenulate. Sternauli rather deep, shallow in posterior $\frac{1}{3}$, S-shaped, weakly crenulate, running along entire length of lower part of mesopleura. Metanotum with distinct slender pointed tooth. Metapleural flange narrow. Propodeum with small, but distinct and pointed lateral tubercles.



Figures 597–608. *S. melleus*: (597) head, frontal view, (598) head, dorsal view, (599) head, lateral view, (600) 5 basal segments of antenna, (601) mesosoma, lateral view, (602) propodeum, (603) fore wing, (604) hind wing, (605) hind femur, (606) hind tibia, (607) petiole, lateral view, (608) 5 metasomal tergites, dorsal view.

Wings. Fore wing 3.5 times as long as wide. Pterostigma rather narrow. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.25 times as long as pterostigma. Second radial abscissa 3 times first abscissa and forming almost right angle with it, 0.8 times third abscissa, 1.2 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.0 times maximum width, 1.5 times length of brachial cell. Recurrent vein 3.5 times second abscissa of medial vein. Nervulus perpendicular to anal vein. Distance from nervulus to basal vein 0.3 times nervulus length. Parallel vein interstitial. Mediocubital vein very weakly curved toward anal vein. Hind wing 5.3 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein strongly antefurcal, straight, oblique, unsclerotized.

Legs. Fore tibia with numerous spines arranged almost in one row. Hind coxa medium size, possible with basoventral tooth (this place glued). Hind femur 2.8 times as long as wide. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.4 times as long as basitarsus, 0.8 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) almost straight ventrally, distinctly and regularly curved dorsally, distinctly thickened in basal 1/3; widened in apical 1/3 (dorsal view), with spiracular tubercles in basal 1/3. Length of petiole twice its apical width, 1.5 times length of propodeum; apical width 1.6 times width at level of spiracles. Second tergite with more or less distinctly and almost completely separated laterotergites. Second suture indistinct. Median length of second and third tergites combined 1.4 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.4 times as long as metasoma, 1.3 times as long as petiole, 0.6 times as long as mesosoma, 0.35 times as long as fore wing.

Sculpture and pubescence. Vertex finely granulate. Frons finely transversely striate, narrow smooth ventially. Temple very finely coriaceous, smooth in lower 1/3. Face finely transversely striate, with granulation between striae. Mesoscutum densely granulate, without carinae near notauli. Scutellum densely granulate. Mesopleura densely and entirely granulate. Propodeum entirely densely and rather finely granulate, with sparse rugae in posterior half; areas distinctly marginate; areola long and narrow, petiolate area short and distinctly separate; basal carina 0.6 times as long as fork of areola. Petiole coarsely rugulose-striate. Second tergite striate, granulate in posterior 1/3. Third tergite coriaceous in basal half. Rest of tergites smooth. Hind coxae densely granulate, densely striate dorsally. Hind femur finely granulate. Mesoscutum with long sparse semi-erect light hairs along notauli and laterally. Dorsal surface of

hind tibia with only long, rather sparse, semi-erect hairs, their length 1.0–1.2 times maximum width of tibia.

Colour. Body yellow or brownish yellow, mesosoma in posterior half and petiole darker. Antennae yellow, faintly darker toward apex. Palpi pale yellow. Legs yellow, paler basally. Ovipositor sheath brown. Fore wing hyaline, widely and faintly darker along basal vein and below pterostigma. Pterostigma brown, yellow in basal 1/3.

Discussion. This species is possibly best placed in the *S. philotas* Nixon group, otherwise with only a single species, but its group position is rather problematical. The differences between *S. melleus* Brues and *S. philotas* Nixon (Philippines) (Nixon 1943: page 339) are the following:

- 1. Mesoscutum gradually raised above pronotum and covered only by long and sparse hairs. Mesopleura entirely granulate. Parallel vein interstitial. Second radial abscissa distinctly longer than first radiomedial vein *S. melleus* Brues
- Mesoscutum almost perpendicularly raised above pronotum and covered by dense short recumbent and long erect hairs. Mesopleura entirely rugulose. Parallel vein not interstitial. Second radial abscissa almost as long as first radiomedial vein *S. philotas* Nixon

This species might be included in the *S. exarator* (Linnaeus) group, but differs from all species of that group in its interstitial nervulus, its entirely granulate mesopleura, its propodeum with distinct tubercles, and its finely granulate vertex.

Distribution. Solomon Islands.

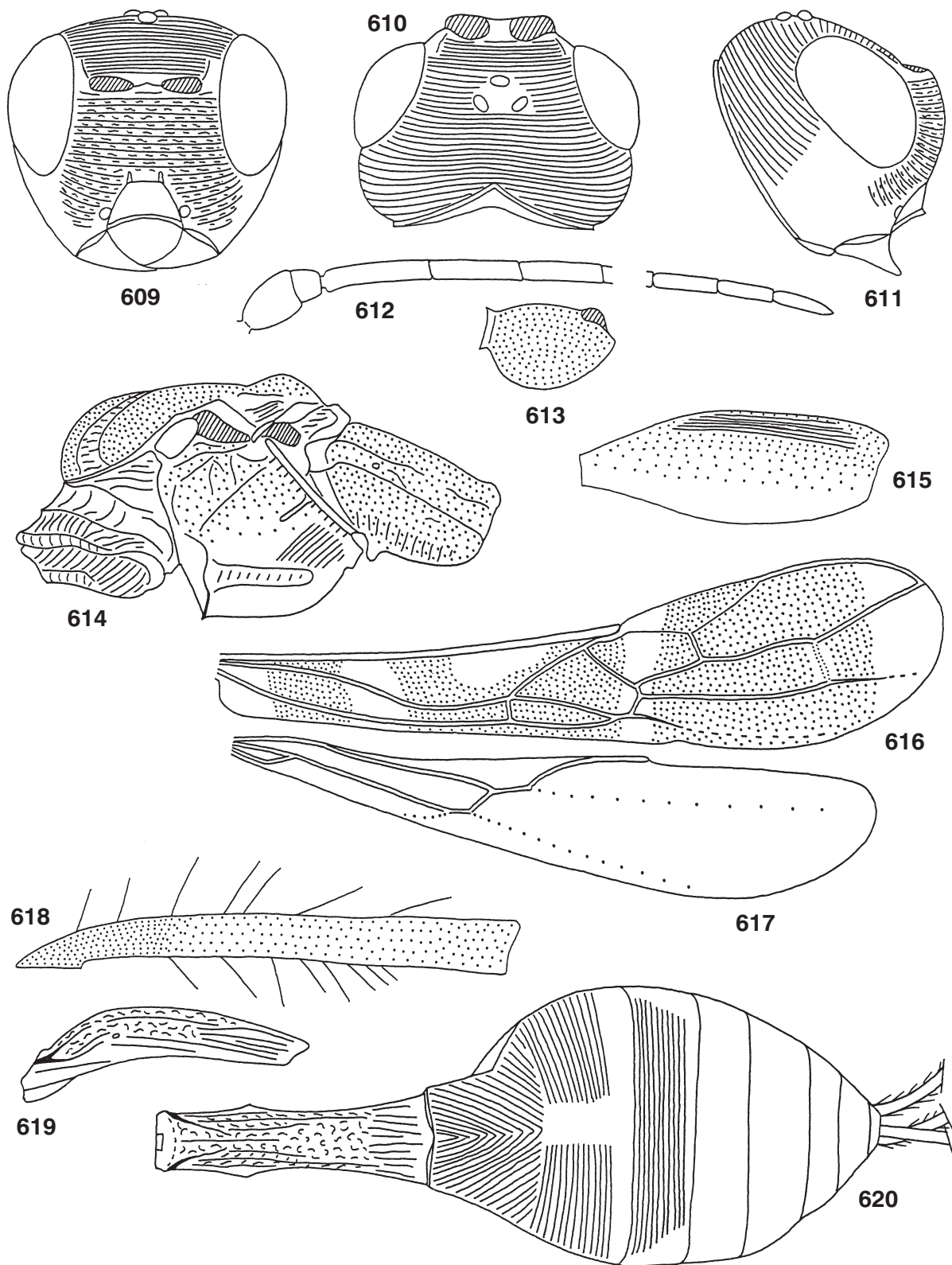
Group of *Spathius piperis* Wilkinson

***Spathius philippinensis* Ashmead, 1904**
(Figs 609–620)

Spathius philippinensis Ashmead, 1904: 148; Nixon 1943: 442; Shenefelt and Marsh 1976: 1412.

Material. Holotype: female, “Manila, PI”, “W A Stanton Collector”, “female, Type No 8010 U.S.N.M.” (red), “*Spathius philippinensis* Ashm. ♀” (handwriting by Ashmead) (USNM).

Description. Female. Body length 2.8 mm; fore wing length 2.1 mm. Head not depressed, its width 1.4 times median length. Head behind eyes weakly convex anteriorly, roundly narrowed in posterior 2/3. Transverse diameter of eye 1.5 times length of temple. Ocelli small, in almost equilateral triangle; POL 1.2 times Od, 0.4 times OOL. Eye glabrous, 1.4 times as high as broad. Malar space height 0.5 times eye height and almost equal to basal width of mandible. Face width 0.9 times as long as eye height and equal to height of face and clypeus combined. Clypeal suture distinct laterally, almost absent upper. Hypoclypeal depression medium size and round, its width 0.8 times dis-



Figures 609–620. *S. philippinensis*: (609) head, frontal view, (610) head, dorsal view, (611) head, lateral view, (612) basal and apical segments of antenna, (613) hind coxa, (614) mesosoma, lateral view, (615) hind femur, (616) fore wing, (617) hind wing, (618) hind tibia, (619) petiole, lateral view, (620) metasoma, dorsal view.

tance from edge of depression to eye, 0.45 times width of face. Occipital carina near mandible fused with hypostomal carina, complete dorsally.

Antennae filiform, slender, 27-segmented, 1.2 times as long as body. Scape 1.7 times as long as wide. First flagellar segment almost 5 times as long as its apical width, 1.2 times as long as second segment. Penultimate segment 4.0 times as long as wide, 0.55 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically.

Mesosoma. Length of mesosoma 1.8 times its height. Pronotal keel rather distinct, with one branch; the latter distinctly separated from margin of pronotum and situated in posterior $\frac{1}{3}$ of pronotum. Pronotal lateral depression not marginated, indistinct, finely sculptured, without crenulation. Mesoscutum highly and roundly raised above pronotum. Notauli deep, complete, rather wide, crenulate. Prescutellar depression long, deep, with 5 carinae, finely rugulose, 0.3 times as long as scutellum. Scutellum convex. Subalar depression very shallow, coriaceous, with two transverse carinae posteriorly. Sternauli shallow, straight, very finely striate, running along $\frac{2}{3}$ of lower part of mesopleura. Metanotum with small wide obtuse tooth. Metapleural flange slender and rather short. Propodeum without lateral tubercles.

Wings. Fore wing 3.7 times as long as wide. Radial vein arising distinctly before middle of pterostigma. Radial cell not shortened; metacarpus 1.2 times as long as pterostigma. Second radial abscissa 3.7 times first abscissa and forming almost right angle with it, equal to third abscissa, 1.8 times first radiomedial vein. Second radiomedial cell widened distally, its length 4.0 times maximum width, 1.5 times length of brachial cell. Recurrent vein 2.5 times second abscissa of medial vein. Nervulus weakly antefurcal, almost perpendicular to anal vein. Parallel vein interstitial. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 5.3 times as long as wide. First costal abscissa 0.6 times second abscissa. First abscissa of mediocubital vein almost 0.3 times second abscissa. Recurrent vein distinctly antefurcal and strongly curved toward base of wing.

Legs. Hind coxa small (its length 1.3 times maximum width), without basoventral tooth and corner. Hind femur 2.8 times as long as wide. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.45 times as long as basitarsus, as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) distinctly and irregularly curved (especially dorsally), distinctly thickened in basal $\frac{1}{3}$; weakly widened on level of spiracles and in apical $\frac{1}{6}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{4}$. Length of petiole 3.3 times its apical width, 1.5 times length of propodeum; apical width 1.3 times width at level of spiracles. Second tergite without separate laterotergites. Second suture distinct. Median length of

second and third tergites combined 2.2 times basal width of second tergite, 0.7 times their maximum width. Ovipositor straight. Ovipositor sheath 0.6 times as long as metasoma, 1.4 times as long as petiole, 0.8 times as long as mesosoma, 0.4 times as long as fore wing.

Sculpture and pubescence. Vertex densely and finely transversely striate, curved medially. Frons finely striate. Temple finely vertically striate in upper half, smooth in lower half. Face coarsely transversely striate, with microsculpture between striae. Mesoscutum densely and finely granulate, narrowly rugulose in medioposterior $\frac{1}{3}$, without rugae near sternauli and laterally. Scutellum densely and finely granulate. Mesopleura finely or very finely striate, smooth in anteroventral $\frac{1}{3}$. Metapleura densely and weakly rugulose. Propodeum with very finely marginated areas, densely reticulate-granulate, almost smooth in posterior $\frac{1}{2}$; areola long and narrow, petiolate area not separated; basal carina long, about twice as long as fork of areola. Hind coxa densely granulate. Hind femur finely striate-granulate in dorsal half. Petiole striate-rugulose, only striate in apical $\frac{1}{6}$. Second and third tergites very finely and concentrically aciculate, aciculae partly interrupted; fourth tergite very finely, sometimes almost indistinctly aciculate. Rest of tergites smooth. Mesoscutum with sparse, semi-erect, rather short hairs along notauli and laterally. Hairs of dorsal surface of hind tibia sparse, long, almost erect, their length almost equal to maximum width of tibia.

Colour. Head light reddish brown. Mesosoma and metasoma reddish brown, petiole apically and second tergite in basal half brownish yellow. Antennae yellow, darkened in apical half. Palpi dark reddish brown. Fore and middle coxae brownish yellow, all tarsi (except dark all fifth segments) yellow, all femora light reddish brown, all tibiae reddish brown. Ovipositor sheath yellow in basal $\frac{2}{3}$, black in apical $\frac{1}{3}$. Fore wing infuscate with wide and narrow hyaline stripes in several places. Pterostigma black, pale yellow in basal $\frac{1}{6}$.

