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The Agathidinae (Hymenoptera : Braconidae) of Japan[1]

by : Michael Joseph SHARKEY[2]

Abstract

The genera and species of the Agathidinae (Hymenoptera: Braconidae) of Japan are revised and keyed. Forty-one species are recognized of which 15 are new to science, i.e., *Agathis asternaulus, A. kumatai, A. maetoi, A. watanabei, Bassus coriarius, B. festivoides, B. gracilis, B. peniculus, B. spatulatus, B. spinosus, B. striogranulatus, Coccygidium nihonense, Coccygidium ruidum, Cremnops pappi,* and *Earinus longensis*. Twelve species names are synonymized, i.e., *Agathis shestakovi* SHENEFELT (1970) (replacement name for *M. bicolor* SHESTAKOV and *Microdus aino* (WATANABE) (1937)) with *Bassus tumidulus* (NEES von ESENBECK); *Bassus nantouensis* CHOU and SHARKEY (1989) with *B. cingulipes* (NEES von ESENBECK) (1814); *Bassus variablis* CHOU and SHARKEY (1989) with *B. conspicuus* (WESMAEL) (1837); *Bassus ater* CHOU and SHARKEY (1989) with *B. ebulus* (NIXON) (1950); *Microdus oranae* WATANABE (1970) with *B. festivus* (MUESEBECK) (1953); *Bassus diversus* MUESEBECK (1933) with *B. rufipes* (NEES von ESENBECK) (1814); *Braunsia graciliventris* BELOKOBYLSKIJ (1989) with *Braunsia antefurcalis* WATANABE (1937); *Agathis atricornis* SMITH (1874), *Cremnops alterans* ENDERLEIN (1920), and *Cremnops lemniscatus* ENDERLEIN

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(1920), all with *C. desertor* (LINNAEUS) (1758). Six new combinations are proposed, i.e., *Bassus inopinatae* (TOBIAS), *Bassus pilosus* (TOBIAS), *Bassus semistriatus* (WALKER), *Bassus ussuriensis* (TELENGA), *Coccygidium transcaspicum* (KOKUJEV), *Coccygidium varipes* (ACHTERBERG and MAETÔ).

Contents

Introduction

The Agathidinae are comprised of almost 1,000 described species and several times that number of undescribed species worldwide. Sixteen species have been recorded from Japan (MAETÔ 1989, ACHTERBERG and MAETÔ 1990). This study includes 41 species in 8 genera; 15 of the species are new to science.

All known agathidines are koinobiont endoparasitoids of larval Lepidoptera. Most host larvae are leaf rollers, or stem borers, though about 20% of the hosts are free living foragers that are often crepuscular or nocturnal. Usually eggs are laid in the first or second instar host larvae except for members of *Cremnops* and *Coccygidium* which attack later instars. The adult parasitoid emerges after the final instar of the host has spun its cocoon (NICKELS *et al.* 1950; DONDALE, 1954; ODEBIYI and OATMAN, 1972, 1977).

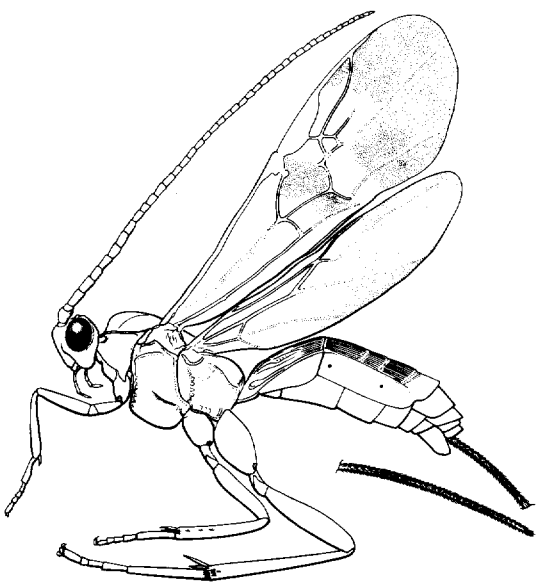


Fig. 1. *Braunsia matsumurai*

Few detailed studies of the biology of species of Agathidinae have been conducted. DONDALE (1954) described the life history of *Bassus dimidiator* NEES (as *Agathis laticinctus* CRESSON), which attacks the eye-spotted bud moth *Spilonota ocellana* (D. & S.), an orchard pest. SIMMONDS (1947) described the biology of *Cremnops vulgaris* (CRESSON) (as *Agathis vulgaris*), a parasite of the sugarbeet web-worm (*Loxostege sticticalis* L.). HUMMELEN (1974) studied the life history of *Alabagrus stigma* (BRULLÉ) (as *Agathis stigmaterus*) a parasite of *Diatraea saccharalis* (F.). ODEBIYI and OATMAN (1972, 1977) recorded the biology of *Agathis gibbosa* (SAY) and *Bassus unicolor* (as *Agathis unicolor*) parasites of the potato tuberworm, *Phthorimaea operculella* (ZELLER). Each of the works mentioned above gives a detailed account of the immature stages and assesses the value of the parasites as natural control agents.

Many members of the Agathidinae are important in the natural control of pest species of Lepidoptera. Some have been used in classical biological control programs, e.g., *Agathis pumila* (RATZEBURG) for the larch casebearer, *Coleophora laricella* (HÜBNER) (RYAN, 1990), and *Alabagrus stigma* (BRULLÉ) against the sugarcane borer, *Diatraea saccharalis* (F.) (HUMMELEN, 1974). Shaw and HUDDLESTON (1991) provide a more thorough review of the biology of the Agathidinae.

SHARKEY (1992) presents a general outline of the biology and phylogeny of the subfamily at the tribal level and presents arguments for the monophyly of these tribes and the subfamily as a whole.

Members of the Agathidinae that occur in Japan can be distinguished from all other braconids by the following set of characters: forewing vein M+CU not tubular in basal 3/4 or more; cell 1RS (2nd submarginal) of forewing small or rarely, as in *Aneurobracon*, absent; occipital carina not present; vein 2cu-a of forewing absent; RS vein of forewing meeting wing margin near stigma, thus forming a rather narrow 2R (marginal) cell (except *Aneurobracon* in which vein RS is absent).

Methods

The descriptions in this paper were generated using the software package DELTA (DALLWITZ, 1994). For all larger genera, I present a list of characters that are used in the descriptions. Each character is numbered in this list and a corresponding number is present in each description. This numbering system facilitates character comparisons between species. A distribution map is presented for each species. The non-Japanese specimens are recorded if the species is newly described but otherwise (with a few exceptions) these records are only summarized in the distribution section of the species treatment.

Within each genus the species descriptions are rigidly comparable, however these vary from genus to genus. This is because different characters are important for different genera. The species descriptions of some genera are quite simplified because there are few species in the genus and differentiating the member species is rather straightforward.

Morphological terminology follows HUBER and SHARKEY (1993) except for the ratio OOL: POL, where OOL=distance between lateral ocellus and compound eye, and POL=distance between lateral ocelli. Ratios are ususally given as a range and this range is indicated by a "—" between two numbers.

Abbreviations of Collections

CNC : Canadian National Collection of Insects, Agriculture Canada, Ottawa, Ontario K 1 A 0 C 6, Canada.

EIHU : Entomological Laboratory Institute, Faculty of Agriculture, Hokkaido University, Sapporo 060, Japan.

KMIC : Kaoru Maetô Insect Collection, Foretry and Forest Products Research Institute, Matsunosato 1, Kukizaki-machi, Inashiki-gun 305, Japan.

KUEC : Entomological Laboratory, Faculty of Agriculture, Kyushu University, Hakozaki, Higashi-ku, Fukuoka 812, Japan.

MCZ : Entomology Department, Museum of Comparitive Zoology, Harvard University, 26 Oxford St., Cambridge, Massachusetts, U.S.A.

NIAS : Laboratory of Insect Systematics, National Institute of Agro-Environmental Sciences, Kannondai, Tsukuba, Ibaraki Prefecture 305, Japan.

POLA : Museum of the Institute of Zoology, Polish Acedemy of Science, Wilcza 64, 00-679 Warszawa, Poland.

ZLMU : Insect Collection, Zoological Laboratory, Meijo University, Tenpaku-Ku, Nagoya 468, Japan.

ZMAS : Zoological Museum, Russian Academy of Science, Universitetskaya, Naberzhnayal, B-164, St. Petersburg, Russia.

Key to Genera of Japanese Agathidinae

1 Claws of fore and middle legs simple, with or without basal lobe (Figs 12 a-f) 2

– Claws of fore and middle legs bifid (cleft) (Figs. 13 b,c) 7

2 (1) Vein 2 RS 2 of forewing present (Figs 23 d, 25 a) 3

– Vein 2 RS 2 of forewing absent 4

3 (2) Notaulus and sternaulus present ..... *Braunsia*

– Notaulus and sternaulus absent ..... *Laccagathis*

4 (2) Vein RS+M of forewing present even if weak (Figs. 25 a-c) ..... *Earinus*

– Vein RS+M of forewing absent (Fig. 25 d, e) 5

5 (4) Venation of forewing greatly reduced, absent distad stigma except for r crossvein (Fig. 25 e) ..... *Aneurobracon*

– Venation of forewing more complete, at least RS also present distad stigma (Fig. 25 d) 6

6 (5) Galea elongate, always longer than wide (Fig. 4 e); propleuron flat or evenly convex, without a distinct bump (Fig. 10 a); coxal cavities not separated from metasomal foramen or separated by a narrow sclerite (11 d) ..... *Agathis*

– Galea not elongate, not longer than wide; propleuron usually (85%) with a distinct bump (Figs. 9a-c); coxal cavities usually (85%) separated from metasomal foramen by a wide sclerite (Figs 11 a,b) ..... *Bassus*

7 (1) Claws of fore and middle legs pectinate basally (Fig. 13 b); ovipositor at least as long as

metasoma ..... *Cremnops*

– Claws of fore and middle legs not modified basally (Fig. 13 c); ovipositor shorter than metasoma 8

8 (7) Hind trochanterellus with longitudinal carinae (Fig. 15 c); frons with (Fig. 3 b) or without (Fig. 3 a) lateral carinae ..... *Coccygidium*

– Hind trochanterellus without longitudinal carina; frons without lateral carinae (Fig. 3 c) ..... *Euagathis*

Species Treatments

AGATHIDINI Nees von Esenbeck

Agathides Nees von Esenbeck, 1814 : 184.
Agathites Blanchard, 1845 : 157, 164.
Agathidina Achterberg, 1990 : 32.

Agathis Latreille

Agathis Latreille 1804, p. 173. Type species : *Agathis malvacearum* Latreille.
Aenigmostomus Ashmead 1900, p. 128. Type species : *Microdus longipalpus* Cresson.

Remarks. Judging by many predecessors who have used masculine specific names in conjunction with the genus name *Agathis* the etymology of the generic name is poorly understood. *Agathis* is Greek, feminine, and means small ball of thread. The name probably refers to the cocoons, either of the hosts or perhaps of the parasites themselves.

Key to Japanese Species Of *Agathis*

1 Hind femur entirely black 2

– Hind femur entirely yellowish brown 4

– Hind femur black basally, yellowish brown distally ..... *Agathis pumila* Ratzeburg.

2 (1) Forefemur entirely yellowish brown; notaulus punctate anteriorly, smooth posteriorly; sternaulus absent ..... *Agathis asternaulus* n. sp.

– Forefemur black basally, yellowish brown distally; notaulus punctate along entire length; sternaulus present 3

3 (2) Basal lobe of foretarsal claws large (cf. Fig. 12 a); median tergite 2 smooth ..... *Agathis kumatai* n. sp.