Discussion. The position of *S. philippinensis* Ashmead in the species groups is not finally resolved. This species might be included in the *S. piperis* Wilkinson group and differs from *S. piperis* Wilkinson (Nixon 1943: page 397) by the following characters:

1. Second tergite very finely and almost concentrically aciculate, aciculae partly interrupted; third and fourth tergite finely, partly almost indistinctly transversely aciculate. Mesoscutum densely and finely granulate, without rugae near notauli and laterally. Propodeal areas finely marginate; areola obtuse anteriorly; basal carina long, about twice as long as fork of areola *S. philippinensis* Ashmead
- Second-fourth tergites finely longitudinally striate with fine rugosity between striae. Mesoscutum with much raised rugosity covered with fine granulation. Propodeal areas distinctly marginate; areola pointed anteriorly; basal carina short, about as long as fork of areola *S. piperis* Wilkinson

S. philippinensis Ashmead differs from *S. voltur* Nixon (Nixon 1943: page 313) in the *S. voltur* Nixon group by the following characters:

1. Mediocubital vein distinctly curved to anal vein in distal half. Parallel vein interstitial. Second radiomedial cell widened distally. Fore wing maculate. Vertex densely striate. Basal carina of propodeum long, about twice as long as fork of areola *S. philippinensis* Ashmead
- . Mediocubital vein not curved to anal vein in distal half. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ of distal margin of brachial cell. Second radiomedial cell not widened distally. Fore wing rather evenly infusate. Vertex completely smooth. Basal carina of propodeum short, almost as long as fork of areola *S. voltur* Nixon

In Nixon's key to the species groups this species can be run also to the *S. elaboratus* Wilkinson and *S. vesevus* Nixon groups (Nixon 1943: couplet 40, page 195). *S. philippinensis* Ashmead differs from all species of the *S. elaboratus* - group in its densely aciculate second and third tergites, its hind tibia entirely dark, its mediocubital vein of fore wing strongly curved in apical half, and its interstitial parallel vein. This species differs from both species of the *S. vesevus* - group in having its mesoscutum sparsely clothed by long hairs, the median lobe of mesoscutum without lateral shoulders, the propodeal areas indistinct, the mesopleura smooth, and the mediocubital vein strongly curved in distal half.

Distribution. Philippines.

Group of *Spathius ruficeps* (Smith)

Spathius honshuensis Belokobylskij, 1998
(Figs 621–632)

Spathius honshuensis Belokobylskij, 1998: 83.

Material. Holotype: female, "Japan: Aichi Pref, Mt. Sanage-yama, 9–15.V.1989, M.T., K. Takeno" (FAHN).

Description. Female. Body length 4.2 mm; fore wing length 3.1 mm. Head width 1.35 times its median length. Head behind eyes weakly convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye almost equal to length of temple. Ocelli small, in triangle with base 1.25 times its sides; POL 1.2 times Od, 0.4 times OOL. Eye glabrous, 1.4 times as high as broad. Malar space height 0.6 times eye height and 1.2 times basal width of mandible. Face width almost equal to eye height and height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.7 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina shortly absent near mandible, not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow. Vertex convex.

Antennae weakly thickened, filiform, 29-segmented, almost as long as body. Scape twice as long as wide.

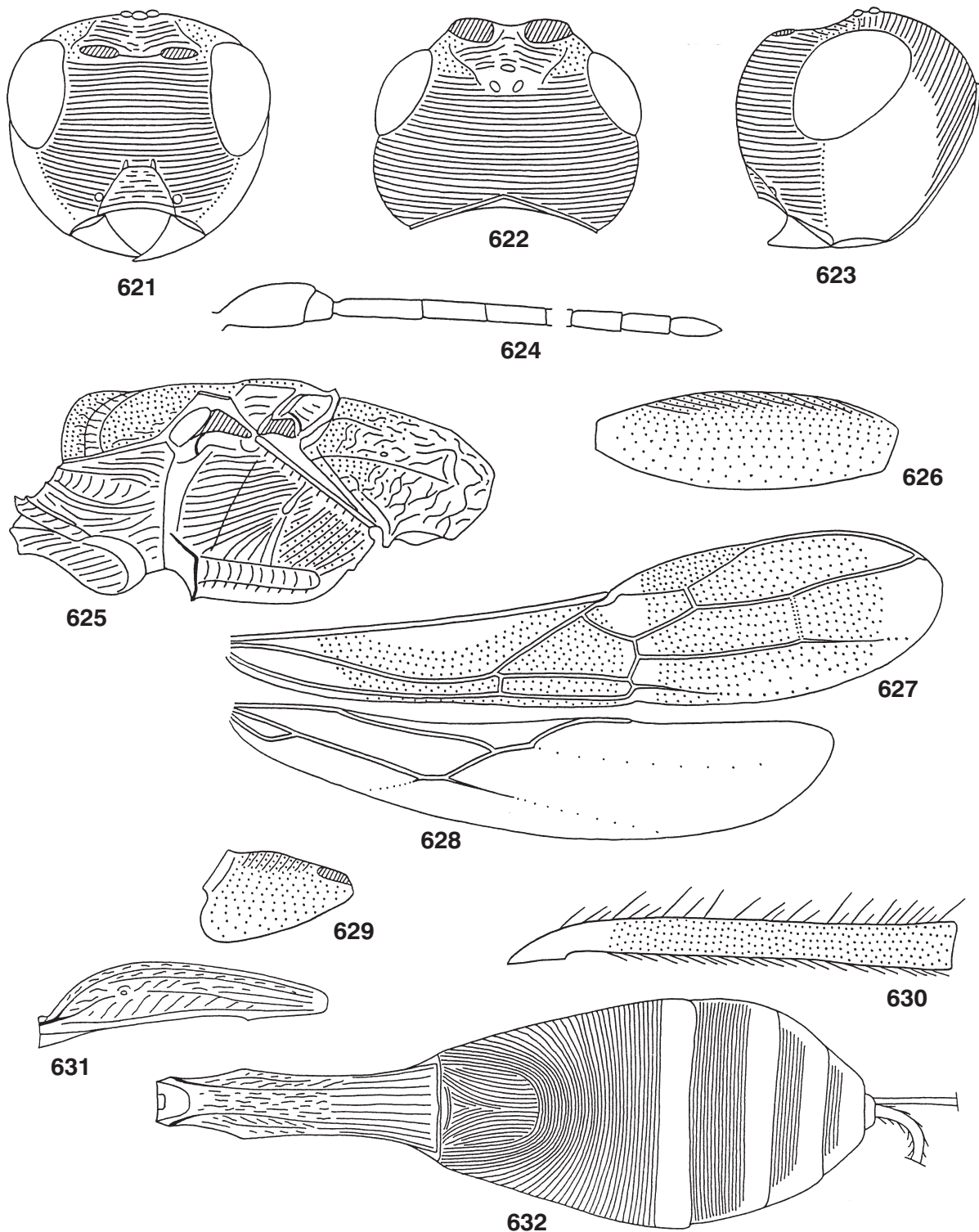
First flagellar segment 4.3 times as long as its apical width, 1.3 times as long as second segment. Penultimate segment 2.5 times as long as wide, 0.5 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically and without spine.

Mesosoma. Length of mesosoma about twice its height. Pronotal keel fine, its posterior branch very fine and not fused with posterior margin of pronotum, anterior branch situated near middle of pronotum. Pronotum subanteriorly with fine transverse carina. Pronotal lateral depression not marginate, shallow, rather narrow, rugose-crenulate. Mesoscutum highly and almost perpedicularly raised above pronotum. Notauli deep, rather narrow, complete, coarsely crenulate with granulation. Prescutellar depression shallow, rather short, with distinct 5 carinae, finely reticulate between striae, 0.3 times as long as scutellum. Scutellum weakly convex and with lateral carinae. Metanotum with short pointed dorsal tooth. Subalar depression wide, shallow, coarsely striate. Sternauli rather wide and deep, straight, crenulate, running along anterior $\frac{2}{3}$ of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and narrow. Propodeum with very small lateral tubercles.

Wings. Fore wing 4.0 times as long as wide. Pterostigma 3.5 times as long as maximum width. Radial vein arising almost from middle of pterostigma. Radial cell not shortened, metacarpus 1.3 times as long as pterostigma. Second radial abscissa 4.4 times first abscissa and forming weakly obtuse angle with it, 0.75 times the straight third abscissa, 1.5 times first radiomedial vein. Second radiomedial cell weakly widened distally, its length 3.3 times maximum width, 1.2 times length of brachial cell. Recurrent vein almost equal to second abscissa of medial vein. Distance from nervulus to basal vein 0.4 times nervulus length. Nervulus distinctly oblique toward base of wing. Parallel vein not interstitial, arising from anterior $\frac{1}{4}$ of distal margin of brachial cell. Mediocubital vein distinctly curved to anal vein in apical half. Hind wing 5.2 times as long as wide. First costal abscissa 0.7 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein rather long, very finely pigmented, distinctly antefurcal.

Legs. Fore tibia with dense, numerous, rather slender spines arranged in wide stripe. Hind coxa short (its length 1.5 times maximum width), without basoventral tooth, but with more or less distinct basoventral corner. Hind femur shortly elongate-oval, 2.7 times as long as wide. Hind tibia apically with 3 slender spines. Hind tarsus 0.8 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.4 times as long as basitarsus, 0.8 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) very weakly curved ventrally, dorsally distinctly curved in anterior half and almost straight in posterior half, thickened in basal $\frac{1}{4}$;



Figures 621–632. *S. honshuensis*: (621) head, frontal view, (622) head, dorsal view, (623) head, lateral view, (624) basal and apical segments of antenna, (625) mesosoma, lateral view, (626) hind femur, (627) fore wing, (628) hind wing, (629) hind coxa, (630) hind tibia, (631) petiole, lateral view, (632) metasoma, dorsal view.

weakly uniformly widened in apical $\frac{1}{6}$ (dorsal view), with weak spiracular tubercles in basal $\frac{1}{4}$. Length of petiole 3.2 times its apical width, 1.75 times length of propodeum; apical width 1.3 times width at level of spiracles. Second tergite with separated laterotergites. Second suture absent. Median length of second and third tergites combined 2.2 times basal width of second tergite, almost equal to their maximum width. Ovipositor almost straight. Ovipositor sheath as long as body, almost twice as long as metasoma, 2.7 times as long as mesosoma, 1.5 times as long as fore wing.

Sculpture and pubescence. Vertex densely coarsely transversely striate. Frons undulately transversely striate with rugulosity, densely granulate only laterally. Face very densely transversely striate with reticulation. Temple finely vertically striate in upper half, smooth in below half. Mesoscutum densely granulate, coarsely rugose with undulate striation on wide medioposterior area; lobes near notauli without distinct rugae. Scutellum finely granulate. Mesopleura coarsely and irregularly striate, with small smooth submedian area. Propodeum coarsely and densely rugose-reticulate, sparsely reticulate in posterior half; basolateral areas indistinctly marginate, areola rather small and wide, petiolate area short and distinctly separated from areola by high carina; basal carina 1.3 times as long as fork of areola. Hind coxa granulate, concentrically striate dorsally. Hind femur finely granulate-coriaceous, very finely coriaceous below. Petiole with numerous longitudinal striae and fine reticulation between striae. Second tergite finely and very densely longitudinally aciculate, third tergite very densely, semi-concentrically and finely aciculate. Fourth-sixth tergites almost entirely very densely and very finely aciculate. Mesoscutum with short, sparse and semi-erect hairs situated along notauli and marginally. Mesopleura bare of wide median area. Hairs of dorsal surface of hind tibia almost erect, rather sparse and long, their length 0.7–1.0 times maximum width of tibia.

Colour. Body reddish brown, mesosoma in small spots and metasoma behind petiole dark reddish brown, metasoma in apical half almost black. Antennae light brown, faintly darkened toward apex, 5 apical segments black. Palpi dark reddish brown. Legs light reddish brown or reddish brown, hind tibia darker, all tibiae basally yellow. Ovipositor sheath light reddish brown in basal $\frac{2}{3}$, almost black in apical $\frac{1}{3}$. Fore wing distinctly infusate, with hyaline spots and strips basally, medially and apically. Pterostigma dark brown, yellow in basal $\frac{1}{3}$.

Discussion. The position of *S. honshuensis* Belokobyl'skij in the species groups is quite problematical. Conventionally, I included this species in the *S. ruficeps* (Smith) group (Nixon 1943: page 373), but it is distinctly separated from all species of that group by its finely developed pronotal keel, almost perpendicularly raised mesoscutum, distinctly S-shaped mediocubital vein, and short second tarsal segment of hind leg

(basitarsus 2.5 times as long as second segment). Also, this species might be included in the *S. elaboratus* Wilkinson group, but it distinctly differs from all species of that group in the small number of apical spines of the hind tibia, the second and third tergites entirely and basal halves of fourth and fifth tergites distinctly and finely aciculate, the not interstitial position of the parallel vein of fore wing, the densely and coarsely striate mesopleura, and its very long ovipositor.

Distribution. Japan (Honshu).

Spathius manni Brues, 1918

(Figs 633–645)

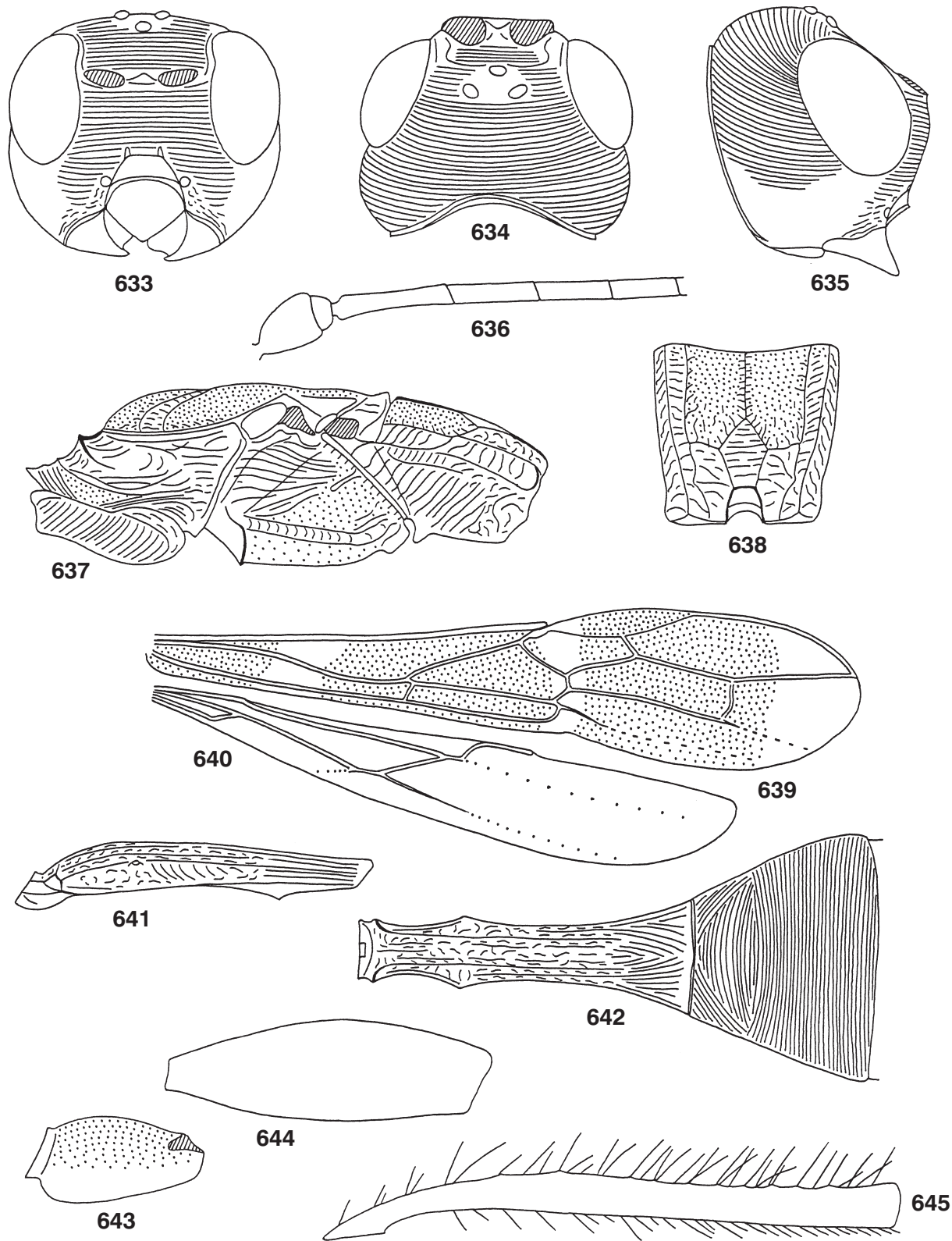
Spathius manni Brues, 1918: 102; Nixon 1943: 439; Shenefelt and Marsh 1976: 1408.

Material. Holotype: female, "Wai-ai, Br Solomon Is, W.M. Mann", "Type 9053" (red), "*Spathius manni* Brues (handwriting by Brues), MCZ. Museum of Comparative Zoology" (MCZC).

Description. Female. Body length 7.2 mm; fore wing length 4.5 mm. Head not depressed, its width 1.4 times median length. Head behind eyes convex in anterior half, roundly narrowed in posterior half. Transverse diameter of eye 1.2 times length of temple. Ocelli small, in triangle with base 1.3 times its sides; POL about twice Od, 0.65 times OOL. Eye glabrous, 1.4 times as high as broad. Malar space height 0.3 times eye height and 0.7 times basal width of mandible. Face width 0.8 times eye height and 1.2 times height of face and clypeus combined. Clypeal suture complete, fine dorsally. Hypoclypeal depression rather large and round, its width 1.1 times distance from edge of depression to eye, 0.6 times width of face. Occipital carina absent near mandible at short distance and not fused with hypostomal carina, complete dorsally.

Antennae slender, weakly setiform, more than 45-segmented (apical segments missing). First flagellar segment 5.8 times as long as its apical width, 1.3 times as long as second segment. Subapical segment about 5.0 times as long as wide.

Mesosoma weakly depressed, its length almost 3.0 times maximum height. Pronotal keel with single, very high, far separated from posterior part of pronotum branch. Pronotal lateral depression rather narrow, deep, marginate, smooth, with several sparse striae. Mesoscutum weakly and roundly raised above pronotum. Notauli wide, deep, complete, coarsely crenulate. Prescutellar depression long, rather deep, with 4 strong carinae, 0.4 times as long as scutellum. Scutellum flat. Sternauli rather deep, weakly S-shaped, crenulate, running along entire length of lower part of mesopleura. Subalar depression shallow, wide, densely and coarsely striate. Metanotum with small narrow tooth. Metapleural flange short and wide. Propodeum without lateral tubercles.



Figures 633–645. *S. manni*: (633) head, frontal view, (634) head, dorsal view, (635) head, lateral view, (636) 6 basal segments of antenna, (637) mesosoma, lateral view, (638) propodeum, (639) fore wing, (640) hind wing, (641) petiole, lateral view, (642) 3 first metasomal tergites, dorsal view, (643) hind coxa, (644) hind femur, (645) hind tibia.

Wings. Fore wing 4.5 times as long as wide. Pterostigma narrow. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.25 times as long as pterostigma. Second radial abscissa about 4.0 times first abscissa and forming weakly obtuse angle with it, 0.9 times third abscissa, 1.4 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.6 times maximum width, 1.1 times length of brachial cell. Recurrent vein twice as long as second medial abscissa. Nervulus weakly oblique towards base of wing. Distance from nervulus to basal vein 0.2 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{5}$ of distal margin of brachial cell. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 6.2 times as long as wide; distinctly narrow basally. First costal abscissa 0.45 times second abscissa. First abscissa of mediocubital vein 0.6 times second abscissa. Recurrent vein strongly antefurcal, short, and straight.

Legs. Fore tibia with several thick spines arranged in rather narrow stripe. Hind coxa medium size, elongate (its length 1.8 times maximum width), without distinct basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tibia outside apically with 8 slender spines on outer side, with very dense white hairs in several dense lines on inner side apically. Hind tarsus missing.

Metasoma. Petiole (lateral view) almost straight ventrally, convex dorsally, weakly thickened in basal $\frac{1}{5}$; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with small spiracular tubercles in basal $\frac{1}{5}$. Length of petiole 3.0 times its apical width, almost twice length of propodeum; apical width 1.7 times width at level of spiracles. Second tergite with partly separated laterotergites (suture present in anterior $\frac{1}{5}$ only). Second suture indistinct. Median length of second and third tergites combined 1.5 times basal width of second tergite, 0.75 times their maximum width. Ovipositor straight. Ovipositor sheath 0.6 times as long as metasoma, 1.3 times as long as petiole, 1.1 times as long as mesosoma, 0.6 times as long as fore wing.

Sculpture and pubescence. Vertex with dense transverse striation, without additional ground sculpture between striae. Frons very densely and finely striate. Temple semicircularly densely striate, almost smooth or finely coriaceous below. Face transversely striate, with dense microsculpture between striae. Propleura coarsely striate. Mesoscutum densely granulate, with fine and short rugae along notauli and laterally. Scutellum granulate. Mesopleura coarsely striate in upper half, finely coriaceous in lower half. Metapleura coarsely rugose, with fine granulation between rugae. Propodeum coarsely striate-rugose, densely granulate basolaterally; with distinctly marginate areas, basolateral areas large, areola small and pentagonal, petiolate area short and distinctly separate; basal carina long, 1.5 times as long as fork of areola. Hind coxa densely and distinctly

granulate. Hind femur coriaceous. Petiole densely rugulose, with striation laterally and apically. Second and third tergites entirely semicircularly and finely transversely aciculate; fourth-sixth tergites in apical halves finely transversely aciculate, almost smooth in basal half. Mesoscutum with sparse and semi-erect hairs along notauli and laterally. Hairs of dorsal surface of hind tibia rather dense, almost erect, only long, their length almost equal to maximum width of tibia.

Colour. Mesosoma and petiole black, head and rest metasomal tergites reddish brown. Antennae yellowish brown, darkened toward apex. Palpi reddish brown, 2 apical segments of maxillary palpi yellow. Tegula black. Legs reddish brown, fore coxa and all tarsi (except dark fifth segment) yellow; hind tibia entirely (including base) reddish brown. Ovipositor sheath white yellow in basal half, brown to dark brown in apical half. Fore wing distinctly infusate, with hyaline transverse stripes apically, near base of pterostigma and subbasally. Pterostigma brown, white in basal $\frac{1}{4}$.

Discussion. This species is in the *S. ruficeps* (Smith) group. *S. manni* Brues is very closely similar to *S. apicalis* Westwood (Nixon 1943: couplet 4, page 374) and quite possibly is only an insular form of *S. apicalis*. The differences between these species are indicated in the following key:

- 4a. Ovipositor sheaths shorter, 0.6 times as long as metasoma. Mesosoma rather distinctly depressed. Middle coxa reddish brown. Petiole twice as long as propodeum *S. manni* Brues
 - Ovipositor sheaths longer, a little longer than metasoma. Mesosoma almost not depressed. Middle coxa whitish or yellowish. Petiole less than twice as long as propodeum *S. apicalis* Westwood

Distribution. Solomon Is.

Spathius pilosus Szépligeti, 1910
(Figs 646-657)

Spathius pilosus Szépligeti, 1910: 86; Nixon 1943: 443; Shenefelt and Marsh 1976: 1413.

Material. Holotype: female, "Indonesia, Java, Batavia, XII 1907, Jacobson", "E. Jacobson, Batavia, Dec. 07 (29.08).", "Holotypus ♀ *Spathius pilosus* Szépl. 1910" (below: "des. Papp J."), "Hym. Typ. No 1585, Mus. Budapest", "*Spathius pilosus* m." (handwriting by Szépligeti) (HNHM).

Description. Female. Body length 5.1 mm; fore wing length 3.5 mm. Head not depressed, its width 1.5 times median length. Head behind eyes weakly convex anteriorly and roundly narrowed posteriorly. Transverse diameter of eye 1.4 times length of temple. Ocelli rather small, in triangle with base 1.3 times its sides; POL 1.25 times Od, 0.4 times OOL. Eye glabrous, 1.2 times as high as

broad. Malar space height 0.45 times eye height and 0.8 times basal width of mandible. Face width 0.9 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression rather small and round, its width 0.7 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina absent near mandible and not fused with hypostomal carina, complete dorsally. Hypostomal flange narrow.

Antennae missing, present only scape and pedicel.

Mesosoma. Length of mesosoma 2.25 times its height. Pronotal keel very distinct, its posterior branch high, very closely situated to posterior margin of pronotum, but not fused; anterior branch fine, situated near middle of pronotum. Pronotal lateral depression shallow, rather narrow, partly marginate, crenulate. Pronotum subanteriorly with distinct transverse carina. Mesoscutum rather gently and roundly raised above pronotum. Notauli deep, wide, complete, coarsely and densely crenulate. Prescutellar depression deep, wide, with 5 costae, smooth between costae, 0.35 times as long as scutellum. Scutellum convex. Subalar depression shallow, wide, coarsely and densely striate. Sternauli rather shallow, narrow, straight, finely crenulate, running along anterior half of lower part of mesopleura. Postpectal carina absent. Metapleural flange rather long and wide. Propodeum without lateral tubercles.

Wings. Fore wing 4.5 times as long as wide. Pterostigma about 5.0 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.2 times as long as pterostigma. Second radial abscissa 3.5 times first abscissa and forming distinct angle with it, 0.8 times third abscissa, 1.4 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 4.0 times maximum width, 1.2 times length of brachial cell. Recurrent vein 1.6 times second abscissa of medial vein. Nervulus almost perpendicular to anal vein. Distance from nervulus to basal vein 0.4 times nervulus length. Parallel vein interstitial. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 6.0 times as long as wide. First costal abscissa 0.4 times second abscissa. First abscissa of mediocubital vein almost half second abscissa. Recurrent vein unscerotized, oblique, straight, strongly antefurcal.

Legs. Fore tibia with rather sparse, strong spines, arranged in wide stripe. Hind coxa rather small (its length 1.8 times maximum width), without basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tibia apically with 7 spines on outer margin, with 3 rows of very dense silver hairs on inner side apically. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.6 times as long as basitarsus, 1.5 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) ventrally curved more or less regularly, dorsally distinctly and regularly curved

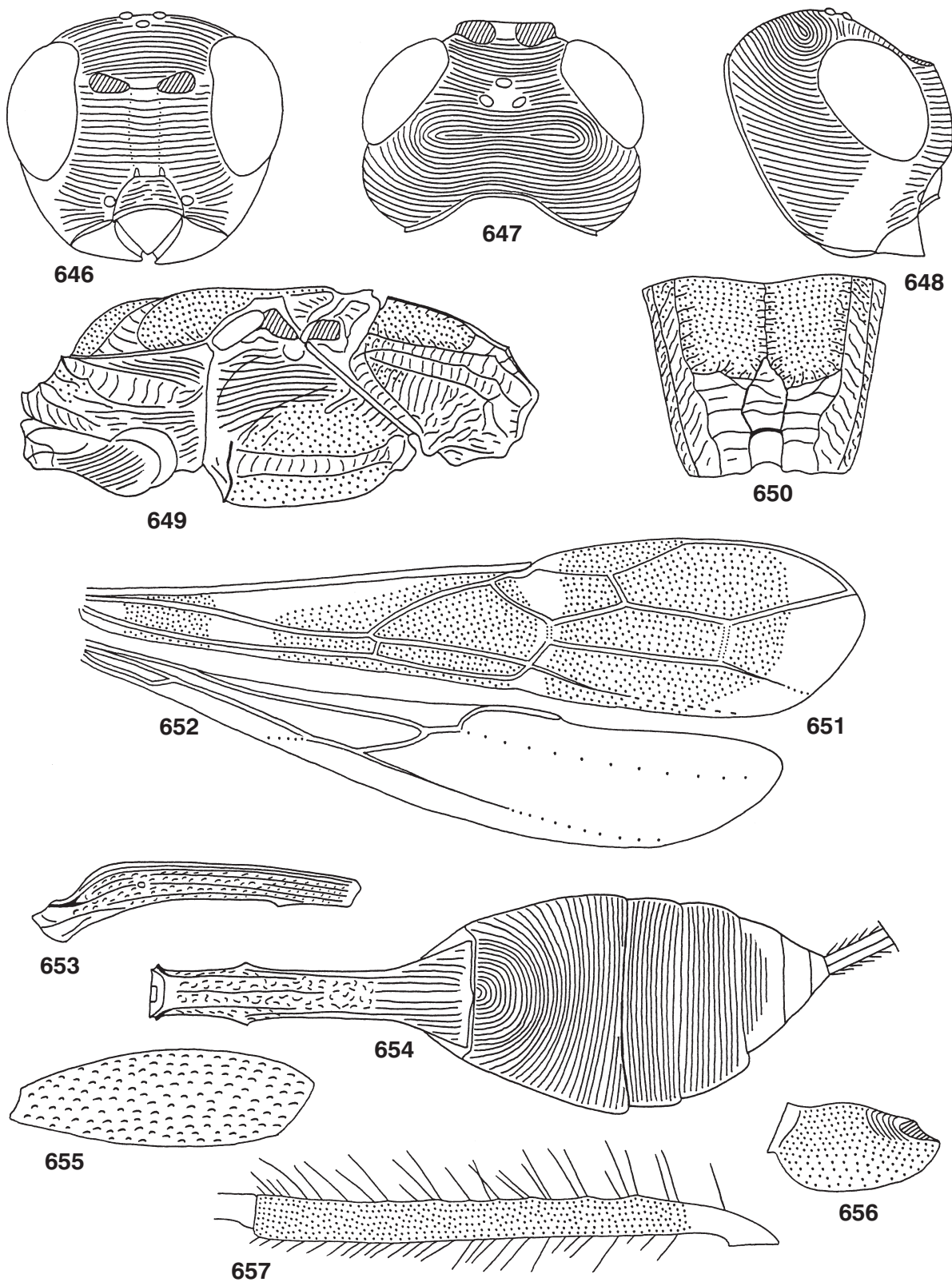
in anterior $\frac{1}{4}$, straight in posterior $\frac{3}{4}$; distinctly thickened in basal $\frac{1}{4}$; distinctly widened in apical $\frac{1}{4}$ (dorsal view), with spiracular tubercles in basal $\frac{1}{4}$. Length of petiole 3.0 times its apical width, 2.3 times length of propodeum; apical width 1.8 times width at level of spiracles. Second tergite without separate laterotergites. Second suture indistinct. Median length of second and third tergites combined equal to basal width of second tergite, 0.6 times their maximum width. Ovipositor straight. Ovipositor sheath 1.4 times as long as metasoma, 2.8 times as long as petiole, almost twice as long as mesosoma, almost as long as fore wing, 0.7 times as long as body.