– Basal lobe of foretarsal claws small or absent; median tergite 2 striate ..... *Agathis semiaciculata* Ivanov

4 (1) Basal black band or spot of hind tibia present (cf. Fig. 26 a); basal lobe of foretarsal claws small or absent (cf. Fig. 12 b); median tergite 1 completely striate ..... *Agathis maetoi* n. sp.

– Basal black band or spot of hind tibia absent; basal lobe of foretarsal claws large (Fig. 12 a); median tergite 1 mostly smooth, sometimes with striae medially (Fig. 16 a) ..... *Agathis watanabei* n. sp.

Character List For *Agathis* Species

1. body length excluding ovipositor in mm.
2. forefemur color.
3. hind femur color.
4. hind tibia color and presence of basal black band or spot (Fig. 26 a).
5. metasoma color.
6. number of flagellomeres.
7. OOL : POL. OOL=distance between lateral ocellus and compound eye. POL=distance between lateral ocelli.
8. malar space : eye height : galea length.
9. notaulus shape.
#10. presence of posterior semicircular depression of scutellum (Fig. 8d).
#11. sculpture of posterior surface of scutellum (Fig. 7c).
#12. metapleuron sculpture.
#13. sternaulus presence and completeness posteriorly.
#14. propodeum sculpture.
#15. ratio, hind femur length : hind femur width.
#16. size of basal lobe of foretarsal claw.
#17. number of spines on hind tibia.
#18. shape of 2RS cell of forewing.
#19. median tergite 1 sculpture.
#20. median tergite 2 sculpture.
#21. ratio, length of ovipositor : length of metasoma.

Species Descriptions of Japanese *Agathis*

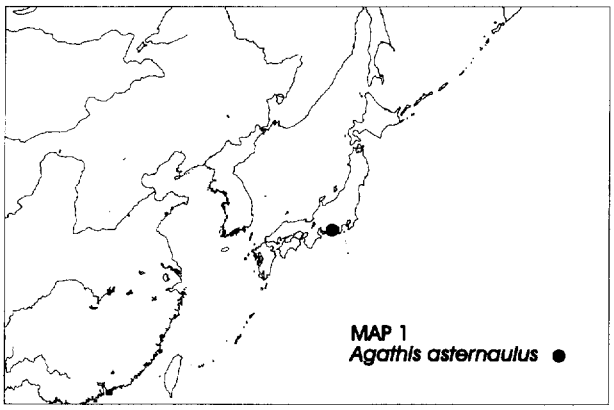
Agathis asternaulus NEW SPECIES

(Fig. 18a)

Length. (1) 3.2–3.8 mm.

Color. Black, except fore and middle legs distad trochanters yellowish brown; (2) forefemur yellowish brown; (3) hind femur black; (4) basal 0.6 of hind tibia yellowish brown except for basal black band or spot; (5) metasoma mostly black, but yellowish black at junction of median tergites 1 and 2.

Structure. (6) Number of flagellomeres=23–27. (7) OOL : POL=1.0–1.2; (8) malar space : eye height : galea length=1.9 : 3.6 : 2.1; (9) notaulus punctate anteriorly, smooth posteriorly; (10) posterior semicircular depression of scutellum absent; (11) posterior surface of scutellum smooth, or rugose (rugae weak if present); (12) metapleuron rugose in ventral 1/4, smooth dorsally; (13) sternaulus absent; (14) propodeum with sharply defined anterior transverse carinae and 2 or 3 median longitudinal carinae, rugose laterally and smooth mediolaterally; (15)



hind femur length : hind femur width = 2.6–3.0; (16) basal lobe of foretarsal claw small or absent; (17) hind tibia with 8 to 12 spines; (18) 2RS cell of forewing triangular (Fig. 18a); (19) median tergite 1 striate; (20) median tergite 2 smooth; (21) length of ovipositor : length of metasoma = 1.5–1.8.

Remarks. The specific name refers to the lack of a sternaulus in this species.

Distribution : Map 1.

Material Examined.

Holotype ♀, *Japan* : Shizuoka : FUKUYÔ in Kanaya, 28. ix. 1958 (MINAMIKAWA) (NIAS).

Paratype. *Japan* : Shizuoka : 1 ♀, FUKUYÔ in Kanaya, 28. ix. 1958 (MINAMIKAWA) (NIAS).

Agathis kumatai NEW SPECIES

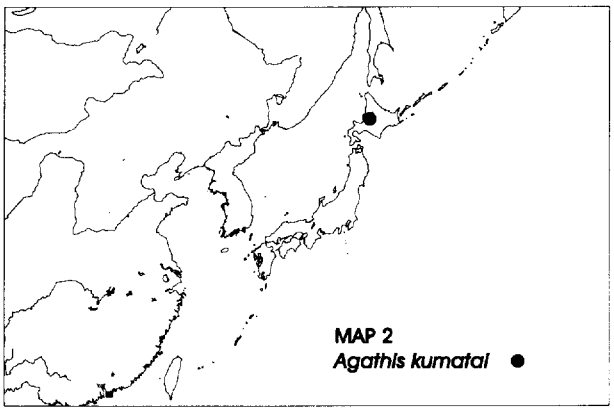
(Fig. 18 c)

Length. (1) 5.0–6.0 mm.

Color. Black, except tarsi and tibiae mostly yellowish brown; (2) forefemur black basally, yellowish brown distally; (3) hind femur black; (4) hind tibia yellowish brown in basal 3/4 with basal black band or spot of hind tibia present or absent; (5) metasoma black.

Structure. (6) Number of flagellomeres = 26–30. (7) OOL : POL = 1.1–1.3; (8) malar space : eye height : galea length = 3.1 : 4.0 : 1.5; (9) notaulus punctate along entire length; (10) posterior semicircular depression of scutellum absent; (11) posterior surface of scutellum rugose; (12) metapleuron rugose in ventral 1/2 smooth dorsally; (13) sternaulus present and complete posteriorly; (14) propodeum entirely rugose with 2 or 3 median longitudinal carinae; (15) hind femur length : hind femur width = 3.0–3.6; (16) basal lobe of foretarsal claw large; (17) hind tibia with 8–12 spines; (18) 2RS cell of forewing triangular (Fig. 18c); (19) median tergite 1 striate; (20) median tergite 2 smooth; (21) length of ovipositor : length of metasoma = 1.6–2.0.

Host. The label data on the two specimens include, "host 1067 Tortricidae on *Rhododendron aureum*"



Remarks. This species is named in honour of the collector of the two known specimens.

Distribution : Map 2.

Material Examined.

Holotype ♀, *Japan* : Hokkaido : Mt. KOIZUMI in Daisetu Mountains, Tortricidae on *Rhododendron aureum*, 16. ix. 1970 (KUMATA) (EIHU).

Paratype. *Japan* : Hokkaido : 1 ♂, Mt. KOIZUMI in Daisetu Mountains, Tortricidae on *Rhododendron aureum*, 16. ix. 1970 (KUMATA) (EIHU).

Agathis maetoi NEW SPECIES

(Fig. 18 b)

Length. (1) 2.5–3.9 mm.

Color. Black, except fore and middle legs distad trochanters yellowish brown; (2) fore-femur yellowish brown; (3) hind femur yellowish brown; (4) basal 4/5 of hind tibia yellowish brown except for basal black band or spot; (5) metasoma black.

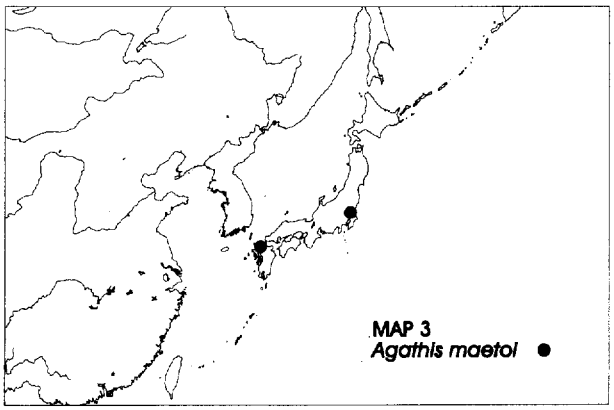
Structure. (6) Number of flagellomeres = 20–25. (7) OOL : POL = 1.0–1.3; (8) malar space : eye height : galea length = 1.8 : 3.0 : 1.6; (9) notaulus punctate along entire length; (10) posterior semicircular depression of scutellum absent; (11) posterior surface of scutellum rugose; (12) metapleuron rugose in ventral 1/3, smooth dorsally; (13) sternaulus present and complete posteriorly; (14) propodeum with anterior transverse carina and 2 or 3 median longitudinal carina, rugose laterally and smooth mediolaterally; (15) hind femur length : hind femur width = 2.5–3.2; (16) basal lobe of foretarsal claw small or absent; (17) hind tibia with 4–7 spines; (18) 2 RS cell of forewing triangular (Fig. 18 b); (19) median tergite 1 striate; (20) median tergite 2 striate or smooth; (21) ratio, length of ovipositor : length of metasoma = 1.1–1.8.

Remarks. The species is named after the Japanese Braconologist Kaoru Maetô.

Distribution : Map 3.

Material Examined.

Holotype ♀, *Japan* : Ibaraki : Tsukuba, 18–24. ix. 1989 (SHARKEY) (NIAS).



Allotype ♂, *Japan* : Ibaraki : Tsukuba, 5-11. ix. 1989 (SHARKEY) (CNC).
Paratype. *Japan* : Fukuoka : 1 ♀, Haruda in Fukuoka City, 8. ix. 1962 (SHIGA) (KUEC).

Agathis pumila RATZEBURG
(Figs. 3e, 8c, 10d, 17f, 18e)

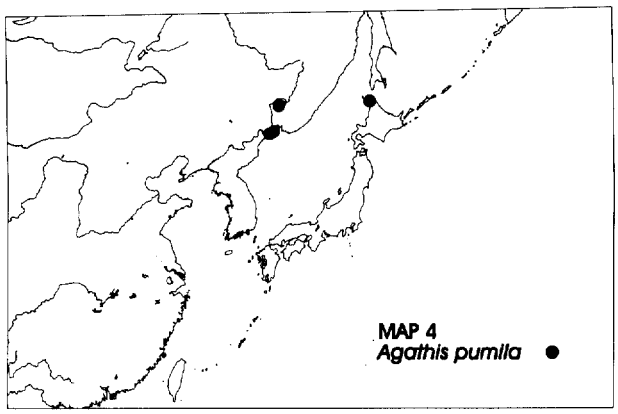
Agathis pumilus RATZEBURG, 1844. p. 57.
Eumicrodus pumilus : IVANOV, 1899. p. 375.
Bassus pumilus : DOWDEN, 1934, p. 601.
Agathis pumilus (a) : BALCH and HAWBOLDT, 1944. p. 107.

Length. (1) 2.5-3.8 mm.

Color. Black, except fore and middle legs yellowish brown distad coxae and hind leg partly yellowish brown; (2) forefemur yellowish brown; (3) hind femur black basally, yellowish brown distally; (4) hind tibia yellowish brown in basal 3/5 with basal black band or spot present or absent; (5) metasoma black.

Structure. (6) Number of flagellomeres=25-30. (7) ratio, OOL : POL=1.2-1.4 (Fig. 3e); (8) malar space : eye height : galea length=1.2 : 2.3 : 0.9; (9) notaulus punctate along entire length; (10) posterior semicircular depression of scutellum absent; (11) posterior surface of scutellum rugose; (12) metapleuron entirely rugose though weakly so dorsally; (13) sternaulus present but incomplete posteriorly (Fig. 10d); (14) propodeum entirely rugose with 2 or 3 median longitudinal carinae (Fig. 8c); (15) ratio, hind femur length : hind femur width=2.8-3.2; (16) basal lobe of foretarsal claw large (sharper than in *Agathis watanabei* (cf. Fig. 12a)); (17) hind tibia with 4-7 spines; (18) 2RS cell of forewing triangular, or quadrate (Fig. 18e); (19) median tergite 1 striate or rugose; (20) median tergite 2 striate, or smooth; (21) ratio, length of ovipositor : length of metasoma=0.9-1.2.

Host. There are no host records from Japan but the species has been extensively reared from the larch casebearer, *Coleophora laricella* (HÜBNER, 1814-17) (Coleophoridae). A questionable record reported in Shenefelt's (1970) catalogue is *Argyresthia laricella* KEARFOTT, 1908



(Argyresthiidae).

Distribution. Widespread throughout the northern Holarctic and introduced into North America where it is well established over a wide range. Map 4 shows the known distribution of Japanese and Russian Far East specimens although the species is undoubtedly more widespread in the Russian Far East.

Agathis semiaciculata IVANOV

(Figs. 3 f, 8 b, 10 a, 10 b, 17 e, 19 a)

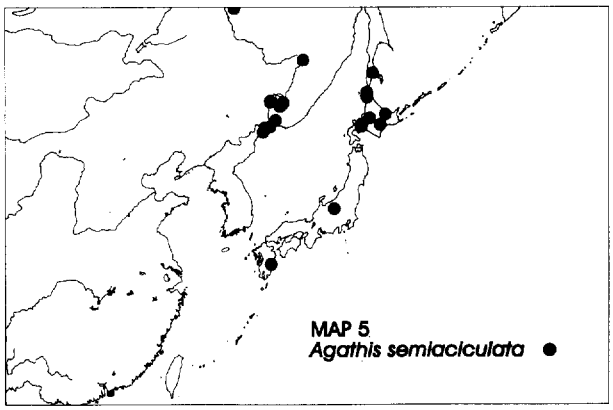
Agathis semiaciculatus IVANOV, 1899, p. 364.

Length (1) 3.0–4.7 mm.

Color. Black, fore and middle legs yellowish brown distad femur; (2) forefemur black basally, yellowish brown distally; (3) hind femur black; (4) hind tibia yellowish brown in basal 1/2 with basal black band or spot of hind tibia present; (5) metasoma black.

Structure. (6) Number of flagellomeres=23–26; (7) ratio, OOL : POL=0.9–1.0 (Fig. 3 f); (8) malar space : eye height : galea length=2.3 : 3.1 : 2.5; (9) notaulus punctate along entire length; (10) posterior semicircular depression of scutellum absent; (11) posterior surface of scutellum smooth, or rugose; (12) metapleuron rugose in ventral 1/5, smooth dorsally (Fig. 10 b); (13) sternaulus present and complete posteriorly (Fig. 10 b); (14) propodeum with anterior transverse carina and 2 or 3 median longitudinal carina present, smooth laterally (Fig. 8 b); (15) ratio, hind femur length : hind femur width=2.6–3.0; (16) basal lobe of foretarsal claw small or absent (cf. Fig. 12 b); (17) hind tibia with 4–7 spines; (18) 2RS cell of forewing triangular (Fig. 19 a); (19) median tergite 1 striate (Fig. 17 e); (20) median tergite 2 striate (at least in part) (Fig. 17 e); (21) ratio, length of ovipositor : length of metasoma=1.8–2.4.

Distribution. Map 5. Widespread in the Russian Far East as well as Japan.



Agathis watanabei NEW SPECIES
(Fig. 3d, 4f, 8d, 10c, 11d 12a, 18d)

Length. (1) 4.5–6.9 mm.

Color. Black, except fore and middle legs distad coxae yellowish brown and hind leg distad coxa yellowish brown except apical 1/5 of tibia and most of tarsus black; (2) forefemur yellowish brown; (3) hind femur yellowish brown; (4) basal black band or spot of hind tibia absent; (5) metasoma usually black but median tergite 2 may be orange especially on margins.

Structure. (6) Number of flagellomeres=24–29; (7) ratio, OOL : POL=0.9–1.0 (Fig. 3d); (8) malar space : eye height : galea length=2.2 : 4.0 : 1.5 (Fig. 4f); (9) notaulus punctate along entire length; (10) posterior semicircular depression of scutellum present (Fig. 8d); (11) posterior surface of scutellum smooth; (12) metapleuron rugose in ventral 1/4, smooth dorsally (Fig. 10c); (13) sternaulus present and complete posteriorly (Fig. 10c); (14) propodeum entirely rugose with 2 or 3 median longitudinal carinae present at least in anterior half (Fig. 8d); (15) ratio, hind femur length : hind femur width=2.8–3.2; (16) basal lobe of foretarsal claw large; (17) hind tibia with 7–11 spines; (18) 2RS cell of forewing triangular (Fig. 18 d); (19) median tergite 1 smooth or with weak striae medially (cf. Fig. 16 a); (20) median tergite 2 smooth; (21) ratio, length of ovipositor : length of metasoma=2.4–3.0.

Remarks. The species is named after the recently deceased father of Japanese Braconology, Chihisa Watanabe.

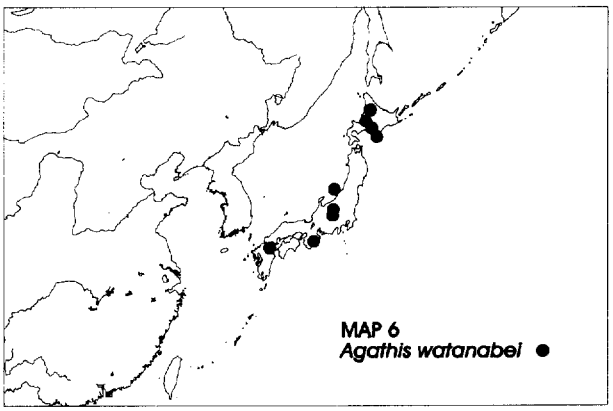
Distribution. Map 6.

Material Examined.

Holotype ♂, *Japan* : Hokkaido : Rubesu, Shibetsu & Nemuro, 25–28. viii. 1971 (YAMAGISHI) (ZLMU).

Allotype ♀, *Japan* : Hokkaido : Rubesu, Shibetsu & Nemuro, 25–28. viii. 1971 (YAMAGISHI) (ZLMU).

Paratypes. *Japan* : Fukuoka : 1 ♂, 2 ♀, Takada, 25. v. 1952 (KAWASE) (NIAS). Hokkaido : 1 ♀, Mt. Apoi, 21. viii. 1957 (TAKAGI) (EIHU); 1 ♀, Bibai, swept from undergrowth of *Pinus*, 5. vii. 1971



(MOMOI) (NIAS); 1 ♂, Kōshunai in Bibai, 30. vi. 1977 (YAMAGISHI) (KUEC); 1 ♀, Nukabira, 10. vii. 1961 (TAKADA) (EIHU); 1 ♀, Rubesu, Shibetsu & Nemuro, 25–28. viii. 1971 (YAMAGISHI) (ZLMU). Mie : 1 ♂, Owase, 16. xi. 1958 (ISHIDA) (NIAS). Nagano : 3 ♂, 7 ♀, Sugadaira, 22. viii. 1963 (SHIGA) (KUEC); 1 ♀, Tadesina, 11–15. viii. 1954 (KATSUYA, ASANO, ENDO, OZAWA-FUGITA) (NIAS). Niigata : 1 ♂, 1 ♀, Ryotsu on Sado Island, 27. viii. 1958 (KAMIJO) (EIHU).

CREMNOPTINI SHARKEY

Cremnoptini SHARKEY, 1992 : 437.

Cremnops FOERSTER

Cremnops FOERSTER 1862, p. 246. Type species *Agathis deflagrator* NEES von ESENBECK. Monobasic and original designation.

Remarks : See CHOU and SHARKEY (1989) for a discussion of the nomenclatural problems associated with *Cremnops*. See opinion 1758 of the International Commission of Zoological Nomenclature (ANONYMOUS, 1994) for a decision on the use of *Cremnops* FOERSTER versus *Vipio* LATREILLE.

Key to Japanese Species of *Cremnops*

1 Stigma partly or entirely yellow (Figs. 24 d, e); hind trochantellus lacking longitudinal carina ..... *Cremnops desertor* (LINNAEUS)

– Stigma without yellow color; hind trochantellus with pair of longitudinal carinae (cf. Fig. 15 c) ..... *Cremnops pappi* n. sp.

Species Descriptions of Japanese *Cremnops*

Cremnops desertor (LINNAEUS)

(Figs. 4e, 8e, 8f, 13a, 13b, 13e, 13f, 15e, 24d, 24e)

Ichneumon desertor LINNAEUS 1758, p. 563.

Cremnops desertor: MARSHALL 1890, p. 571.

Bracon deflagrator: SPINOLA 1808, p. 101.

Agathis deflagrator: NEES von ESENBECK 1814, p. 199.

Cremnops deflagrator: FOERSTER 1862. p. 246.

Agathis atricornis SMITH 1874, p. 398. NEW SYNONYM.

Cremnops atricornis: SHENEFELT 1970. p. 382

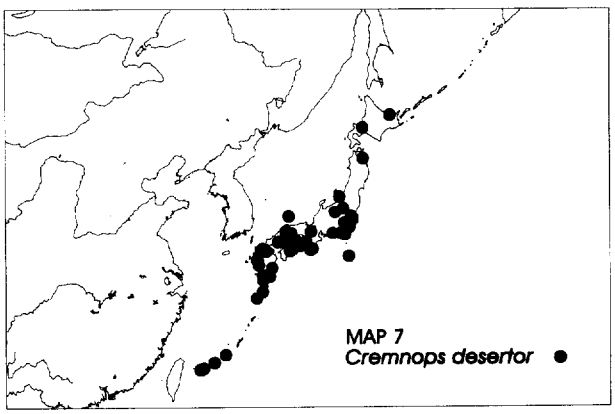
Cremnops alterans ENDERLEIN 1920, p. 185. NEW SYNONYM.

Cremnops lemniscatus ENDERLEIN 1920, p. 184. NEW SYNONYM.

Length. 4.7–9.3 mm.

Color. Usually mostly yellowish orange with brown hind tarsus and black as follows: antenna, vertex and apex of hind tibia; color varies considerably, specimens may be all black with some yellow on fore and middle legs; forewing usually banded with infuscate and clear patches (Fig. 24e) but ranging to almost entirely infuscate except stigma yellow basally (more than Fig. 24d); hind femur black, or yellowish orange.

Structure. Number of flagellomeres=37–43; ratio, OOL: POL=1.3–1.7; ratio, OOL: posterior ocellus diameter=2.3–2.6; malar space: eye height ratio=1.0–1.3 (Fig. 4e); sternaulus not reaching anterad mid length of mesopleuron, and crenulae, if present, restricted to the posterior 1/3 of mesopleuron; metapleuron smooth except ventral 1/3, or less, rugose; mesonotum (see Fig. 8f); hind trochantellus without longitudinal carina; ratio, hind femur length: hind femur width=3.0–4.0; hind femur smooth with weak punctures ventrally; hind tibia with 2 spines (Fig. 13e); propodeum areolate (Fig. 8e); ratio, length of median tergite 1: apical width of median tergite 1=1.7–2.2 (Fig. 15e); ratio, length of ovipositor: length of



metasoma=0.9-1.3.

Host : *Ostrinia nubilalis* (HÜBNER, 1796) (Pyralidae) has been recorded for specimens previously referred to as *Cremnops atricornis*.

SHENEFELT (1970) gives the following as hosts of European specimens : Pyralidae : *Sitochroa verticalis* (LINNAEUS, 1758); *Eutectona machoeralis* (WALKER, 1859); and *Eurrhypara hortulata* (LINNAEUS, 1758); Tortricidae : *Cydia pomonella* (LINNAEUS, 1758).