Sculpture and pubescence. Vertex and frons densely regularly linearly or curvedly striate and without rugosity, striae at middle of vertex oval; temple semicircularly striate, almost smooth below. Face coarsely transversely undulately striate. Mesoscutum densely and finely granulate-coriaceous, with fine striation partly, with rather fine and short striae along notauli. Scutellum densely finely granulate-coriaceous. Mesopleura densely curvedly striate in upper $\frac{1}{3}$, sparsely striate on rest part, with fine granulation posteriorly and below sternauli. Metapleura densely vertically striate. Propodeum with rather finely marginate areas, basolateral areas densely coriaceous, striate posteriorly; areola short, rather narrow, sparsely transversely striate; petiolate area narrow and distinctly separated from areola; rest of propodeum sparsely and coarsely rugose-striate; basal carina about twice as long as fork of areola. Hind coxa densely striate dorsally, densely distinctly granulate on other part. Hind femur almost entirely finely coriaceous. Petiole densely rugulose-reticulate, with distinct striae laterally, finely striate apically. Second tergite with very dense fine semicircular aciculation; third-sixth tergite densely transversely aciculate. Mesonotum with sparse almost erect long hairs along notauli and marginally. Hairs of dorsal surface of hind tibia long, rather dense, almost erect, their length 1.2–1.3 times maximum width of tibia.

Colour. Head reddish-yellow. Mesosoma and metasoma brownish red, mesonotum and side of metasoma darker. Two basal segments of antennae yellow. Palpi pale yellow. Fore and middle coxae and trochanters of all legs whitish-yellow, rest parts of legs reddish brown, bases of all segments of all tarsi paler; hind tibia faintly paler basally. Ovipositor sheath brownish yellow, dark brown apically. Fore wing infusate, with subhyaline stripes apically, under base of pterostigma, before curving place of mediocubital vein and in base. Pterostigma brown, yellow in basal $\frac{1}{4}$.

Discussion. This species is in the *S. ruficeps* (Smith) group. *S. pilosus* Szépligeti is closely similar to *S. apicalis* Westwood (Nixon 1943: couplet 4, page 374); their differences are indicated in the following key:

4a. Palpi pale yellow entirely. Vertex and frons without rugosity between striae. Petiole longer, 2.3 times as long as



Figures 646–657. *S. pilosus*: (646) head, frontal view, (647) head, dorsal view, (648) head, lateral view, (649) mesosoma, lateral view, (650) propodeum, (651) fore wing, (652) hind wing, (653) petiole, lateral view, (654) metasoma, dorsal view, (655) hind femur, (656) hind coxa, (657) hind tibia.

propodeum. Second-sixth tergites distinctly aciculate. Ovipositor sheath longer, 1.4 times as long as metasoma. Prepectal carina situated very closely to posterior margin of pronotum *S. pilosus* Szépligeti

–. Palpi darkened, but 1–2 apical segments of maxillary palpi pale. Vertex and frons with rugosity or granulation between striae. Petiole shorter, less than twice as long as propodeum. Second-sixth tergites partly indistinctly aciculate with rugosity. Ovipositor sheath shorter, slightly longer than metasoma. Prepectal carina situated far from posterior margin of pronotum *S. apicalis* Westwood

S. pilosus Szépligeti is also similar to *S. manni* Brues and differs by the same characters as *S. apicalis* Westwood except for the sculpture of vertex and metasoma.

Distribution. Indonesia (Java)

Spathius taiwanicus Belokobylskij, 1996

Spathius taiwanicus Belokobylskij, 1996a: 188 (description, figures).

Material. Holotype, female, China, "Taiwan, Wushe, 1150 m, 22.V.1983, H. Townes" (AEIG).

Discussion. A detailed description of this species in the *S. ruficeps* (Smith) group was given in Belokobylskij (1996a: 188–190). This species is similar to *S. chryso-gonus* Nixon (Borneo) (Nixon 1943: couplet 6, page 374), and differences between these species are shown in the following key:

- 6a. Vertex entirely smooth. Mesopleura entirely and rather finely rugulose-reticulate. Metasomal aciculation very fine. Ovipositor sheath shorter, nearly as long as propodeum and metasoma combined *S. taiwanicus* Belokobylskij
- . Vertex finely striate in posterior ¼, almost smooth on other part. Mesopleura almost smooth at most part. Metasomal aciculation distinct. Ovipositor sheath longer, nearly as long as mesosoma and metasoma combined *S. chryso-gonus* Nixon

Distribution. China (Taiwan).

Spathius trichiosomus Cameron
(Figs 658–669)

Spathius trichiosomus Cameron, 1910: 45; Nixon 1943: 446; Shenefelt and Marsh 1976: 1421.

Material. Holotype: female, "Ceylon, Nietner", "*Spathius trichiosomus* Cam. type. Ceylon", "11608", "Zool. Mus. Berlin" (MNHU).

Description. Female. Body length 10.0 mm; fore wing length 6.4 mm. Head not depressed, its width 1.5 times median length. Head behind eyes convex anteriorly, roundly narrowed posteriorly. Transverse diameter of eye 1.2 times length of temple. Occiput strongly concave. Ocelli small, in triangle with base 1.2 times its sides; POL 1.25 times Od, 0.45 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.4 times

eye height and 0.7 times basal width of mandible. Face width 0.9 times eye height and slightly large than height of face and clypeus combined. Clypeal suture complete and distinct. Hypoclypeal depression oval, its width slightly less than distance from edge of depression to eye. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete dorsally.

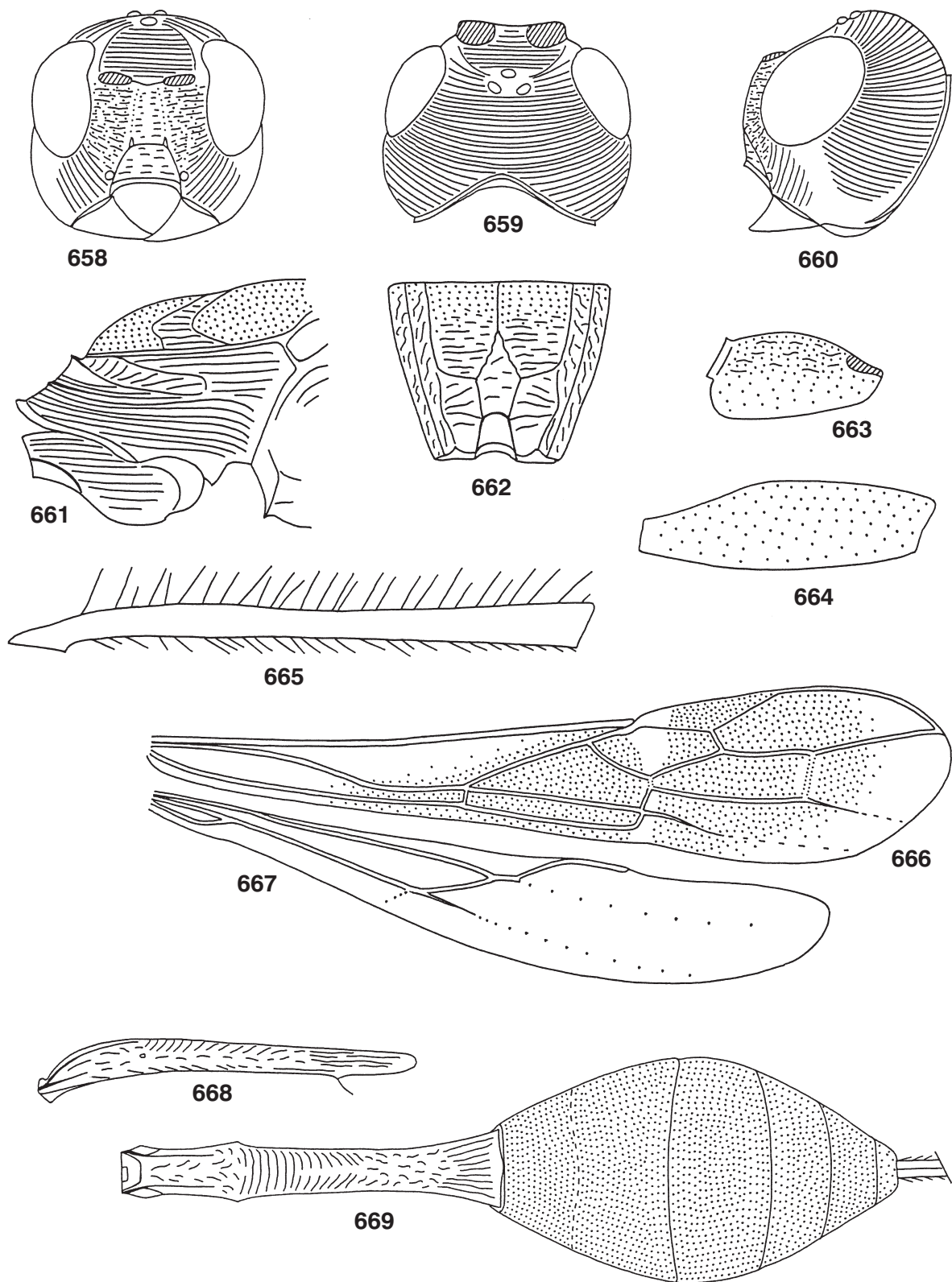
Antenna missing, present scape and pedicel only. Scape 1.5 times as long as wide.

Mesosoma weakly depressed. Length of mesosoma 2.5 times its height. Pronotal keel very high (especially laterally), posterior branch situated rather closely to posterior margin of pronotum, but not fused with it; anterior branch fine and situated submedially. Pronotal lateral depression rather shallow, narrow, marginate, crenulate. Mesoscutum weakly and gradually raised above pronotum. Median lobe of mesoscutum with distinct longitudinal sculptured furrow. Notauli deep, wide, complete, crenulate. Prescutellar depression deep, sparsely rugulose, with 3 carinae, almost 0.5 times as long as scutellum. Scutellum convex, without lateral carinae. Subalar depression shallow, wide, longitudinally striate. Sternauli shallow, but deeper posteriorly, straight, crenulate, running along anterior ⅓ of lower part of mesopleura. Postpectal carina absent. Propodeum without lateral tubercles.

Wings. Fore wing 4.5 times as long as wide. Radial vein arising from middle of pterostigma. Radial cell not shortened; metacarpus 1.25 times as long as pterostigma. Second radial abscissa 3.3 times first abscissa and forming distinct obtuse angle with it, 0.6 times third abscissa, 1.1 times first radiomedial vein. Length of second radiomedial cell 3.3 times maximum width, slightly less than length of wide brachial cell. Recurrent vein 4.5 times second abscissa of medial vein. Nervulus almost interstitial. Parallel vein almost interstitial. Mediocubital vein distinctly curved to anal vein in distal half. Hind wing 6.0 times as long as wide. First abscissa of mediocubital vein 0.4 times as long as second abscissa. Recurrent vein unsclerotized, oblique, short, interstitial.

Legs. Fore tibia with numerous and rather disperse spines arranged in narrow stripe. Hind coxa rather small (its length 1.8 times maximum width), without basoventral tooth and corner. Hind femur 3.5 times as long as wide. Hind tarsus 0.85 times as long as hind tibia. Hind basitarsus 0.7 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.7 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) straight ventrally and dorsally, weakly thickened in basal ⅓; distinctly widened in apical ⅓, with distinct spiracular tubercles in basal ⅓. Length of petiole 5.0 times its apical width, 2.7 times length of propodeum. Second tergite with separated laterotergites. Second suture very fine. Median length of second and third tergites combined almost twice basal width of second tergite, 0.8 times their maximum width. Fourth tergite rather distinctly largened, 0.7 times as



Figures 658–669. *S. trichiosomus*: (658) head, frontal view, (659) head, dorsal view, (660) head, lateral view, (661) anterior part of mesosoma, lateral view, (662) propodeum, (663) hind coxa, (664) hind femur, (665) hind tibia, (666) fore wing, (667) hind wing, (668) petiole, lateral view, (669) metasoma, dorsal view.

long as second and third tergites combined, 1.5 times as long as fifth tergite. Ovipositor brocked (from original description, ovipositor sheath 0.8 times as long as body).

Sculpture and pubescence. Vertex and frons with distinct dense and almost linear transverse striation. Face rugose-granulate, with dense curved striae on malar space. Temple at most part semiconcentrically densely striate, smooth below. Mesoscutum finely and densely granulate, lateral lobes with striation, with long striae along notauli. Mesopleura longitudinally striate almost entirely. Metapleura entirely reticulate-rugose with granulation. additionally with dense rugulosity in posterior half. Propodeum densely rugose-reticulate at most part, rugulose anteriorly, granulate basally; with distinctly marginate areas; areola rather small, petiolate area separated; basal carina 1.3 times as long as fork of areola. Hind coxa densely coriaceous, concentrically striate dorsally. Hind femur finely coriaceous. Petiole rather finely striate, with dense and transverse rugae medially. Rest of tergites entirely and very densely granulate (including its lateral parts). Mesoscutum with sparse, long, semi-erect hairs arranged along notauli and marginally. Hairs on dorsal surface of hind tibia long, rather sparse, erect, their length almost equal to maximum width of tibia.

Colour. Head and metasoma (without petiole) dark reddish brown; mesosoma and petiole light brown. Scape yellowish brown. Palpi dark reddish brown, paler distally. Coxae, trochanters, trochantelli and femora dark reddish brown, tibiae light brown, tarsi yellow or pale yellow. Fore wing hyaline, with wide brownish stripes on level of basal vein and under pterostigma. Pterostigma brown, pale yellow in basal $\frac{1}{4}$.

Discussion. This species is in the *S. ruficeps* (Smith) group. *S. trichiosomus* Cameron is closely similar to *S. femoralis* Westwood (Nixon 1943: couplet 7, page 374); their differences are shown in the following key:

- 7a. Ovipositor sheath distinctly longer than metasoma. Petiole longer; 2.7 times as long as propodeum. Second tergite without rugosity; entirely granulate. Propodeum densely rugose-reticulate with granulation. Hind tibia entirely light brown
 *S. trichiosomus* Cameron
 –. Ovipositor sheath almost as long as metasoma. Petiole shorter; less than twice as long as propodeum. Second tergite aciculate of finely rugulose. Propodeum reticulate-rugose in basolateral areas, finely granulate-reticulate on other part. Hind tibia brown, pale basally *S. femoralis* Westwood

Distribution. Sri Lanka.

Group of *Spathius rusticulus* Wilkinson

Spathius mimeticus (Enderlein, 1912)

Stenophasmus mimeticus Enderlein, 1912: 11.

Spathius mimeticus: Nixon 1943: 449; Shenefelt and Marsh 1976: 1408; Belokobylskij 1996a: 183 (redescription, figures).

Material. Lectotype (Belokobylskij, 1996a: 183): female, "Formosa, Takao, H. Sauter S., 20.IV.[19]07", "Type" (red), "*Stenophasmus mimeticus* Enderl. ♀ Type, Dr. Enderlein det. 1912", "Mus. Zool. Polonicum, Warszawa 12/45" (MIZW).

Paralectotype: 1 male, "Formosa, Takao, H. Sauter S., 13.I.[19]07", "Co-Type" (yellow), "*Stenophasmus mimeticus* Enderl. ♂, Type, Dr. Enderlein det. 1912" (MIZW).

Discussion. A detailed redescription of this species in the *S. rusticulus* Wilkinson group was given by Belokobylskij (1996a: 183–184). This species is similar to *S. rhianus* Nixon (Philippines) (Nixon 1943: couplet 6, page 352) because of its metanotum without a tooth and its propodeum without areola; differences between these species are given in the following key:

- 6a. Mesoscutum highly raised above pronotum and without striae posteriorly. Scutellum distinctly convex. Mesopleura densely granulate at most part. Second and third tergites very densely and finely granulate. Vertex distinctly and entirely aciculate. Propodeum coarsely sculptured
 *S. mimeticus* (Enderlein)
 –. Mesoscutum not highly raised above pronotum and with striae posteriorly. Scutellum weakly convex. Mesopleura almost smooth at most part. Second and third tergites with roughly semicircular basal area, outside area finely aciculate-rugulose. Vertex finely aciculate anteriorly, almost absent in posterior half. Propodeum very finely reticulate with more or less distinct granulation *S. rhianus* Nixon

Distribution. China (Taiwan).

Group of *Spathius testaceitarsis* Cameron

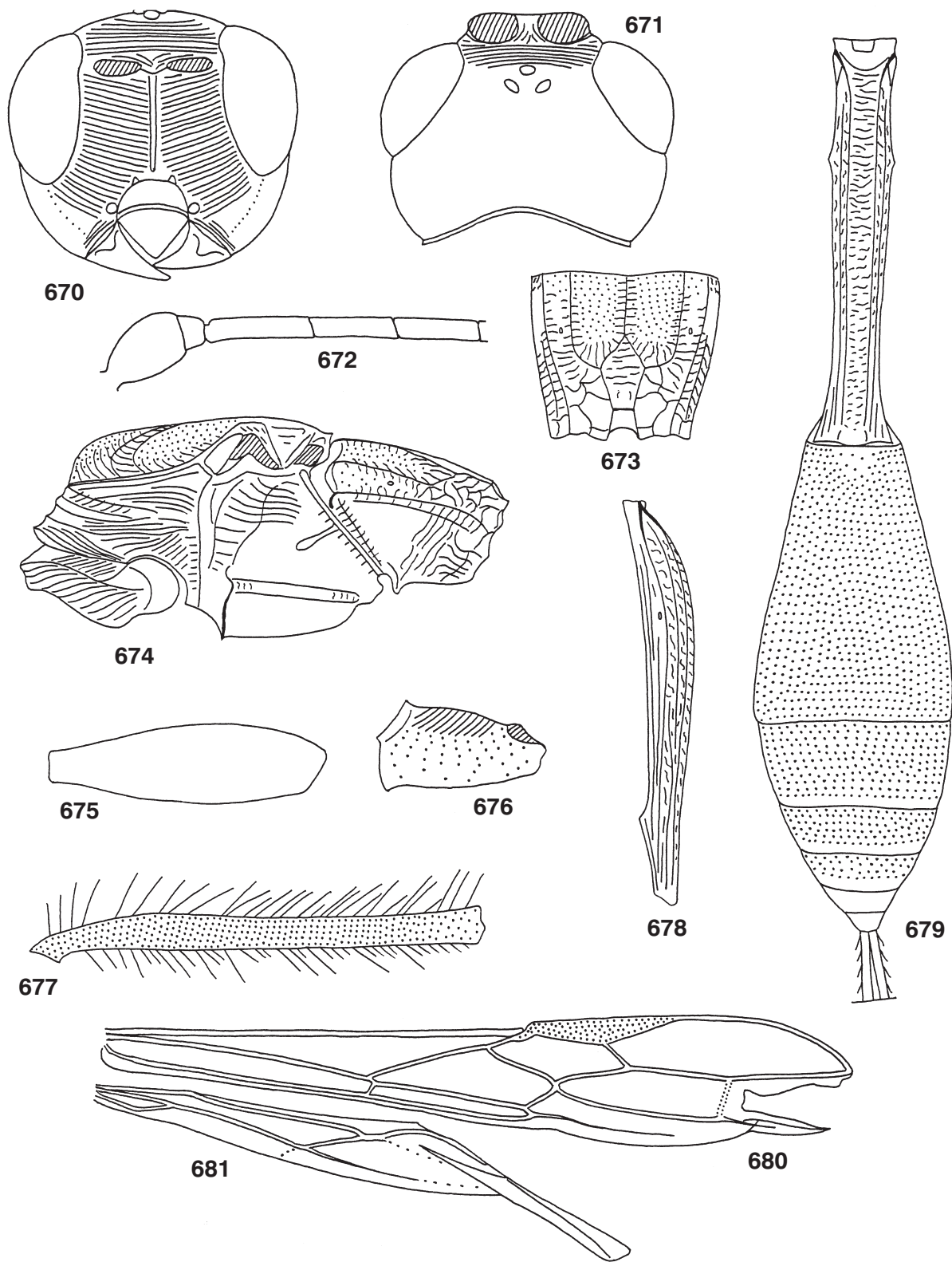
Spathius solox Enderlein, 1912

(Figs 670–681)

Spathius solox Enderlein, 1912: 5; Nixon 1943: 445; Shenefelt and Marsh 1976: 1419.

Material. Holotype: female, "Dohrn, Sumatra, Soekaranda", "Type" (red), "*Spathius solox* Enderl. ♀, Type, Dr. Enderlein det. 1912", "*Spathius testaceitarsis* Cameron, 1908, det Belokobylskij, 1991", "Mus. Zool. Polonicum, Warszawa, 12/45" (MIZW).

Description. Female. Body length 8.1 mm; fore wing length 5.5 mm. Head not depressed, its width 1.4 times median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.35 times length of temple. Ocelli medium sized, in triangle with base 1.3 times its sides; POL 1.2 times Od, 0.5 times OOL. Eye glabrous, 1.25 times as high as broad. Malar space height 0.45 times eye height and almost equal to basal width of mandible. Face width 0.9 times eye height and 1.1 times height of face and clypeus combined. Clypeal suture distinct and complete. Hypoclypeal depression round, its width 0.8 times distance from edge of depression to eye, 0.45 times width of face. Occipital carina absent at short distance near mandible and not fused with hypostomal



Figures 670–681. *S. solox*: (670) head, frontal view, (671) head, dorsal view, (672) 5 basal segments of antenna, (673) propodeum, (674) metasoma, lateral view, (675) hind femur, (676) hind coxa, (677) hind tibia, (678) petiole, lateral view, (679) metasoma, dorsal view, (680) fore wing, (681) hind wing.

carina, complete dorsally. Hypostomal flange narrow. Vertex convex.

Antennae slender, weakly setiform, more than 43-segmented (apical segments missing). Scape 1.6 times as long as wide. First flagellar segment 5.3 times as long as its apical width, 1.3 times as long as second segment. Subapical segments about 4.0 times as long as wide.

Mesosoma. Length of mesosoma 2.2 times its height. Pronotal keel distinct, posterior branch high and shortly fused medially with posterior margin of pronotum; anterior branch distinct and situated submedially. Pronotum without subanterior carina. Pronotal lateral depression rather wide, shallow, almost not marginated, curvedly crenulate. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep in anterior $\frac{2}{3}$, shallow in posterior $\frac{1}{3}$, complete, coarsely crenulate. Scutellum convex and not marginate laterally. Subalar depression shallow, wide, coarsely striate. Sternauli deep, but shallow in posterior $\frac{1}{4}$, almost straight, smooth medially, finely crenulate anteriorly and posteriorly, running along almost entire length of lower part of mesopleura. Postpectal carina absent. Metanotum with very short and pointed tooth. Metapleural flange rather short and narrow. Propodeum without lateral tubercles.

Wings. Fore wing 5.5 times as long as wide. Pterostigma 5.8 times as long as wide. Radial vein arising weakly behind middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 2.2 times first abscissa and forming obtuse angle with it, 0.8 times third abscissa, 1.4 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.8 times maximum width, 1.1 times length of rather wide brachial cell. Recurrent vein almost 10.0 times second abscissa of medial vein. Nervulus almost perpendicular to anal vein. Distance from nervulus to basal vein 0.15 times nervulus length. Parallel vein not interstitial, arising from anterior $\frac{1}{3}$ of distal vein of brachial cell. Mediocubital vein weakly curved to anal vein in distal half. Hind wing 6.5 times as long as wide. First costal abscissa 0.5 times second abscissa. First abscissa of mediocubital vein 0.5 times second abscissa. Recurrent vein unsclerotized, straight, oblique, antefurcal.

Legs. Fore tibia with rather dense numerous spines arranged in rather narrow stripe. Hind coxa large (its length about twice maximum width), with small basoventral tooth and distinct corner. Hind femur 3.4 times as long as wide. Hind tibia with 4 slender apical spines on outer margin. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.9 times as long as second-fifth segments combined; second tarsal segment 0.35 times as long as basitarsus, 1.2 times as long as fifth segment (without pretarsus); third segment 0.8 times as long as fifth one.

Metasoma. Petiole (lateral view) almost straight ventrally, dorsally slightly and regularly curved in basal half

and straight in apical half, thickened in basal $\frac{1}{3}$; distinctly widened in basal $\frac{1}{3}$ and apically, narrowed from spiracles to apical $\frac{1}{5}$ (dorsal view), with small spiracular tubercles in basal $\frac{1}{3}$. Length of petiole 5.0 times its apical width, 2.6 times length of propodeum; apical width 1.3 times width at level of spiracles, twice its minimum width. Second-fourth tergites with separated laterotergites. Second suture indistinct. Median length of second and third tergites combined 2.7 times basal width of second tergite, 1.4 times their maximum width. Ovipositor straight. Ovipositor sheath 1.6 times as long as metasoma, 3.7 times as long as petiole, 0.9 times as long as body, 1.4 times as long as fore wing.

Sculpture and pubescence. Vertex smooth. Frons entirely, finely, weakly undulately, densely and transversely striate. Face coarsely striate with rugosity between striae. Temple smooth. Mesoscutum very finely coriaceous, almost smooth partly, partly with rugae along notauli, with 2 long and weakly convergent strong carinae on narrow medioposterior area and with sparse transverse rugae between striae. Scutellum smooth, finely coriaceous posteriorly. Mesopleura smooth at most part. Metapleura smooth in anterior $\frac{1}{3}$, rugose-striate in posterior $\frac{2}{3}$. Propodeum with distinctly marginate areas, long basolateral areas very finely coriaceous with short coarse rugae along carinae; areola rather long and wide, densely transversely striate; petiolate area short, subsquare; propodeum rugose in posterior $\frac{2}{3}$; basal carina 1.6 times as long as fork of areola. Hind coxa dorsally concentrically striate in basal $\frac{2}{3}$, almost smooth in apical $\frac{1}{3}$, finely or very finely coriaceous laterally and ventrally. Hind femur entirely smooth. Petiole with complete dorsal carinae, rugose in basal $\frac{1}{3}$, striate in apical $\frac{1}{3}$. Second tergite densely rugose-reticulate. Third tergite very densely reticulate with granulation. Fourth-sixth tergites densely granulate. Mesoscutum with sparse long erect hairs situated along notauli and marginally. Mesopleura widely bare medially. Hairs on dorsal surface of hind tibia rather dense, semi-erect and long, their length 1.4–1.7 times maximum width of tibia.

Colour. Head reddish brown, dark dorsally and along occipital carina. Mesosoma black with reddish tint. Metasoma dark reddish brown, second and third tergites reddish brown. Antenna yellow, faintly darkened toward apex. Palpi pale yellow. Legs reddish brown, fore and middle coxae and trochanters yellow, all tarsi light brown or light reddish brown, hind tibia dark reddish brown, paler apically. Ovipositor sheath light brown, almost black apically. Fore wing faintly infusate. Pterostigma brown entirely.