TOBIAS (1976 b, 1986) included *Synanthedon spheciformis* (DENIS & SCHIFFERMÜLLER, 1775) (Sesiidae). I agree with NIXON (1986), that the European list, which encompasses three host families, may be inaccurate. My guess, based on host records for other species of *Cremnops*, is that *C. atricornis* is restricted to members of the family Pyralidae.

Distribution. Map 7 shows the distribution of known Japanese specimens. *C. desertor* is widespread across the Palaearctic, although it does not extend far to the north. In Europe the most Northern specimen that I have seen is from The Netherlands. *C. desertor* is also known from Taiwan [as *C. atricornis* in CHOU and SHARKEY (1989)] and over much of the Oriental region. I have seen three specimens from the Nearctic region. One each from Ottawa (Canada), Hamilton (Canada), and Washington, D.C. (U.S.A.). These three specimens have all been collected recently in urban environments, leading me to suspect that the species was inadvertently introduced.

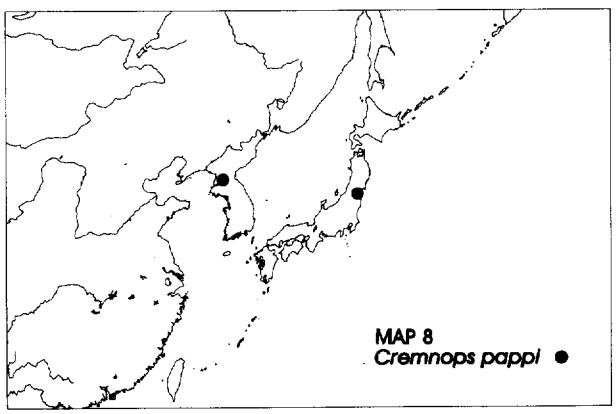
Remarks : See CHOU and SHARKEY (1989) for a discussion of the nomenclatorial problems associated with this species' name.

Cremnops pappi NEW SPECIES

Length. 8.5-11.5 mm.

Color. All black except mouthparts and fore and middle legs partly yellowish brown to yellow; forewing infuscate; stigma without yellow spot; hind femur black.

Structure. Number of flagellomeres=48; ratio, OOL : POL=1.2-1.4; ratio, OOL : posterior ocellus diameter=2.3-2.6; ratio, malar space : eye height=0.65-0.7; sternaulus reaching



epicnemial carina and deeply crenulate; metapleuron rugose except punctate in posterodorsal 1/4; hind trochantellus with 2 longitudinal carina (cf. Fig. 15c); ratio, hind femur length : hind femur width=2.4–2.8; hind femur rugosopunctate ventrally; hind tibia with 3–5 spines; propodeum areolate; ratio, length of median tergite 1 : apical width of median tergite 1=1.5–2.0; ratio, length of ovipositor : length of metasoma=1.3–1.7.

Distribution. Map 8.

Material Examined.

Holotype ♀, *Japan* : Miyagi : Takayama, viii. 1932 (GRESSITT) (MCZ).

Paratypes : *North Korea* : P'yongyang Prov.: 1 ♀, P'yongyang, 21. vii. 1959 (PISARSKI & PROSZYNSKI) (POLA); South P'yongan Prov.: 2 ♀♀, Lyong-ak san, 14 km W from P'yongyang, 30. vii. 1975 (PAPP & VOJNITS) (HNHM).

Remarks : *C. pappi* has an interesting morphological feature in that it is the only known species of *Cremnops* (or of the Cremnoptini) with a pair of carinae (or any carinae) on the hind trochantellus (cf. Fig. 15c). This character is widespread within the Disophrini (*Coccygidium* and allies) and also appears in one undescribed species of *Bassus* s.l. that I am aware of.

This species is named in honour of Dr. Jeno PAPP for his many contributions to braconology.

DISOPHRINI SHARKEY

Disophrini SHARKEY, 1992 : 439.

Coccygidium SAUSSURE

Coccygidium SAUSSURE, 1892, plate 15, figure 27. Type species : *Agathis lutea* BRULLÉ. Monobasic.

Brachyropalum KRIECHBAUMER, 1894, p. 312. Type species : *Brachyropalum pallidium* KRIECHBAUMER. Monobasic.

Neophylax ASHMEAD, 1900, p. 119. (Preoccupied) Type species : *Neophylax snyderi* ASHMEAD. Monobasic and original designation.

Zelomorpha ASHMEAD, 1900, p. 129. Type species : *Zelomorpha arizonensis* ASHMEAD. Monobasic and original designation.

Ahngeria KOKUJEV, 1902. p. 6. Type species : *Ahngeria transcaspia* KOKUJEV. Monobasic.

Lisitheria CAMERON, 1904a. p. 306. Type species : *Listheria nigricornis* CAMERON. Monobasic.

Xanthomicrodus CAMERON, 1904b. p. 157. Type species : *Xanthomicrodus iridipennis* CAMERON. Monobasic.

Caenophylax SCHULTZ, 1911, p. 88. (Replacement name for *Neophylax* ASHMEAD). Diatypic. Type species : *Neophylax snyderi* ASHMEAD.

Zelomorphidea VIERECK, 1912. p. 630. (As a subgenus). Type species : *Zelomorpha* (*Zelomorphidea*) *melanota* VIERECK. Monobasic and original designation.

Remarks : ACHTERBERG and MAETÔ (1990) rejected the synonymy of *Zelomorpha* with *Coccygidium* as proposed by Chou and SHARKEY (1989). They stated, "we consider the difference in shape of the forespur significantly (sic) enough to retain the genera *Zelomorpha* and *Coccygidium*", (ACHTERBERG and MAETÔ 1990 : 59). There is no question that *Zelomorpha* and *Coccygidium* are in some sense different, but cladistic classifications are based on derived

features (synapomorphies) not differences. *Coccygidium* sensu ACHTERBERG and MAETÔ is probably a monophyletic group that can be defined by the apomorphic state of a long foretibial spur (Fig. 15 b). The problem with recognizing *Coccygidium* sensu ACHTERBERG and MAETÔ is that it renders *Zelomorpha* paraphyletic. This point was clearly made by CHOU & SHARKEY (1989), but was not addressed by ACHTERBERG and MAETÔ (1990). Until the monophyly of *Coccygidium* excluding *Zelomorpha* is demonstrated, the synonymy of *Zelomorpha* with *Coccygidium* should be retained, as it is here.

Key to Japanese Species of *Coccygidium*

1 Hind femur black 2
– Hind femur pale 3
2 (1) Median tergites unicolorous ..... *Coccygidium ruidum* n. sp.
– Median tergites bicolorous, median tergite 1 and part of 2 ivory, contrasting with black terminal terga ..... *Coccygidium varipes* (ACHTERBERG and MAETÔ)
3 (1) Stigma with yellow color; frons unmargined, without carinae (Fig. 3 a); spur of foretibia less than 0.8×length of basitarsomere (Fig. 15 a) ..... *Coccygidium nihonense* n. sp.
– Stigma without yellow color (Fig. 24 b); frons margined with carinae (Fig. 3 b); spur of foretibia more than 0.9×length of basitarsomere (cf. Fig. 15 b) ..... *Coccygidium transcaspicum* (KOKUJEV)

Character List for *Coccygidium* Species

#1. body length (excluding ovipositor) in mm.
#2. color.
#3. hind femur color.
#4. stigma color.
#5. median tergites color.
#6. number of flagellomeres.
#7. ratio, OOL : POL. OOL=distance between lateral ocellus and compound eye. POL=distance between lateral ocelli.
#8. ratio, OOL : posterior ocellus diameter.
#9. frons.
  1. margined with carinae (Fig. 3 b).
  2. unmargined, without carinae (Fig. 3 a).
#10. ratio, malar space : eye height.
#11. propodeum sculpture.
#12. ratio, hind femur length : hind femur width.
#13. length of foretibial spur.
  1. more than 0.9×length of basitarsus (Fig. 15 b).
  2. less than 0.8×length of basitarsus (Fig. 15 a).

#14. hind femur sculpture.

Species Descriptions of Japanese *Coccygidium*

Coccygidium nihonense NEW SPECIES

(Figs. 3a, 15a, 23e)

Length. (1) 7.0-9.2 mm.

Color. (2) Color mostly dull yellow, with flagellum, anterior-most veins of forewing, hind tarsus and sometimes base and apex of hind tibia brown; (3) hind femur pale; (4) stigma with yellow color; (5) median tergites unicolorous.

Structure. (6) Number of flagellomeres=37-45; (7) ratio, OOL : POL=1.4-2.1; (8) ratio, OOL : posterior ocellus diameter=1.6-2.0; (9) frons unmargined, without carinae (Fig. 3 a); (10) ratio, malar space : eye height=0.46-0.55; (11) areolae of propodeum deep, posterior median areola present or absent; (12) ratio, hind femur length : hind femur width=3.8-4.6; (13) spur of foretibia less than 0.8×length of basitarsus (Fig. 15a); (14) hind femur weakly punctate laterally, weakly punctate to weakly rugose ventrally; forewing (Fig. 23e).

Remarks. This species is similar to *Coccygidium quadrifossulatum* ENDERLEIN but the color of the hind legs is different and the propodeal areolae are much deeper in specimens of *C. nihonense*. Superficially, there is also a great similarity with *Coccygidium concolor* (SZÉPLIGETI); however, *C. concolor* has the foretibial spur as long as the forebasitarsomere whereas the foretibial spur of *C. nihonense* is about 0.6 times the length of the forebasitarsomere.

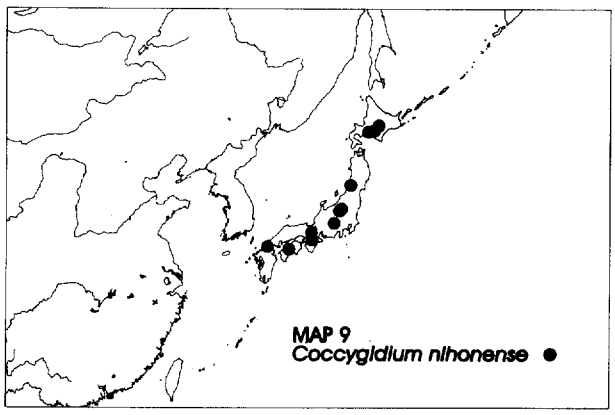
The specific name is a reference to Japan (Nihon).

Distribution : Map 9.

Material Examined.

Holotype ♀, *Japan* : Fukuoka : Mt. Hiko, 16-24. x. 1989 (TAKENO & SHARKEY) (NIAS).

Allotype ♂, *Japan* : Tochigi : Ohnuma Lk. in Shiobara, sweep, 10. viii. 1989 (SHARKEY) (NIAS).



Paratypes. *Japan* : Hiroshima : 1 ♂, Mt. Azuma, 10. viii. 1978 (MAETÔ) (KMIC). Hokkaido : 1 ♂, Nukabira, 24. viii. 1981 (SYÔNO) (KMIC); 1 ♂, Urimaku, 25. viii. 1981 (SYÔNO) (KMIC). Kōchi : 1 ♀, Hongawa (TOSA), vi. 1931 (WADA) (EIHU); 1 ♂, Tosa, 17. viii. 1933 (SUGIHARA) (EIHU). Kyoto : 1 ♂, Kyoto, 11. ix. 1965 (TAKADA) (EIHU); 1 ♂, Kibune, 6. viii. 1980 (YOSHIMOTO) (NIAS). Nagano : 1 ♀, Mt. Senyo, Todai, 30. vii. 1961, (KUEC). Niigata : 1 ♂, Shima, 24. vii. 1929 (TAKEUCHI) (EIHU). Yamagata : 1 ♂, Kodera, 11. viii. 1967 (KATSUYA) (NIAS).