Discussion. This species is in the *S. testaceitarsis* Cameron group. A study of the holotype of *S. solox* Enderlein and comparison with redescription of *S. testaceitarsis* Cameron (Indonesia, Philippines) (Nixon, 1943: 333–334) distinctly showed that *S. solox* is a junior

synonym of *S. testaceitarsis* (**syn. nov.**). The few differences of the holotype of *S. solox* from the redescription of *S. testaceitarsis* are very small and have only intraspecific meaning.

Distribution. Indonesia (Sumatra).

Group of *Spathius tityrus* Nixon

Spathius machanaoensis Shenefelt et Marsh, 1976
(Figs 682–692)

Spathius guamensis Fullaway, 1946: 226 (not *S. guamensis* Nixon 1943).

Spathius machanaoensis Shenefelt and Marsh, 1976: 1408
(nomen novum for *S. guamensis* Fullaway)

Material. Holotype: female, "Machanao, Guam, 6-30-1936", "O.H. Swezey Collector", "*Eleocarpus*", "ex. longicorn larvae under bark", "Type *Spathius guamensis*" (BPBM).

Description. Female. Body length 3.7 mm; fore wing length 2.8 mm. Head not depressed, its width 1.5 times median length. Frons weakly concave. Head behind eyes roundly narrowed. Transverse diameter of eye 1.8 times length of temple. Ocelli rather small, in triangle with base 1.2 times its sides; POL 1.3 times Od, 0.7 times OOL. Eye glabrous, 1.3 times as high as broad. Malar space height 0.3 times eye height and 0.7 times basal width of mandible. Face width 0.8 times eye height and equal to height of face and clypeus combined. Clypeal suture complete and distinct. Hypoclypeal depression round, its width 1.1 times distance from edge of depression to eye, 0.5 times width of face. Occipital carina shortly absent near mandible and not fused with hypostomal carina, complete and straight dorsally. Hypostomal flange narrow. Vertex convex.

Antennae slender, weakly setiform, 35-segmented, 1.4 times as long as body. Scape 1.7 times as long as wide. First flagellar segment 5 times as long as its apical width, 1.2 times as long as second segment. Penultimate segment 4 times as long as wide, 0.45 times as long as first segment, 0.9 times as long as apical segment; the latter pointed apically.

Mesosoma. Length of mesosoma about twice its height. Pronotal keel distinct, posterior branch almost straight dorsally, shortly fused medially with posterior margin of pronotum; anterior branch situated in posterior 1/3 of pronotum. Pronotum without subanterior carina. Pronotal lateral depression shallow, rather narrow, marginate, rather distinctly crenulate. Mesoscutum rather highly and roundly raised above pronotum. Median lobe without depression. Notauli rather deep and wide, complete, crenulate. Prescutellar depression deep, rather short, finely coriaceous, with 5 carinae, 0.33 times as long as scutellum. Scutellum weakly convex, wide, without distinct lateral carinae, 1.4 times as

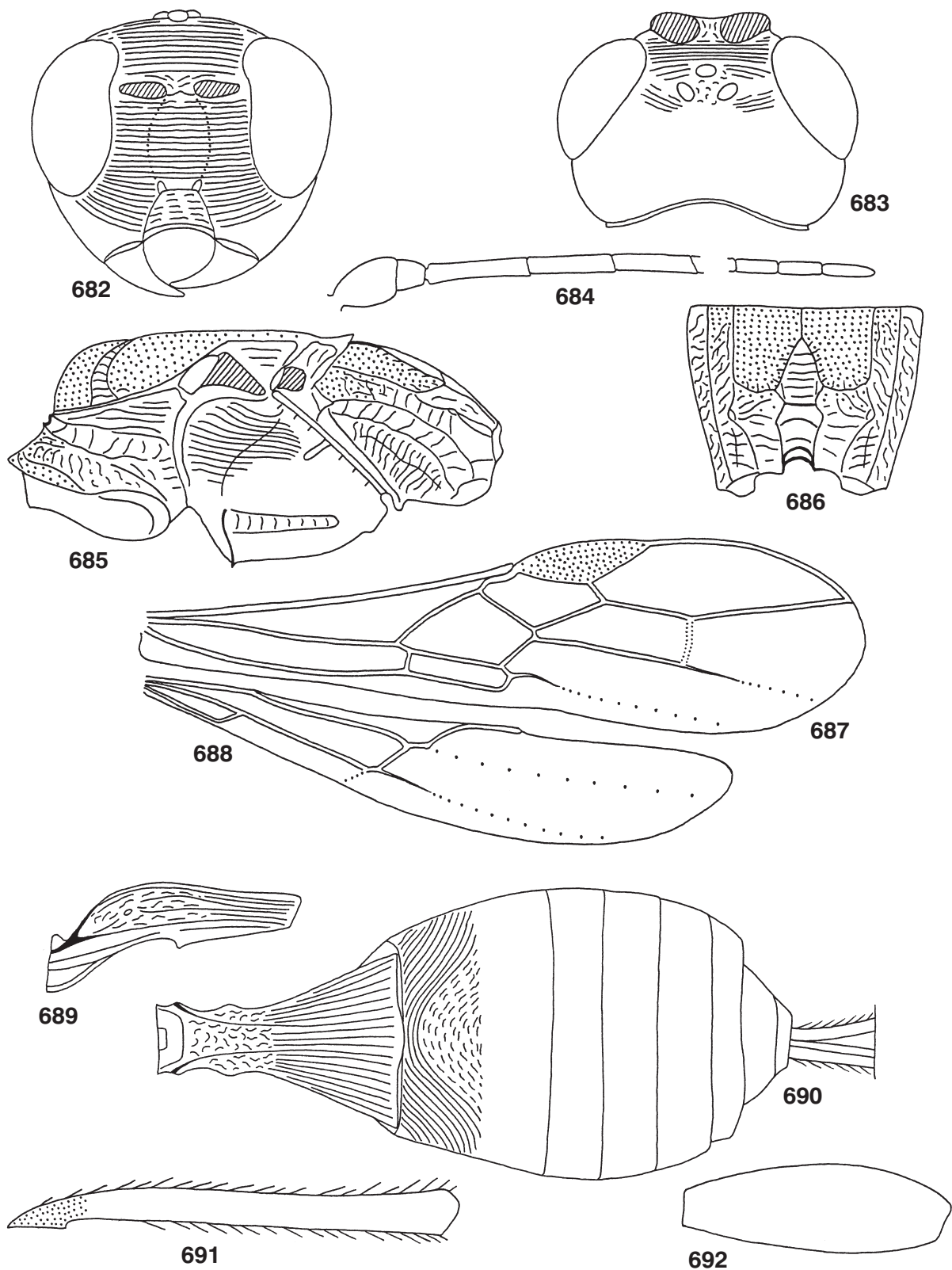
wide as long. Subalar depression shallow, wide, coarsely longitudinally striate. Sternauli shallow, straight, crenulate, running along anterior 2/3 of lower part of mesopleura. Postpectal carina absent. Metanotum with very short pointed tooth. Metapleural flange short and wide. Propodeum without lateral tubercles.

Wings. Fore wing 3.6 times as long as wide. Pterostigma 3.0 times as long as wide. Radial vein arising almost from middle of pterostigma. Radial cell not shortened; metacarpus 1.5 times as long as pterostigma. Second radial abscissa 3.7 times first abscissa and forming obtuse angle with it, 0.55 times third abscissa, 1.3 times first radiomedial vein. Second radiomedial cell not narrowed distally, its length 3.5 times maximum width, 1.5 times length of rather wide brachial cell. Recurrent vein about 5.0 times second abscissa of medial vein. Nervulus perpendicular to anal vein. Distance from nervulus to basal vein 0.6 times nervulus length. Parallel vein not interstitial, arising from anterior 1/3 of distal margin of brachial cell. Brachial cell closing behind level of recurrent vein. Mediocubital vein almost straight. Hind wing 5.5 times as long as wide. First costal abscissa 0.65 times second abscissa. First abscissa of medio-cubital vein 0.7 times second abscissa. Recurrent vein unsclerotized, oblique, almost interstitial.

Legs. Fore tibia with dense small spines arranged in rather wide stripe. Hind coxa medium size (its length 1.8 times maximum width), without basoventral tooth and corner. Hind femur 3.0 times as long as wide. Hind tibia with 5 slender apical spines on outer margin. Hind tarsus almost as long as hind tibia. Hind basitarsus 0.6 times as long as second-fifth segments combined; second tarsal segment 0.5 times as long as basitarsus, 1.3 times as long as fifth segment (without pretarsus).

Metasoma. Petiole (lateral view) distinctly and regularly curved ventrally, strongly and uniformly curved dorsally, weakly thickened in basal 1/3; strongly widened in apical 1/3, with small spiracular tubercles in basal 1/4. Length of petiole 1.4 times its apical width, 1.4 times length of propodeum; apical width 2.2 times width at level of spiracles, 2.5 times its minimum width. Second tergite with separated laterotergite basally only. Second suture indistinct. Median length of second and third tergites combined 0.8 times basal width of second tergite, 0.6 times their maximum width. Ovipositor weakly curved up. Ovipositor sheath 1.15 times as long as metasoma, 3.0 times as long as petiole, 1.4 times as long as mesosoma, 0.7 times as long as fore wing.

Sculpture and pubescence. Vertex smooth at most part, very finely aciculate anteriorly. Frons entirely densely striate with rugulosity between striae. Temple smooth. Face densely rugulose-striate. Mesoscutum densely and rather finely granulate, with convergent 2 striae in posterior half and with short rugulosity between striae. Scutellum finely coriaceous. Mesopleura striate in upper half, smooth in lower half. Metapleura rugose, fine-



Figures 682–692. *S. machanaoensis*: (682) head, frontal view, (683) head, dorsal view, (684) basal and apical segments of antenna, (685) metasoma, lateral view, (686) propodeum, (687) fore wing, (688) hind wing, (689) petiole, lateral view, (690) metasoma, dorsal view, (691) hind tibia, (692) hind femur.

ly rugulose anteriorly. Propodeum finely granulate in large basolateral areas, sparsely rugose with fine ground sculpture; areas distinctly marginate by high carinae; areola short, rather wide, with 4 transverse carinae; petiolate area wide, distinctly separated from areola; basal carina rather short, 0.8 times as long as fork of areola. Hind coxa finely granulate with very fine additional striation basally. Hind femur finely and densely striate on upper half, smooth on lower half. Petiole striate in apical half, reticulate-striate in basal half. Second tergite very finely curvedly transversely striate with dense reticulation partly. Rest of tergites smooth. Mesoscutum at most part with short dense and almost adpressed hairs, lateral lobe glabrous at small median area. Hairs on dorsal surface of hind tibia short, rather dense, semi-erect, their length 0.5–0.7 times maximum width of tibia.

Colour. Head brownish yellow. Mesosoma light reddish brown with small infuscate spots, propodeum black, dark reddish brown dorsally. Metasoma reddish brown to light reddish brown partly, petiole and middle of rest metasoma darker. Antenna reddish brown, two basal segments yellow. Palpi pale yellow. Legs yellow; hind tibia faintly infuscate basally, pale yellow in basal $\frac{1}{3}$, yellow on rest part; hind tarsus brown. Ovipositor sheath light reddish brown, brown in apical $\frac{1}{4}$. Fore wing very faintly and evenly infuscate. Pterostigma brown, paler at short areas basally and apically. Parastigma and apex of costal vein contrasting yellow.

Discussion. This species is in the *S. tityrus* Nixon group. It is quite clear, after study of the holotype of *S. machanaoensis* Shenefelt et Marsh (emendation for homonym *S. guamensis* Fullaway) and its comparison with the description of *S. guamensis* Nixon, that *S. machanaoensis* Shenefelt et Marsh, 1976 is a junior synonym of *S. guamensis* Nixon, 1943 (**syn. nov.**)

Distribution. Guam I.

Group of *Spathius urios* Nixon

Spathius annuliventris (Enderlein, 1912)

Stenophasmus annuliventris Enderlein, 1912: 11.

Spathius annuliventris: Nixon 1943: 448; Shenefelt and Marsh 1976: 1388; Belokobylskij 1996a: 181 (redescription, figures).

Material. Holotype: female, "Formosa, Takao, H. Sauter S., 11.8.[19]07", "Type" (red), "*Stenophasmus annuliventris* Enderl. ♀, Type, Dr Enderlein det. 1912", "Mus. Zool. Polonicum, Warszawa, 12/45" (MIZW).

Discussion. A detailed redescription of this species in the *S. urios* Nixon group was given in Belokobylskij (1996a: 181–183). This species is similar to *S. fragilis* Nixon (Nixon 1943: page 359) because of the pronotal keel separated from the posterior margin of the pronotum and the palpi pale yellow; the differences between these species are shown in the following key:

1. Vertex finely granulate-coriaceous. Metanotum with fine tooth. Hind tibia with 4 apical spines in outer side. Submedial cell of fore wing strongly constricted in posterior half. Second radial abscissa 4.7 times as long as first abscissa. Ovipositor sheath shorter, slightly longer than petiole *S. annuliventris* (Enderlein)
- Vertex with close and even transverse striation. Metanotum with sharp dentiform process. Hind tibia without apical spines. Submedial cell of fore wing weakly constricted in posterior half. Second radial abscissa 1.5 times as long as first abscissa. Ovipositor sheath longer, distinctly longer than petiole *S. fragilis* Nixon

Distribution. China (Taiwan).

Group of *Spathius vulnificus* Wilkinson

Spathius paracritolaus Belokobylskij, 1996

Spathius paracritolaus Belokobylskij, 1996a: 179.

Material. Holotype: female, China, "Taiwan, Wufeng, 28.III.1983, H. & M. Townes" (AEIG).

Discussion. A detailed description of this species in the *S. vulnificus* Wilkinson group was given by Belokobylskij (1996a: 179–181). This species is similar to the Indian *S. sul* Nixon (Nixon 1943: couplet 2, page 362); the differences are indicated in the following key:

- 2a. Frons densely and distinctly aciculate. Basolateral areas of propodeum marginate and entirely granulate. Submedial cell of fore wing distinctly narrowed in apical half. Parallel vein of fore wing not interstitial, arising from anterior $\frac{2}{3}$ of distal margin of brachial cell. Hairs of dorsal surface of hind tibia nearly as long as maximum width of hind tibia *S. paracritolaus* Belokobylskij
- Frons almost smooth. Basolateral areas of propodeum indistinctly marginate and with broken reticulation. Submedial cell of fore wing very weakly narrowed in apical half. Parallel vein of fore wing interstitial. Hairs of dorsal surface of hind tibia distinctly shorter than maximum width of hind tibia *S. sul* Nixon

This species is also similar to *S. critolaus* Nixon (Nixon 1943: couplet 3, page 362); the differences are the same as from *S. sul* Nixon (see above) and additionally the second and third tergites are finely and densely granulate.

Distribution. China (Taiwan).

APPENDIX

Thirty four species of *Spathius* from China have been described in Chinese (Chao 1956, 1977, 1978; Chao and Chen 1965). Below I include a list of the relevant species groups and species with some English remarks by the authors (if these remarks were presented in descriptions) and other useful information.

Group of *S. alternecoloratus* Chao

S. alternecoloratus Chao, 1978: 180–181 “This new species probably represents an isolate group of species which is peculiar in having the gaster clothed with scattered long hairs. Body length: 8.0–10.5 mm without ovipositor. 2 ♀♀, holotype and paratype, Yunnan”. The figures of the head (dorsal view with anterior part of mesosoma, and front view), fore and hind wings and metasoma dorsally are given in Chao (1978: 181).

Group of *Spathius antennalis* Szépligeti (*S. alipes* Wilkinson)

S. amabilis Chao, 1956: 13 description only in Chinese with figure of petiole laterally on page 13.

S. chumliuae Chao, 1956: 9–10 a redescription of this species is given in this paper; figures of the metasoma without petiole (lateral view), male genitalia, fore wing and petiole laterally are given also in Chao (1956: 9–10, 13; 1978: 176).

S. euthyradius Chao, 1978: 174–175 a redescription of this species is given in this paper; figures of the head (front view), anterior part of mesosoma (lateral view), metasoma without petiole (dorsal view) and mesoscutum (dorsal view) are given also in Chao (1978: 175).

S. evideus Chao, 1956: 10–11 description only in Chinese with figures of male genitalia and petiole laterally on pages 11 and 13.

S. fukienensis Chao, 1956: 11–13 description only in Chinese; figures of the fore and hind wings of female, medial part of hind wing of male, head laterally, metasoma without petiole, hind coxa dorsally, male genitalia and petiole laterally are given on pages 12 and 13.

S. longicornis Chao, 1978: 176 “Body length: 3.9 mm without ovipositor. 1 ♀, holotype, Yunnan. Similar to *S. opis rufovariegatus* Nixon, but different in coloration and the vestiture on the upper surface of the hind tibia. Besides, it has many more antennal segments”. Figures of the parts of fore and hind wings are given on page 176.

S. nigripetiolus Chao, 1978: 176–177 “Body length: 3.5 mm without ovipositor. 1 ♀, Yunnan. Similar to *evideus* Chao in the gaster being compressed and the ovipositor sheaths about as long as abdomen. They are different in the structure of the vertex”.

Group of *Spathius cassidorus* Nixon

S. pammelas Chao, 1978: 173–174 “The labiform ridge between areola and area petiolaris suggests its affinity with *cassidorus* Nixon. They are different in coloration, the subapical white band of the antennae, the length of the ovipositor sheaths and other respects. Body length: 3.1 mm without ovipositor. 1 ♀, holotype, Yunnan”. Figures of the head (lateral view) and anterior part of mesosoma are given on page 173.

Group of *Spathius exarator* (Linnaeus) (*S. sinicus* Chao)

S. bellus Chao, 1956: 5–6 description only in Chinese in the *S. sinicus* Chao group with figures of the anterior part of scutellum (Chao 1956: 5), mesoscutum laterally, areola of propodeum, scutellum and metasoma without petiole (Chao 1977: 210).

S. jilinensis Chao, 1977: 208 synonym of *S. generosus* Wilkinson (Belokobylskij 1998: 104).

S. lunganjiding Chao, 1977: 210–211 description only in Chinese in the *S. sinicus* Chao group.

S. nungdaensis Chao, 1977: 211 synonym of *S. generosus* Wilkinson (Belokobylskij 1998: 104).

S. poecilopterus Chao, 1977: 208–209 description only in Chinese with figure of the fore wing.

S. sinicus Chao, 1956: 3–5 description only in Chinese in the *S. sinicus* Chao group with figures of the fore and hind wings, anterior part of scutellum and male genitalia (Chao 1956: 4–5), propodeal areola and scutellum (Chao 1977: 210).

S. verustus Chao, 1977: 208 description only in Chinese.

Group of *Spathius fasciatus* Walker

S. beatus Chao, 1956: 7 description only in Chinese.

S. brunneus Chao, 1956: 6–7 description only in Chinese with figure of the petiole laterally on page 6.

S. crossospila Chao, 1977: 214–215 description only in Chinese with figure of the metasoma without petiole (dorsal view) on page 214.

S. hainanensis Chao, 1977: 216 description only in Chinese.

S. montivagans Chao, 1977: 215 description only in Chinese.

S. nanpingensis Chao, 1977: 212 description only in Chinese.

S. subtilis Chao, 1977: 216 description only in Chinese.

S. xanthocephalus Chao, 1977: 212–213 a redescription of this species is given in this paper; the figures of the head (front view), anterior part of mesosoma (lateral view) and metasoma (lateral view) are given also in Chao (1977: 213).

S. yinggenensis Chao, 1977: 214 description only in Chinese.

S. yunnanensis Chao, 1977: 215 a redescription of this species is given in this paper.

Group of *Spathius imbecillus* Enderlein

S. omiensis Chao, 1978: 181–182 “Body length: 3.5 mm without ovipositor. 1 ♀, holotype, Szechuan. This new species differs from other members of the group the following characters: petiole parallel-sided, its apical half not narrower as its basal; ovipositor sheaths longer than the body”.

Group of *Spathius labdacus* Nixon

S. deplanatus Chao, 1978: 180 "Body length: 4.2 mm without ovipositor. 1 ♀, holotype, Fukien. Extremely like *ochus* but different from that species by being even more depressed dorso-ventrally. In lateral view the thorax is 6 times as long as deep at the tegulae. Ovipositor sheaths shorter, only about 0.38 as long as the abdomen".

Group of *Spathius leucippus* Nixon

S. aspersus Chao, 1978: 177 "Body length: 4.7 mm 1 ♂, holotype, Fukien. The coloration of the gaster of the present new species, which is known from a male specimen, is very similar to that of the female of *S. miletus* Nixon of Taiwan Province. It differs from the latter in that the tergite (2+3) is 1.2 times instead of almost twice as long as its apical width. It differs from *S. leucippus* Nixon (Borneo) in that the petiole is only 1.7 instead of 2.5 times as long as propodeum". This species was recorded from Russian Far East (Belokobylskij 1989), but this recording should be verify after study of the holotype of *S. aspersus*.

Group of *Spathius moderabilis* Wilkinson

S. sedulus Chao, 1977: 207 description only in Chinese with figure of the part of fore wing.

Group of *Spathius rusticulus* Wilkinson

S. crebristriatus Chao, 1978: 178–179 "Body length: 3.5 mm without ovipositor. 1 ♀, holotype, Fukien. Both *crebristriatus* and the following new species *mundus* are closely allied to the exotic species *prusias* Nixon and *araeceri* Nixon. The presence of the Y-shaped posterior carina on the mesonotum will differentiate it from its allies". Figures of mesoscutum (dorsal view), anterior part of mesosoma (lateral view) and fore wing are given on page 179.

S. mundus Chao, 1978: 179 "Body length: 2.5 mm without ovipositor. 1 ♀, holotype, Fukien. This new species differs from *crebristriatus* as indicated in the above key". A key was published in Chinese only.

S. reticulatus Chao et Chen, 1965: 106–108 " This is reddish-brown species, with dark-brown postabdomen, and with ovipositor about as long as postabdomen (1.17:1). It is the first Chinese species of *Spathius* with the face having a satiny sheen due to a sculpture of excessively fine, absolutely even, transverse aciculation, like the surface of a gramophone record. Of the four species-groups having similar characteristics in Nixon's key (1943), this species seems to belong to the group of *rusticulus* Wilkinson in that the mesopleura are not coarsely rugose everywhere, and that the fore-wing are conspicuously dappled, the medius taking a deep downward

sweep at middle, the submedian cell hence distinctly constricted here. It differs from all other members of the group in that the submedian cell is crossed by a broad dark fascia which is not situated at but rather a little basal to its narrowest place and that there is no other brown mark in the basal portion of either median or submedian cell. This aberrant member of the group also differs from all its congeners in the structures of the propodeum and the tergite 2+3, as showed in Figs. 6 and 8. However, it shows some affinities with *rhianus* Nixon in having mesonotum in profile sloping gradually to the pronotum and in the bicolorous hind coxae which are yellow at base and brown at apex. The presence of the two basal carinae on mesonotum, though not V-shaped, also suggests its affinity with the above-mentioned species. Body length (without ovipositor) 3 mm. Holotype, ♀, Kiengyang hsien, Fukien, vii 8, 1963 (Chen, C. H. leg.). Deposited in the Fukien College of Agriculture". Figures of the head (from 3 sides), mesosoma laterally, mesoscutum, second and third tergites, propodeum, fore and hind wings are given on page 107 (Chao and Chen 1965). This species was recorded from Russian Far East (Belokobylskij 1989), but this recording should be verified after study of the holotype of *S. reticulatus*.

Group of *Spathius testaceitarsis* Cameron

S. magnus Chao, 1978: 178 "Body length: 10 mm without ovipositor. 1 ♀, holotype, Yunnan. This species differs from *testaceitarsis* Cameron as follows: hairs on upper surface of hind tibia not twice as long as its middle width, segments 3 of tarsus much shorter than 5, and tergite 4 not marginate".

ACKNOWLEDGEMENTS

I wish to express my sincerely thanks for following colleagues for the providing type and other specimens: Dr. J. Papp (HNHM), Dr. D. Smith (USNM), Dr. A. Radchenko (Kiev), Dr. E. Kierych and Mr. T. Huflejt (Warsaw), Dr. T. Matsumura (Tsukuba), Dr. K. Konishi (Sapporo), Mrs J. Casewitz-Wuellerse (Paris), Dr. D. Quicke (Ascot), Dr M. Fitton (London), Dr G. Nishida and Mr. K. Arakaki (Honolulu), Dr. A. Antropov (Moscow), Dr. M. Sharkey (Ottawa), late Dr. H. Townes (Gainesville), Dr. M. Fischer (Wien), Dr. K.-J. Hedqvist (Stockholm), Dr. C. Besuchet (Geneve), Dr. F. Koch (Berlin), Dr. A. Taeger (Eberswalde), Dr. Ph. Perkins (Cambridge, USA). I am thankful very much Dr. M.R. Shaw (Edinburgh) for his very useful linguistic remarks. I am very thankful also Dr. C. Van Achteberg (Leiden), Dr. J. Papp (Budapest) and Dr. A. Taeger Eberswalde) for the very useful remarks and comments of the deaft of this paper. The present work was partly supported by the Russian Foundation for Basic Research (grant no. 01-04-49655).