Coccygidium ruidum NEW SPECIES

(Fig. 24 a)

Length. (1) 6.3–7.5 mm.

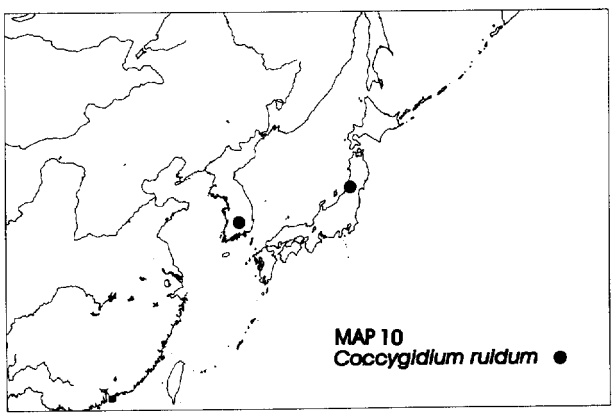
Color. (2) Black except fore and middle legs partly yellowish brown and eye orbits sometimes pale; (3) hind femur black; (4) stigma without yellow color; (5) median tergites unicolorous.

Structure. (6) Number of flagellomeres=36–43; (7) ratio, OOL : POL=1.4–1.7; (8) ratio, OOL : posterior ocellus diameter=2.0–2.4; (9) frons unmargined, without carinae; (10) ratio, malar space : eye height=0.45–0.50; (11) areolae of propodeum deep, posterior median areola absent; (12) ratio, hind femur length : hind femur width=3.3–3.7; (13) spur of foretibia less than 0.8× length of basitarsus; (14) hind femur coarsely punctate laterally, rugose ventrally; forewing (Fig. 24 a).

Remarks. This species is very similar to *Coccygidium nigrum* (BHAT and GUPTA), but *C. ruidum* differs from *C. nigrum* in the following : specimens of *C. ruidum* have much less pilosity, especially on the metapleuron, and the frons is much smoother. *C. nigrum* is known only from The Philippines.

The specific name is Latin for rough and refers to the sculpture on the ventral side of the hind femur.

Distribution. Map 10. Known only from the two specimens of the type series from Japan and Korea.



Material Examined.

Holotype ♂, *Japan*: Yamagata: Mt. Gassan, 10. viii. 1980 (GOTO) (NIAS).

Paratypes: *South Korea*: Kyongsangpuk-do: 1 ♀, Mt. Sudosan, 13–14. vii. 1971, 1000 m (YAMAGISHI) (ZLMU).

Coccygidium transcaspicum (KOKUJEV) NEW COMBINATION

(Figs. 3 b, 24 b)

Ahngeria transcaspica KOKUJEV, 1902. p. 6.

Zelomorpha transcaspica ACHTERBERG & MAETÔ (1990). p. 64.

Ahngeria opaca SHESTAKOV, 1928. p. 226

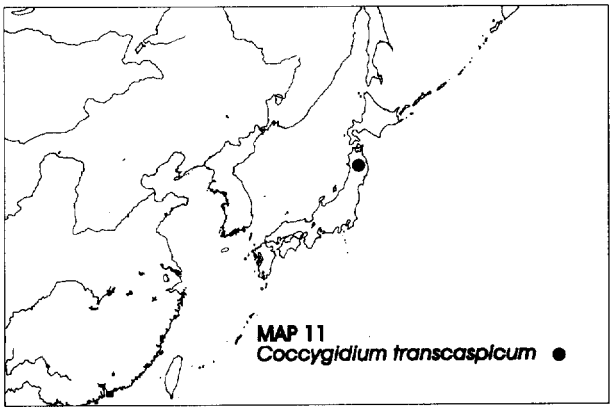
Length. (1) 6.3–7.5 mm.

Color. (2) Entirely dull yellow except antenna and anterior veins of forewing brown; (3) hind femur pale; (4) stigma without yellow color; (5) median tergites unicolorous.

Structure. (6) Number of flagellomeres=37–44; (7) ratio, OOL : POL=0.9–1.2; (8) ratio, OOL : posterior ocellus diameter=0.6–0.8; (9) frons margined with carinae (Fig. 3 b); (10) ratio, malar space : eye height=0.18–0.26; (11) areolae of propodeum deep, posterior median areola absent; (12) ratio, hind femur length : hind femur width=4.1–4.5; (13) spur of foretibia more than 0.9× length of basitarsus (cf. 15 b); (14) hind femur punctate laterally, weakly rugose ventrally; forewing (Fig. 24 b).

Distribution. Map 11 shows the locality of the sole Japanese specimen. The species is also known from middle Asia.

Remarks. *Coccygidium transcaspicum* is not known from the Russian Far East or Korea, therefore the record presented here represents a very large disjunction. This leads me to suspect that the sole specimen that I have from Japan may represent a new species. There are, however, no morphological features to substantiate this conjecture and therefore the specimen is provisionally assigned to *Coccygidium transcaspicum*.



Coccygidium varipes (ACHTERBERG and MAETÔ) NEW COMBINATION

(Fig. 24 c)

Zelomorpha varipes ACHTERBERG and MAETÔ, 1990. pp. 64-65.

Length. (1) 6.3-7.5 mm.

Color. (2) Multicolored, yellow, black, reddish brown, orange; head yellow, scape pale brown, remainder of antenna dark brown, prothorax yellow, mesonotum reddish brown to orange, middle leg entirely yellow or brown basally and yellow distally, mesopleuron yellow to black, metapleuron, propodeum and hind leg black, metasoma yellow in basal half black in distal half; (3) hind femur black; (4) stigma without yellow color; (5) median tergites bicolorous, median tergite 1 and part of 2 ivory contrasting with black terminal terga.

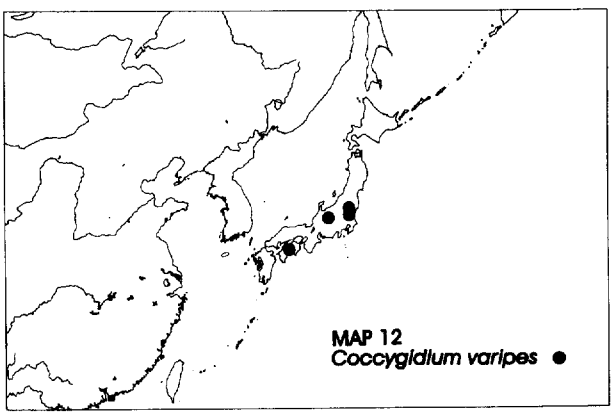
Structure. (6) Number of flagellomeres=38-45; (7) ratio, OOL : POL=1.2-1.4; (8) ratio, OOL : posterior ocellus diameter=1.5-1.7; (9) frons unmargined, without carinae; (10) ratio, malar space : eye height=0.48-0.54; (11) areolae of propodeum deep, posterior median areola absent; (12) ratio, hind femur length : hind femur width=3.8-4.2; (13) spur of foretibia less than 0.8× length of basitarsus; (14) hind femur coarsely punctate laterally, rugose ventrally; forewing (Fig. 24 c).

Distribution : Map 12 records the known Japanese specimens. The species is also known from the Russian Far East (BELOKOBYLSKIJ 1993).

Euagathis SZÉPLIGETI

Euagathis SZÉPLIGETI, 1900. p. 62. Type species : *Euagathis bifasciata* SZÉPLIGETI. DESIGNATED by VIERECK, 1914.

Chromomicrodus ASHMEAD, 1900. p. 129. Type species : *Chromomicrodus abbotti* ASHMEAD. Monobasic and original designation.



Key to Japanese Species of *Euagathis*

1 Forewing infuscate distally, yellow basally and around stigma, with distinct separation of yellow and infuscate areas; face yellow, frons black ···*Euagathis japonica* SZÉPLIGETI

– Forewing entirely yellowish-infuscate, sometimes somewhat more yellow basally but without distinct separation of yellow and infuscate areas; face and frons concolorous ·····*Euagathis seminovi* SHESTAKOV

Species Descriptions of Japanese *Euagathis*

Euagathis japonica SZÉPLIGETI

Euagathis japonica SZÉPLIGETI, 1902. p. 68.

Euagathis semiflavus SZÉPLIGETI, 1908 b. p. 228. *Euagathis formosana* ENDERLEIN, 1920. p 178.

Euagathis tricarinata ENDERLEIN, 1920. p 178.

Euagathis formosana var. *obscurior* ENDERLEIN, 1920. p 179.

Euagathis horniana ENDERLEIN, 1920. p 180.

Euagathis nigrifrons ENDERLEIN, 1920. p 180.

Length. 7.5–9.5 mm.

Color. Mostly yellow; vertex and frons black, sharply differing from yellow face; apical terga of metasoma brownish yellow to black; antenna brown to black; forewing infuscate distally, yellow basally and around stigma; yellow and infuscate areas sharply separated; legs yellow; hind tibia and tarsus brown to dark brown.

Head. Number of flagellomeres=51–55.

Mesosoma. Most of mesosoma weakly punctate; transverse carina of propodeum not produced into flange laterally.

Legs. Ratio, hind femur length: hind femur width=4.7–4.8; hind tibia with 3 spines apically.

Wings. 1+2RS cell of forewing triangular and usually petiolate.

Hosts. Lymantriidae: *Euproctis fraterna* (MOORE, 1882) *Euproctis guttata* (WALKER, 1855). Arctiidae: an unknown arctiid larva (BHAT and GUPTA 1977).

Remarks. Although the holotype is recorded as being from Japan by SZÉPLIGETI (1902), neither I nor WATANABE (1937) have seen a specimen captured in Japan. I suspect that the locality of the holotype may have been recorded in error. However, the species does occur in Taiwan (CHOU and SHARKEY 1989 [as *Euagathis semiflava*]) and it is possible that it also occurs in Japan.

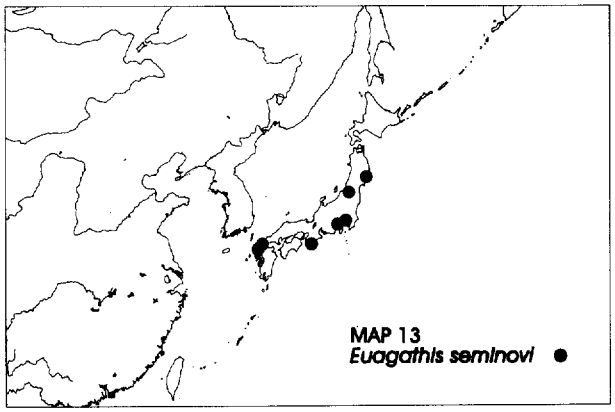
Distribution. Known from mainland China, India, Indonesia, Nepal, Pakistan, Sri Lanka, Taiwan and Thailand. See Remarks section for comments on the Japanese distribution.

Euagathis seminovi SHESTAKOV

(Fig. 3c, 25d)

Euagathis seminovi SHESTAKOV, 1940. p. 13.

Length. 6.5–10.6 mm.



Color. From entirely brownish yellow to mostly brownish black, often brownish black with the following areas yellowish brown : most of head including antenna, fore and middle legs, and ventral areas of metasoma; vertex and frons brownish yellow to black, vertex and frons concolorous with face; forewing entirely yellowish-infuscate, sometimes somewhat more yellow basally but without a distinct separation of yellow and infuscate areas; legs brownish yellow; hind tibia and tarsus brown to dark brown.

Head. Number of flagellomeres=47–53; dorsal aspect of head (Fig. 3c).

Mesosoma. Most of mesosoma rugosopunctate; transverse carina of propodeum produced into flange laterally.

Legs. Ratio, hind femur length : hind femur width=4.0–4.4; hind tibia with 2 spines apically.

Wings. 1+2RS cell of forewing quadrate and sessile (Fig. 25d).

Distribution. Map 13 shows the localities of the known Japanese specimens. The species is also known from North Korea.

EARININI SHARKEY

Earinini SHARKEY, 1992 : 441.

Earinus WESMAEL

Earinus WESMAEL 1837, p. 8. Type species : *Bassus gloriatorius* Panzer. Designated by MUESEBECK and WALKLEY (1951).

Key to Japanese Species of *Earinus*

1 Frons smooth (Fig. 5c); face weakly punctate with short setae (Fig. 5a) 2

– Frons usually with large irregular punctures (Fig. 5d); face strongly punctate with long setae (Fig. 5b) ..... *Earinus elator* (FABRICIUS)

2(1) Median tergite 2 smooth ..... *Earinus longensis* n. sp.

- Median tergite 2 striate or rugosostriate (Fig. 16 d) ·····*Earinus jezoensis* WATANABE

Species Descriptions of Japanese *Earinus*

Earinus elator (FABRICIUS)

(Figs. 5 b, 5 d, 16 c, 25 a)

Banchus elator FABRICIUS 1804, p. 128.

Microdus nitidulus NEES von ESENBECK 1814. p. 187.

Microdus thoracicus NEES von ESENBECK 1834. p. 143.

Earinus nitidulus : REINHARD 1867. p. 351.

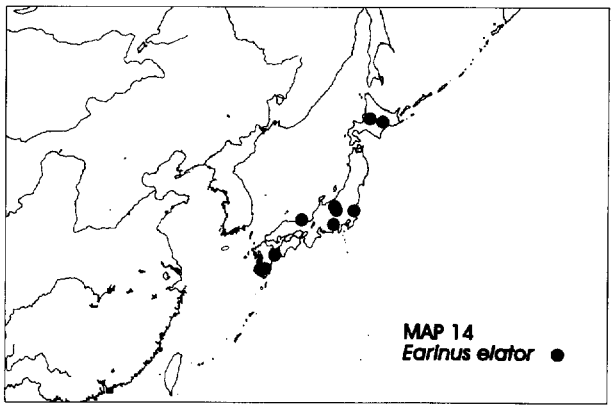
Earinus thoracicus : SHENEFELT 1970. p. 407.

Length. 6.9–8.8 mm.

Color. Forecoxa black, or yellowish orange, or a combination; foretrochanter yellowish orange; hind coxa black, or yellowish orange, or a combination; hind femur black or yellowish orange (There appear to be no intermediates in this character. Either the hind femur is entirely black or entirely pale yellowish orange. Males usually have the hind femur black, and if the specimens I observed are representative, almost all females have the hind femur yellowish orange. One long series from Mt. Tsukuba, has the entire range of variation in this character.); tegula black or pale yellow.

Structure. Number of flagellomeres=39–43; frons usually (except males rarely) with large irregular punctures (Fig. 5 d); face with dense deep punctures and long setae (Fig. 5 b); mesopleuron with dense, deep punctures; female propodeum mostly smooth laterally with longitudinal rugae medially, male as in female or more often with 2 or 3 sharply defined median longitudinal carinae; ratio, hind femur length : hind femur width=4.0–4.4; forewing (Fig. 25 a); median tergite 1 from smooth; mostly rugose; median tergite 2 smooth (Fig. 16 c); ratio, length of ovipositor : length of metasoma=1.6–1.9.

Distribution. Map 14 records the localities of the known Japanese specimens. The species



is widespread over most of the northern Palaearctic region.

Hosts. Noctuidae : *Agrochola circellaris* (HUFNAGEL, 1766); *Agrochola lota* CLERCK (1759) on *Salix caprea*; *Atethmia centrago* (HAWORTH, 1809).

Earinus jezoensis WATANABE

(Figs. 5a, 5c, 16d, 25b)

Earinus jezoensis WATANABE 1937. p. 83.

Length. 3.1–6.3 mm.

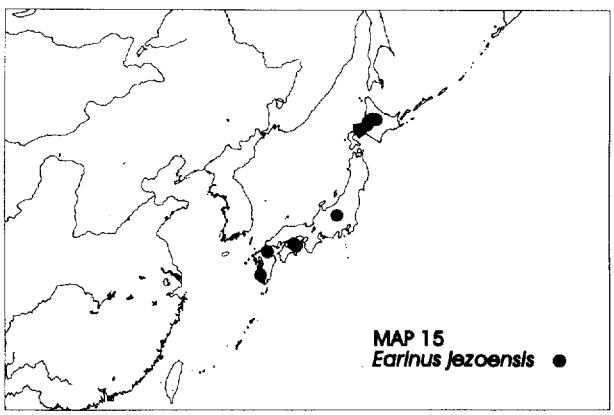
Color. Forecoxa black; foretrochanter black or yellowish orange; hind coxa black or yellowish orange; hind femur black or yellowish orange (or a combination); tegula black or yellowish orange.

Structure. Number of flagellomeres=32–36; frons smooth (Fig. 5c); face with relatively scattered shallow punctures and short setae (Fig. 5a); mesopleuron with scattered, shallow punctures; propodeum of male and female with two or three sharply defined median longitudinal carinae; ratio, hind femur length : hind femur width=3.2–3.6; forewing (Fig. 25b); median tergite 1 from smooth to rugosostriate (Fig. 16d); median tergite 2 striate or rugosostriate (often with some smooth areas) (Fig. 16d); ratio, length of ovipositor : length of metasoma=1.5–2.5.

Host. Tortricidae : *Zeiraphera rufimitrana truncata* OKU (new host record).

Remarks. This putative species shows considerable variation in color and in ovipositor length, suggesting the possibility of several species. I was not able, with the limited sample of specimens available, to ascertain whether or not these specimens represent a single species with a particularly wide range of variation, or several species. I have taken a conservative approach here and classify all specimens in one species.

Distribution. Map 15.



Earinus longensis NEW SPECIES

(Fig. 25 c)

Length. 5.2–6.9 mm.

Color. Forecoxa yellowish orange; foretrochanter yellowish orange; hind coxa black or yellowish orange; hind femur yellowish orange; tegula yellowish orange.

Structure. Number of flagellomeres = 30–38; frons smooth (cf. Fig. 5 c); face with relatively scattered shallow punctures and short setae (cf. Fig. 5 a); mesopleuron with scattered, shallow punctures; propodea of male and female with two or three sharply defined median longitudinal carinae; ratio, hind femur length : hind femur width = 3.7–4.8; forewing (Fig. 25 c); median tergite 1 smooth or smooth with weak rugae laterally; median tergite 2 smooth; ratio, length of ovipositor : length of metasoma = 2.2–2.6.

Remarks. The specific name means long sword in Latin and refers to the long ovipositor of this species.

Distribution. Map 16.

Material Examind.

Holotype ♂, *Japan* : Hokkaido : Sapporo, 20. vii. 1965 (KUSIGEMATI) (EIHU).

Allotype ♂, *Japan* : Hokkaido : Mt. Yubari, 10. viii. 1966 (KUSIGEMATI) (EIHU).

Paratypes. *Japan* : Nagano : 1 ♀, Kamikochi, Shinshu, 28. viii–3. ix. 63 (HIDAKA) (KUEC); Kumamoto : 1 ♂, Mt. Hakuchozan, Izumi-mura, 17. v. 1978 (OHARA) (EIHU).

EUMICRODINI FOERSTER

Eumicrodoidae FOERSTER, 1862. p. 228.

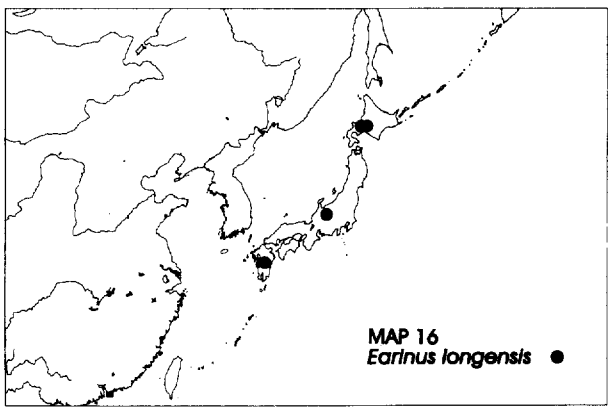
Microdini ASHMEAD, 1900. p. 128.

Mesocoelini VIERECK, 1918. p 69.

Aneurobraconinae FAHRINGER, 1937. p. 587.

Mesocoelina : ACHTERBERG, 1990. p. 33, 47.

Note : SHARKEY (1992) incorrectly applied the name Microdini to this tribe.



Aneurobracon BRUES

Aneurobracon BRUES, 1930, p. 1002. Type species : *Aneurobracon bequaerti* BRUES.

Remarks : SHARKEY (1986) showed that *Mesocoelus* and *Aneurobracon* are probably derived elements within *Bassus*. However, until a phylogenetic analysis of *Bassus* and allies is complete (SHARKEY, in prep.) I refrain from synonymizing these names under *Bassus*, a genus that probably will be redefined in the future.

Aneurobracon philippinensis (MUESEBECK)

(Figs. 13 d, 16 b, 25 e)

Mesocoelus philippinensis MUESEBECK 1932. p. 230.

Aneurobracon philippinensis : ACHTERBERG 1990. p. 39–40.

Length. 2.3–3.6 mm.

Color. Blackish brown; palpi and antenna dark brown; wings hyaline; fore and middle legs yellowish brown; hind leg darker; hind trochanter yellowish brown.

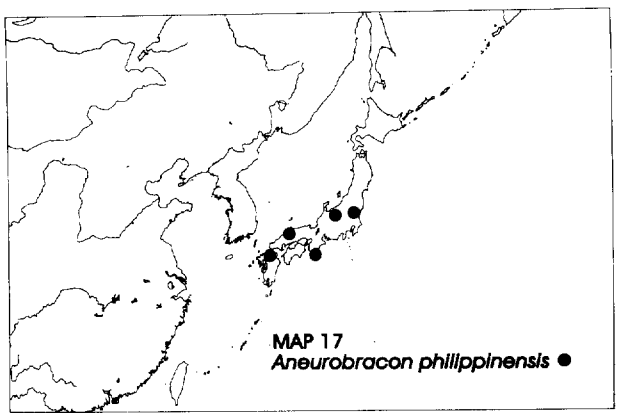
Head. Number of flagellomeres=21–23; ratio, malar space : eye height=0.61–0.62; gena rounded posteroventrally; interantennal space with weak, flat ridge; head mostly coriarious.

Mesosoma. Mesosoma mostly coriarious to weakly granulate; sternaulus deep and long, extending nearly to anterior margin of mesopleuron; hind coxal cavities open or very narrowly closed; propodeum granulate with longitudinal rugosities laterally and medially.

Legs. Ratio, hind femur length : hind femur width=4.1; hind tibia without specialized spines apically but covered with scattered, long, spine-like setae (Fig. 13 d); hind coxa coriarious; all tarsal claws simple, without basal lobes.

Wings. (Fig. 25 e) Venation greatly reduced.

Metasoma. (Fig. 16 b) Ratio, length of median tergite 1 : width of median tergite 1=1.8–2.0; median tergite 1 without pair of longitudinal carinae; median tergite 1 coriarious with weak striae anterolaterally; median tergite 2 weakly coriarious; median tergite 3 coriarious to



smooth (males have more distinct coriarious sculpture than females); ratio, length of ovipositor : length of metasoma = 1.4–1.7.

Hosts. Gracillariidae : *Acrocercops transecta* MEYRICK, 1931 was reported by YASUMATSU and KUROKO (1957); specimens deposited in the collection at the University of Kyushu were reared from *Spulerina dissotoma* (MEYRICK, 1931) (new host record).