REFERENCES

- Ashmead, W.H. 1904. Descriptions of new genera and species of Hymenoptera from the Philippine Islands. Proceedings of the United States national Museum. 28: 127–158.
- Ashmead, W.H. 1905. New Hymenoptera from the Philippines. Proceedings of the United States national Museum. 29: 107–119.
- Belokobylskij, S.A. 1989. [Palaeartic braconid wasps of the genus *Spathius* Nees: *S. labdacus*, *S. urios*, *S. leucippus* species groups (Hymenoptera, Braconidae, Doryctinae)]. Trudy Zoologicheskogo Instituta AN SSSR, 188: 39–56.
- Belokobylskij, S.A. 1994. [Review of the Braconid wasps of the subfamilies Doryctinae and Exothecinae (Hymenoptera, Braconidae) Far East, Eastern Siberia and neighbouring territories]. Trudy zapovednika "Dauriskii". 3: 5–77 (in Russian).
- Belokobylskij, S.A. 1996a. A contribution to the knowledge of the Doryctinae of Taiwan (Hymenoptera: Braconidae). Zoosystematica Rossica, 5(1): 153–191.
- Belokobylskij, S.A. 1996b. [Parasitism on the beetles (Coleoptera) as important stage in the evolution of Braconid wasps (Hymenoptera, Braconidae). 1]. Entomologicheskoe obozrenie, 75(3): 660–676 (in Russian).
- Belokobylskij, S.A. 1998. [Subfam Doryctinae], pp. 50–109. In: Lehr P.A. (ed.). [Opredelitel' nasekomykh Dal'nego Vostoka Rossii. Tom 4. Setchatokryloobraznye, skorpionnityz, pereponchatokrylye. Chast' 3. Dal'nauka, Vladivostok (in Russian).
- Belokobylskij, S.A. and VI. Tobias, 1986. [Subfam. Doryctinae], pp. 21–72. In: Medvedev G.S. (ed). [Opredelitel' nasekomykh Evropejskoi chasti SSSR. Tom 3 Pereponchatokrylye. Chast' 4]. Nauka, Leningrad (in Russian).
- Belokobylskij, S.A. and VI. Tobias, 1998. [Introduction], pp. 8–26. In: Lehr P.A. (ed.). [Opredelitel' nasekomykh Dal'nego Vostoka Rossii. Tom 4. Setchatokryloobraznye, skorpionnityz, pereponchatokrylye. Chast' 3]. Dal'nauka, Vladivostok (in Russian).
- Brues, C.T. 1918. Parasitic Hymenoptera from the British Solomon Islands collected by Dr. W.M. Mann. Bulletin of the Museum of Comparative Zoology. 62(3): 98–130.
- Brues, C.T. 1924. Some South African parasitic Hymenoptera of the families Evaniidae, Braconidae, Alysiidae and Plumaridae in the South African Museum with a catalogue of the known species. Annals of the South African Museum. 29: 1–150.
- Cameron, P. 1910. On some asiatic species of the subfamilies Exothecinae, Spathiinae, Hormiinae, Cheloninae and Macrocentrinae in the Royal Berlin Zoological Museum. Tijdschrift voor Entomologie. 53: 41–55.
- Čapek, M., Hladil, J. and J. Sedivý 1982. Zoznam blanokridlych parazitov (Hymenoptera) dochovaných z hmyzích hostitelov. Cast VI. Entomologické Problémy, 17: 225–270.
- Chao, Hsiu-fu. 1956. [On south-eastern Chinese Braconid-flies of the subfamily Spathiinae (Braconidae)]. [Transactions of the Fujian Agricultural College], 4: 1–18 (in Chinese).
- Chao, Hsiu-fu. 1977. [A study on Chinese Braconid wasps of the tribe Spathiini (Hymenoptera: Braconidae, Doryctinae)]. Acta entomologica sinica. 20(2): 205–216 (in Chinese).
- Chao, Hsiu-fu. 1978. [A study on Chinese Braconid wasps of the tribe Spathiini (Hymenoptera, Braconidae, Doryctinae)]. Acta entomologica sinica. 21(2): 173–184 (in Chinese).
- Chao, Hsiu-fu and Chia-hua Chen. 1965. On a new species of *Spathius* from Fukien, China. Acta zootaxonomica sinica. 2(2): 106–108.
- Enderlein, G. 1912. Zur Kenntnis der Spathiinen und einiger verwandter Gruppen. Archiv fur Naturgeschichte, 78(2): 1–37.
- Fähringer, J. 1930. Opuscula braconologica. Palaearktische Region Braconinae (Cyclostomi Aut.). Cheloninae (Cryptogastres Aut.). 2: 1–160.
- Fischer, M. 1966a. Studien über Braconiden (Hymenoptera). Zeitschrift für Angewandte Zoologie, 53(2): 215–236.
- Fischer, M. 1966b. Zwei neue aus Buprestiden gezuchtete Braconiden (Hymenoptera). Entomophaga, 11(4): 341–346.
- Fischer, M. 1970. Eine neue *Spathius*-Art aus dem Iran (Hym. Braconidae). Annales de la Societe Entomologique de France, 6(3): 705–708.
- Fullaway, D.T. 1940. New species from the Bishop Museum collection of Samoan Parasitic Hymenoptera. Proceeding of the Hawaiian entomological Society. 10(3): 399–410.
- Fullaway, D.T. 1946. Insects of Guam. II. Coccidae. Hymenoptera, new species of Guam Chalcidoidea, Ichneumonidae, Evaniidae and Braconidae of Guam. Bulletin of Bernice P. Bishop Museum. 189: 221–227.
- Granger, C. 1949. Braconides de Madagascar. Memoires de l'Institut Scientifique de Madagascar, Seria A, Biologie Animale, 2: 1–428.
- Hedqvist, K.-J. (1975)1976. New species of *Spathius* Nees, 1818 and a key to the species of Europe and Canary Islands (Hym. Ichneumonoidea, Braconidae). Eos, 51: 51–63.
- Kurhade, S.M. and P.K. Nikam, 1994. On a new species of *Spathius* Nees (Hymenoptera: Braconidae) from India. Journal of the Bombay Natural Historical Society. 91: 441–443.
- Matthews, R.W. 1970. A revision of the genus *Spathius* in America North of Mexico (Hymenoptera, Braconidae). Contributions of the American Entomological Institute, 4(5): 1–86.
- Motschoulsky, V. 1863. Essai d'un catalogue des insectes de l'île Ceylan. Bulletin de la Societe Imperiale des naturalistes de Moscou, 36(3): 1–153.
- Niezabitowski, E.L. 1910. Materialy do fauny Braconidow Polski. I. Braconidae, zebrane w Galicyi. Sprawozdanie Komisji Fizyograficznej, 44(2): 47–105.
- Nixon, G.E.J. 1943. A revision of the Spathiinae of the Old World (Hymenoptera, Braconidae). Transaction of the royal entomological Society of London, 93(2): 173–456.
- Shenefelt, R.D. and P.M. Marsh, 1976. Hymenopterorum Catalogus. Pars 13. Braconidae 9. Doryctinae. 's-Gravenhage, Dr W. Junk, pp. 1263–1424.
- Szépligeti, G.V. 1900. Braconiden aus Neu-Guinea in der Sammlung des Ungarischen National-Museums. Termeszettajzi Fusetek, 23: 49–65.
- Szépligeti, G.V. 1902. Tropische Cenocoelioniden und Braconiden aus der Sammlung des Ungarischen National-Museum. Termeszettajzi Fusetek, 25: 39–84.
- Szépligeti, G.V. 1905. Exotische Braconiden aus den athiopischen, orientalischen und australischen Regionen. Annales historico-naturales Musei nationalis hungarici, 3: 25–55.
- Szépligeti, G.V. 1908. Jacobson'sche Hymenopteren aus Semarang (Java), Evaniiden, Braconiden und Ichneumoniden. Notes from the Leyden Museum, 29: 209–260.
- Szépligeti, G.V. 1910. E. Jacobson'sche Hymenoptera aus Java und Krakatau. Braconiden und Ichneumoniden. Teil II. Notes from the Leyden Museum, 32: 85–104.
- Szépligeti, G.V. 1913. Neue afrikanische Braconiden aus der Sammlung des ungarischen National-Museums. Annales historico-naturales Musei nationalis hungarici, 11: 592–608.
- Telenga, N.A. 1941. [Fauna SSSR. Nasekomye-pereponchatokrylye. Sem. Braconidae, podsem. Braconinae (prodolzhenie) i Sigalphinae]. Tom 5, N 3. 466 pp. Izdatel'stvo AN SSSR, Moskva-Leningrad (in Russian).
- Tobias, VI. 1961. [To the knowledge of the fauna of the braconid wasps of Siberia, Far East and Mongolia (Hymenoptera, Braconidae)]. Izvestiia Sibirskogo otdeleniia Akademii nauk SSSR, 11: 121–129 (in Russian).
- Tobias, VI. 1971. [Review of the Braconid wasps (Hymenoptera, Braconidae) of the USSR fauna]. Trudy Vsesoyuznogo entomologicheskogo obschestva. 54: 156–268 (in Russian).
- Watanabe, Ch. 1945. Note on some Micronesian Braconidae (Hymenoptera). Mushi, 16(9): 47–58.

INDEX OF THE *SPATHIUS* SPECIES AND SPECIES GROUP LISTED IN THE TEXT

bold number page for main information about species, usually with its redescription

italic number page for figures of species

- albiventris* Szépligeti **370**, 371, 372, 375
albonervosus Motschoulsky 349
alexandri Belokobylskij **457**, 458, 459, 461, 462
alipes Wilkinson (group) 349, 350, 484
alipes Wilkinson 352, 361, 363
alipes kokodaensis Nixon 352
alternecoloratus Chao (group) 349, 484
alternecoloratus Chao 484
amabilis Chao 484
amoenus Belokobylskij **377**, 378, 379
annuliventris (Enderlein) 349, **483**
antennalis Szépligeti (group) 349, 350, 354, 356, 361, 363, 484
antennalis Szépligeti **350**, 351, 352, 363
aphareus Nixon 447
apicalis Westwood 349, 473, 474, 476
apidanus Nixon (group) 363, 365
apidanus Nixon 365
araeceri Nixon 485
arcesius Nixon (group) 365, 367
arcesius Nixon 367, 368
asander Nixon 420
asclepiades Nixon 447
aspersus Chao 349, 485
athesis Nixon 406, 440
baiun Belokobylskij **398**, 399, 400
beatus Chao 484
bekilyensis Granger **365**, 366, 368
bellus Chao 386, 484
bion Nixon 417
brevicaudis Ratzeburg 395
briareus Nixon (group) 368, 370
briareus Nixon 370
brunneus Chao 484
canariensis Hedqvist **379**, 380, 393
capys Nixon (group) 370
cassidorus Nixon (group) 349, 370, 372, 374, 484
cassidorus Nixon 372, 374, 375, 484
cavillator Wilkinson 410
cavus Belokobylskij **381**, 382, 384
chrysogonus Nixon 476
chunliuae Chao 349, **352**, 353, 354, 356, 484
clavifemur Belokobylskij **401**, 402, 403, 413
colophon Nixon 403
convexitemporalis Belokobylskij 349, **403**
crebristriatus Chao 485
critolaus Nixon 483
crossospila Chao 484
curvicaudis Ratzeburg 384, 389
deccanensis Kurhade et Nikam 349
dentatus Telenga **386**, 387, 388, 389
deplanatus Chao 485
depressithorax Belokobylskij **384**, 385, 386
depressus Hedqvist 349
elaboratus Wilkinson (group) 375, 377, 469, 471
elaboratus Wilkinson 377
enderleini (Strand) 349
enippe Nixon 361
erymanthus Nixon 403, 406, 430
erythrocephalus Wesmael 388
esakii Watanabe **404**, 405, 406
euthyradius Chao 349, **354**, 355, 356, 484
evidens Chao 484
exarator (Linnaeus) (group) 349, 377, 379, 381, 384, 386, 388, 391, 393, 395, 398, 466, 484
exarator (Linnaeus) 349, 391, 398
fasciatus Walker (group) 349, 398, 400, 403, 406, 408, 410, 412, 415, 417, 420, 422, 425, 427, 430, 432, 435, 437, 440, 442, 443, 447, 451, 484
fasciatus Walker 400, 420, 430, 445
femoratis Westwood 478
flavicornis Szépligeti **406**, 407, 408
flavofulvus Nixon **356**, 357, 358, 359
fragilis Nixon 483
fukienensis Chao 484
fulvus Szépligeti **408**, 409, 410
fuscipennis Ashmead **359**, 360, 361
gades Nixon 427, 428, 443, 445, 451
generosus Wilkinson 349, 379, 386, 395, 398, 484
guamensis Fullaway 481, 483
guamensis Nixon 483
hainanensis Chao 484
helle Nixon 417, 418, 422, 427, 432, 442, 449, 451
hikoensis Belokobylskij **410**, 411, 412, 413
hirtus Hedqvist 391
honshuensis Belokobylskij **469**, 470, 471
imbecillus Enderlein (group) 349, 451, 454, 484
imbecillus (Enderlein) 454
insignis Granger (group) 454
insignis Granger **454**, 455
isocrates Nixon 432, 435
japenensis Nixon 410, 435
javanicus Szépligeti **413**, 414, 415, 432
jilinensis Chao 349, 484
kunashiri Belokobylskij **415**, 416, 417
labdacus Nixon (group) 349, 457, 459, 461, 464, 485
labdacus Nixon 459, 461
laeviceps Brues 359
lehri Belokobylskij **389**, 390, 391
leschii Belokobylskij **418**, 419, 420, 422, 423
lesovik Belokobylskij **420**, 421, 422, 423
leucippus Nixon (group) 349, 485
leucippus Nixon 485
longicornis Chao 484
lucullus Nixon 433
lunganjiding Chao 484
lynceus Nixon 443, 445
machanaoensis Shenefelt et Marsh **481**, 482, 483
maderi Fahringer 381, **391**, 392, 393
magnus Chao 485
manni Brues **471**, 472, 473, 476
medon Nixon 354, 356
melanophilae Fischer 348, 349, 459
melleus Brues **464**, 465, 466
melpomene Nixon 349, 356
miletus Nixon 485
mimeticus (Enderlein) 349, **478**

- minutissimus* Szépligeti **363**, 364, 365
minutus Szépligeti **372**, 373, 374, 375
moderabilis Wilkinson (group) 349, 485
montivagans Chao 427, 484
moscus Nixon 412, 420, 425, 445
mundus Chao 485
nanpingensis Chao 484
nanpactus Nixon 438
neleus Nixon 400, 401, 415
nigripetiolus Chao 484
ninus Nixon 417, 420
nungdaensis Chao 349, 484
obesus (Enderlein) **375**, 376, 377
ochus Nixon 459, 464, 485
omiensis Chao 484
opis rufovariegatus Nixon 484
pammelas Chao 484
paracritolaus Belokobylskij 349, 483
pedestris Wesmael 393
pedestris var. *maderi* Fahringer 391
pedunculatus Cameron 349
pelides Nixon (group) 432
pelides Nixon 433
pellitus Enderlein **423**, 424, 425
philippinensis Ashmead **466**, 467, 468, 469
philotas Nixon (group) 464, 466
philotas Nixon 466
phymatodis Fischer 348, 349, **393**, 394, 395, 396, 398
pilosus Szépligeti **473**, 474, 475, 476
piperis Wilkinson (group) 466, 468
piperis Wilkinson 468
planus Belokobylskij 395, **396**, 397, 398
poecilopterus Chao 484
polonicus Niezabitowski 349, **459**, 460, 462
pompelon Nixon (group) 454
prusias Nixon 485
psammathe Nixon 370
psammenitus Nixon 425
radialis Szépligeti **361**, 362, 363
radjabii Fischer 348, 349, 459
ratzayanus Ratzeburg 391, 395
reticulatus Chao et Chen 349, 485
rhianus Nixon 478, 485
robustus Belokobylskij **425**, 426, 427
rubidus (Rossi) 349, 395
ruficeps Smith (group) 469, 471, 473, 474, 476, 478
rufithorax Szépligeti 408, 430, 438
rufobrunneus Granger **428**, 429, 430
rufotestaceus Motschoulsky 349, **430**, 431, 432
rusticulus Wilkinson (group) 349, 478, 485
sabronensis Nixon 403
sedulus Chao 485
sinicus Chao (group) 349, 484
sinicus Chao 484
solor Enderlein **478**, 479, 480, 481
spasskensis Belokobylskij **433**, 434, 435
spectabilis Granger **435**, 436, 437
strandii Fahringer 349
subtilis Chao 484
sul Nixon 483, 484
sumatranus (Enderlein) **451**, 452, 453, 454
sutshanicus Belokobylskij **438**, 439, 440
tahitiensis Nixon 435
taiwanicus Belokobylskij 349, **476**
testaceitarsis Cameron (group) 349, 478, 480, 485
testaceitarsis Cameron 478, 480, 481, 485
testaceus Szépligeti, 1902 **440**, 441, 442
testaceus Szépligeti, 1913 356, 358
tityrus Nixon (group) 481, 483
trichiosomus Cameron **476**, 477, 478
trochanteratus Szépligeti (group) 454
tutuilensis Fullaway **442**, 443, 444, 445
udaegae Belokobylskij **462**, 463, 464
urios Nixon (group) 483
ussuriensis Tobias 348, 349
variipes Szépligeti **368**, 369, 370
verustus Chao 484
vesevus Nixon (group) 469
vladimiri Belokobylskij **445**, 446, 447, 451
voltur Nixon (group) 469
voltur Nixon 469
vulnificus Wilkinson (group) 349, 483
wusheensis Belokobylskij 349, **370**
xanthocephalus Chao 349, **447**, 448, 449, 484
yinggenensis Chao 484
yunnanensis Chao 349, **449**, 450, 451, 484

Received: February 20, 2003

Accepted: June 10, 2003