Remarks. YASUMATSU and KUROKO (1957) figure the dorsal aspect of an adult female.

Distribution. Map 17 records the known Japanese specimens. Also known from The Philippines and Taiwan.

Bassus FABRICIUS

Bassus FABRICIUS 1804, p. 93. Type species. *Ichneumon calculator* FABRICIUS. Designated by CURTIS (1825).

Microdus NEES von ESENBECK, 1814. p. 184. Type species. *Ichneumon calculator* FABRICIUS. Designated by HALIDAY (1840).

Diplozon HALIDAY 1833, p. 263. Type species. *Ichneumon calculator* FABRICIUS. Monobasic.

Therophilus WESMAEL 1837, p. 15. (As subgenus of MICRODUS) Type species : *Microdus conspicuus* WESMAEL. Designated by VIERECK (1914).

Cenostomus FOERSTER 1862, p. 246. Type species *Cenostomus lugubris* FOERSTER. Monobasic and original designation.

Eumicrodus FOERSTER 1862, p. 247. (Emendation of MICRODUS). Type species : *Ichneumon calculator.*

Agathiella SZÉPLIGETI 1902, p.73. Type species *Agathiella pedunculata* SZÉPLIGETI. Monobasic.

Lytopylus VIERECK 1905, p. 267. Type species : *Lyptopylus azygos* VIERECK. Monobasic.

Aerophilopsis VIERECK 1913, p. 555–556. Type species : *Bassus erythrogaster* VIERECK. Monobasic and original designation.

Ioxia ENDERLEIN 1920, p. 119. Type species : *Ioxia faceta* ENDERLEIN. Monobasic and original designation.

Aerophilina ENDERLEIN 1920, p. 205. Type species : *Aerophilina bicristata* ENDERLIN. Monobasic and original designation.

Ditropia ENDERLEIN 1920, p. 210. Type species : *Ditropia strigata* ENDERLEIN. Monobasic and original designation.

Agathiella ENDERLEIN 1920, p. 211. Type species : *Agathiella columbiana* ENDERLEIN. Monobasic and original designation.

Obesomicrodus PAPP 1971, p. 338. Type species : *Obesomicrodus nigra* PAPP. Monobasic.

Key to Japanese Species of *Bassus*

1 Temple bulging as viewed dorsally (Fig. 2e); gena forming acute or 90 degree angle posteroventrally (Fig. 4c) 2

– Temple not bulging as viewed dorsally; gena rounded posteroventrally 3

2 (1) Hind coxa black; hind femur black ..... *Bassus semistriatus* (WALKER)

- Hind coxa yellowish brown; hind femur yellowish brown ···*Bassus inopinatae* (TOBIAS)
3 (1) Basal lobe of tarsal claws present (Figs 12 c, d, e). ····· 5
- Basal lobe of tarsal claws absent, claws simple (Fig. 12 f) ····· 4
4 (3) Mesoscutum orange·····*Bassus albifaciatus* (WATANABE)
- Mesoscutum black·····*Bassus ussuriensis* (TELENGA)
5 (3) Sculpture on median line of frons between antennae coriarius ···*Bassus coriarius* n. sp.
- Sculpture on median line of frons between antennae not coriarius ····· 6
6 (5) median tergite 3 smooth (Fig. 17 b, c) ····· 7
- median tergite 3 striate or striogranulate ·····14
7 (6) Hind coxa black ····· 8
- Hind coxa yellowish brown ·····12
- Hind coxa yellowish brown medially partly black laterally ·····
·····*Bassus conspicuus* (WESMAEL)
8 (7) Hind femur black····· 9
- Hind femur yellowish brown ·····*Bassus spatulatus* n. sp.
9 (8) Flagellomeres yellowish brown ·····*Bassus festivus* (MUESEBECK)
- Flagellomeres black ·····10
10(9) Last abscissa of RS vein of forewing sinuate (Fig. 19 d)·····*Bassus cingulipes* (NEES)
- Last abscissa of RS vein of forewing straight or weakly curved (e.g. Fig. 19 c) ·····11
11(10) Hind tibia entirely black, without basal black band or spot; spines on lateral surface of foretibia present (Fig. 14 a) ·····*Bassus spinosus* n. sp.
- Hind tibia yellowish brown or otherwise pale in basal 1/2 or more, but with basal black band or spot (cf. Fig. 26 a); spines of foretibia absent ·····*Bassus festivoides* n. sp.
12(7) Orbits of eye, at least in part, paler than temple and/or frons; ovipositor sheath not as wide as apex of hind tibia (include setae in measurements) ·····13
- Orbits of eye, at least in part, concolorous with temple and frons; ovipositor sheath wider than apex of hind tibia (include setae in measurements)···*Bassus peniculus* n. sp.
13(12) Hind coxal cavity either open (without a complete sclerite separating it from metasomal foramen) or rarely with a very narrow sclerite (Fig. 11 c); spines of foretibia absent ···
·····*Bassus conspicuus (WESMAEL)*
- Hind coxal cavity closed, with a wide sclerite separating it from metasomal foramen (cf. Fig. 11 b); spines of foretibia present (cf. Fig. 14 b)·····
·····*Bassus tumidulus* (NEES von ESENBECK)
14(6) Strong transverse carina of propodeal pseudosternite present (Fig. 11 a); interantennal space raised to converge on single point anteromedially (Fig. 2 b, c) ·····15
- Strong transverse carina of propodeal pseudosternite absent (Fig. 11 b); interantennal space flat or with weak median groove separating two prominences (Fig. 2 f), not converging on single point anteromedially·····17
15(14) Bump of propleuron weak (cf. Figs. 9 a, b) ·····*Bassus striogranulatus* n. sp.
- Bump of propleuron strong (cf. Fig. 9 c) ·····16
16(15) Hind tibia entirely black ·····*Bassus ebulus* (NIXON)

- Hind tibia partly yellowish brown ·····*Bassus rufipes* (NEES)

17(14) Hind coxa entirely black; median ridge between antennae (connecting face and median ocellus) present (Fig. 2c); posterior surface of scutellum rugose (Fig. 7d) ·····*Bassus pilosus* (TOBIAS)

- Hind coxa yellowish brown medially and partly black laterally; median ridge between antennae (connecting face and median ocellus) absent (cf. Fig. 2a); posterior surface of scutellum smooth ·····*Bassus gracilis* n. sp.

Character List For *Bassus Species*

#1. body length in mm.
#2. color of flagellomeres.
#3. color of eye orbits.
#4. general head color.
#5. foreleg color.
#6. middle leg color.
#7. hind coxa color.
#8. hind femur color.
#9. presence of basal black band or spot of hind tibia (Fig. 26a).
#10. hind tibia color.
#11. color of wings (infuscate or clear).
#12. mesosoma color.
#13. metasoma color.
#14. number of flagellomeres.
#15. ratio, OOL : POL. OOL=distance between lateral ocellus and compound eye. POL= distance between lateral ocelli.
#16. temple shape.
    1. bulging as viewed dorsally (Fig. 2e).
    2. not bulging as viewed dorsally (Figs 2a-d, f).
#17. ratio, malar space : eye height.
#18. gena shape posteroventrally.
    1. rounded posteroventrally (Fig. 4d).
    2. forming acute or 90 degree angle posteroventrally (Fig. 4c).
#19. presence of median ridge between antennae connecting face and median ocellus (Fig. 2c).
#20. shape of interantennal space anteriorly.
    1. raised to converge on single point anteromedially (Fig. 2c).
    2. flat or with weak median groove separating two prominences (Fig. 2f), not converging on single point anteromedially (Fig. 2a).
#21. depth of antennal depressions.
    1. deep (Fig. 2a).

2. not deep (Fig. 2 d).

#22. sculpture on median line between antennae.

#23. bump of propleuron (Figs 9 a–c).

#24. notaulus sculpture.

1. punctate along entire length.
2. punctate anteriorly, smooth posteriorly.
3. very weakly impressed and without punctures.

#25. presence of posterior semicircular depression of scutellum (Fig. 7 e).

#26. presence of posterior transverse ridge of scutellum (Figs 6 b, d, e, 7 e).

#27. sculpture of posterior surface of scutellum (Fig. 7 c).

#28. sculpture of metapleuron.

#29. sculpture of propodeum.

#30. presence of strong transverse carina of propodeal pseudosternite (Fig. 11 a).

#31. hind coxal cavity.

1. open, without a complete sclerite separating it from metasomal foramen (cf. Fig. 11 d).
2. closed, with a complete sclerite separating it from metasomal foramen (Fig. 11 a).

#32. ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity (hind leg usually must be removed).

#33. ratio, hind femur length : hind femur width.

#34. presence of spines on foretibia (Fig. 14 a).

#35. number of spines on hind tibia.

#36. presence of basal lobe of tarsal claw (Figs 12 a–d).

#37. shape of last abscissa of RS vein of forewing (Figs. 19 c–d).

#38. basal portion of free distal abscissa of CU vein of hind wing (Fig. 26 b).

1. tubular.
2. nebulous.
3. spectral.
4. absent.

#39. presence of pair of longitudinal carinae on median tergite 1 (Fig. 17 d).

#40. ratio, length of median tergite 1 : apical width of median tergite 1.

#41. sculpture of median tergite 1.

#42. sculpture of median tergite 2.

#43. sculpture of median tergite 3.

#44. ratio, length of ovipositor : length of metasoma.

#45. width of ovipositor sheath (include setae in measurements).

1. wider than apex of hind tibia.
2. not as wide as apex of hind tibia

Species Descriptions of Japanese *Bassus*

Bassus albifaciatus (WATANABE)

(Fig. 19 c)

Microdus albifaciatus WATANABE 1934 b, p. 201.

Agathis albifaciata : SHENEFELT 1970, p. 315.

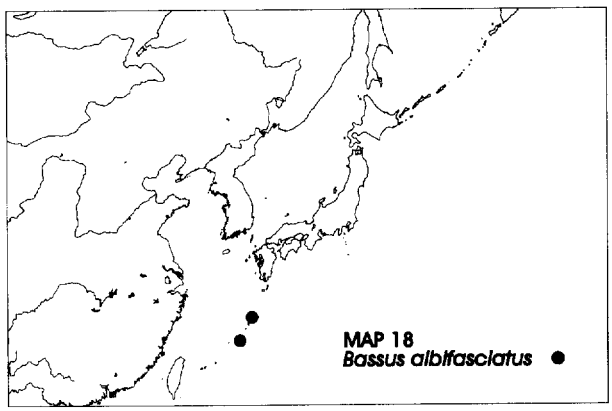
Bassus albifaciatus : CHOU and SHARKEY 1989, pp. 153–154.

Length. (1) 5.4–7.9 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons; (4) mouthparts yellow or yellowish brown, otherwise head black dorsally and yellowish brown ventrally; (5) foreleg orange or brownish orange; (6) middle leg orange or brownish orange; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in more than distal 1/2; (11) wings infuscate; (12) mesosoma orange except metapleuron, propodeum and sometimes metanotum brown; (13) metasoma brown except laterotergites and sterna of segments 1 and 2 pale yellow and median tergite 2 varying from brown to yellow (median tergite 2 usually yellow anteriorly and brown posteriorly).

Head. (14) Number of flagellomeres=30–36; (15) ratio, OOL : POL=1.6–2.2; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=4.8–5.6; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present (cf. Fig. 2 c); (20) interantennal space raised to converge on single point anteromedially (cf. Fig. 2 c); (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron absent or weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum present; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with complete



sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 1.4–2.0.

Legs. (33) Ratio, hind femur length : hind femur width = 3.3–3.7; (34) spines of foretibia present; (35) hind tibia with 7–12 spines; (36) basal lobe of tarsal claws absent, claws simple.

Wings. (Fig. 19 c). (37) Last abscissa of RS vein of forewing straight or weakly curved; (38) basal portion of free distal abscissa of CU vein of hind wing spectral or absent.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 present or absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.7–2.1; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.5–2.1; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Taiwan and Japan. See Map 18 for distribution of Japanese specimens.

Bassus cingulipes (NEES Von ESENBECK)

(Figures 8 a, 9 c, 17 c, 19 d)

Microdus cingulipes NEES Von ESENBECK 1814, p. 189.

Microdus (Therophilus) cingulipes : WESMAEL 1837, p. 18.

Therophilus cingulipes : MARSHALL 1872, p. 109.

Eumicrodus cingulipes : IVANOV 1899, p. 335.

Bassus cingulipes : THOMPSON 1953, pp. 94, 96.

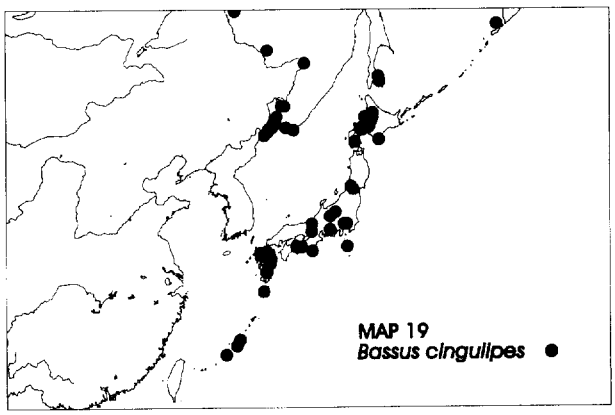
Agathis cingulipes : KLOET and HINCKS 1945, p. 234.

Agathis (Therophilus) cingulipes : HELLÉN 1957, p. 121.

Bassus nantouensis CHOU and SHARKEY 1989, pp. 165–166. NEW SYNONYM.

Length. (1) 2.9–5.9 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head black or black dorsally and yellowish brown ventrally; (5) foreleg from yellow to brown, usually coxa partly brown and



the remainder of leg yellowish brown; (6) middle leg from yellow to brown, usually coxa partly brown and remainder of leg yellowish brown; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia present or absent; (10) hind tibia black in less than distal 1/2; (11) wings weakly infuscate; (12) mesosoma black; (13) metasoma black except laterotergites and sterna of segments 1 and 2 usually somewhat yellowish brown, though usually not distinctly so.

Head. (14) Number of flagellomeres=27-35; (15) ratio, OOL : POL=1.2-1.6; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=2.7-4.0; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present or absent (carina usually weak or absent, but interantennal space often with two clearly defined but low longitudinal carina); (20) interantennal space raised to converge on single point anteromedially, or flat, or with weak median groove separating two prominences and not converging on single point anteromedially (usually median carina divided by a weak median groove); (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (Figs 8a, 9c). (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum present or absent; (26) posterior transverse ridge of scutellum present or absent; (27) posterior surface of scutellum rugose; (29) propodeum of female rugose with lateral longitudinal and median transverse carinae, propodeum of male often without rugae and with more pronounced carinae; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity=1.3-1.9.

Legs. (33) Ratio, hind femur length : hind femur width=2.7-3.3; (34) spines of foretibia absent; (35) hind tibia with 8-16 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing sinuate (Fig. 19d); (38) basal portion of free distal abscissa of CU vein of hind wing tubular or nebulous.

Metasoma. (Fig. 17c). (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1=1.1-1.4; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma=1.7-2.3; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Widespread across the Palaearctic, from Europe to the Russian Far East and Taiwan. See Map 19 for the distribution of Japanese and Russian Far East specimens.

Remarks. *B. cingulipes* is very similar to *Bassus curvabilis* BHAT and GUPTA and the two names may be synonymous. My small sample of non-Japanese material precludes a conclusion at this time.

Hosts. According to NIXON (1986).

Gelichiidae : *Caryocolum fraterella* DOUGLAS, on *Abies grandis*.

Coleophoridae : *Coleophora frischella* (LINNAEUS), on *Pinus*.

Bassus conspicuus (WESMAEL)

(Figs. 2f, 7a, 7b, 11c, 12d, 14f, 19e, 26b)

Microdus (Therophilus) conspicuus WESMAEL 1837, p. 17.

Eumicrodus conspicuus : IVANOV 1899, p. 371.

Bassus conspicuus : BRITTON 1938, p. 123.

Agathis conspicua : KLOET and HINCKS 1945, p. 234.

Microdus tumidulus var. *conspicuus* : SZÉPLIGETI 1908a, p. 423.

Bassus carpocapsae CUSHMAN 1915, p. 508.

Earinus zonatus MARSHALL 1885, p. 268.

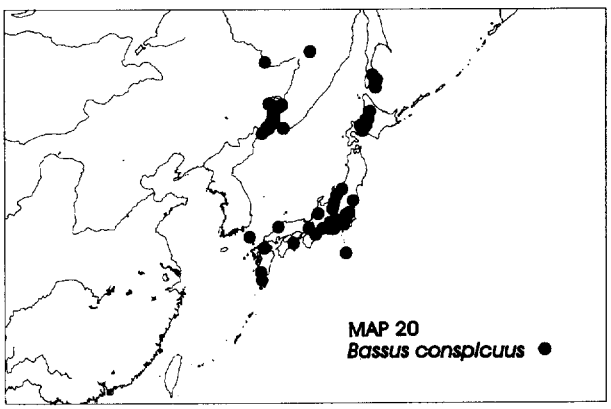
Agathis zonata : LYLE 1920, p. 183.

Bassus variablis CHOU and SHARKEY 1989, pp. 173–174. NEW SYNONYM.

Length. (1) 2.9–5.0 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black or black dorsally and yellowish brown ventrally; (5) foreleg yellow; (6) middle leg yellow; (7) hind coxa yellowish brown or yellowish brown medially and partly black laterally; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in less than distal 1/2; (11) wings clear to weakly infuscate; (12) mesosoma from yellow to black, often yellow and black or yellow and brown, tegula yellow; (13) metasoma black to yellow, usually brown with yellowish brown sterna and yellowish brown between median tergites 1 and 2, rarely median tergite 2 entirely yellowish brown.

Head. (Fig. 2f). (14) Number of flagellomeres=29–35; (15) ratio, OOL : POL=1.9–2.1; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=4.9–5.7; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.



Mesosoma. (Figs. 7 a, b, 11 c). (23) Bump of propleuron weak; (24) notaulus punctate along entire length or punctate anteriorly and smooth posteriorly; (25) posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum present or absent; (27) posterior surface of scutellum smooth; (28) metapleuron rugose in ventral 1/2 and smooth with punctures dorsally; (29) propodeum rugose with pair of longitudinal carinae defining a medial area, and with transverse carina usually present; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity usually (90%) open, without a complete sclerite separating it from metasomal foramen, rarely (10%) closed, with a complete sclerite separating it from metasomal foramen (Fig. 11 c); (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 0–0.1.

Legs. (33) Ratio, hind femur length : hind femur width = 3.1–3.5; (34) spines of foretibia absent; (35) hind tibia with 8–12 spines (Fig. 14 f); (36) basal lobe of tarsal claws present (Fig. 12 d).

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 19 e); (38) basal portion of free distal abscissa of CU vein of hind wing tubular or nebulous (Fig. 26 b).

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.1–1.5; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.8–2.4; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Widespread across the Palaearctic, from Europe to the Russian Far East and Taiwan. Introduced into the eastern U.S.A. and established. See Map 20 for the distribution of Russian Far East and Japanese specimens.

Hosts. Cochylidae : *Phalonidia manniana* (FISCHER von RÖSLERSTAMM, 1839). Pyralidae : *Dipleurina lacustrata* (PANZER, 1804). Tortricidae : *Cydia pomonella* (LINNAEUS, 1758); *Gypnosoma nitidulana* (LIENIG & ZELLER, 1846); *Grapholita molesta* (BUSCK, 1916); *Pammene regiana* (ZELLER, 1849); *Rhopobota ustomaculana* (CURTIS)

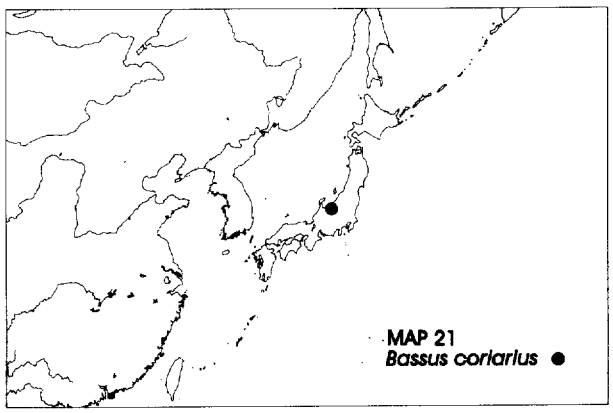
Bassus coriarius NEW SPECIES

(Figure 20 a)

Length. (1) 4.4–5.8 mm.

Color. (2) Flagellomeres yellowish brown or black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellowish orange except coxa black; (6) middle leg yellowish orange except coxa black; (7) hind coxa black; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia present or absent; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black; (13) metasoma black except laterotergites and sterna of segments 1 and 2 somewhat yellowish brown.

Head. (14) Number of flagellomeres = 29–35; (15) ratio, OOL : POL = 1.0–1.2; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 3.7–4.5; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus,



absent; (20) interantennal space variable, raised to converge on single point anteromedially, or flat or with weak median groove separating two very weak ridges and not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum present (cf. Fig. 18a); (27) posterior surface of scutellum granular or rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 1.1.

Legs. (33) Ratio, hind femur length : hind femur width = 3.0–3.4; (34) spines of foretibia absent; (35) hind tibia with 12–16 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing sinuate or weakly curved (Fig. 20a); (38) basal portion of free distal abscissa of CU vein of hind wing tubular.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.1; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.6–2.0; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Remarks. Similar to *B. clausthalianus* (RATZEBURG), but differing most obviously in that the antennal depressions of *B. coriarius* have much weaker margins. The specific name coriarius is Latin for "of leather", and here it refers to the spot of leather-like sculpture between the antennae.

Distribution. Map 21.

Marerial Examined.

Holotype ♀, *Japan* : Nagano : Mt. Arakura, 1300 m, 14. v. 1961 (HAYASAKA) (CNC).

Bassus ebulus (NIXON)

(Figures 2 b, 4 b, 6 a, 6 c, 6 e, 9 a, 11 a, 15 d, 17 a, 20 b)

Agathis ebula NIXON 1950, p. 469.

Bassus ebulus : CHOU and SHARKEY 1989, p. 158-159.

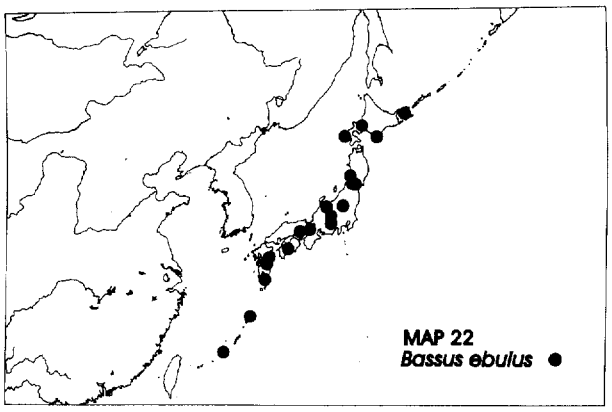
Bassus ater CHOU and SHARKEY 1989, p. 155-156. NEW SYNONYM.

Length. (1) 4.4-7.9 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black or black dorsally, yellowish brown ventrally; (5) foreleg varying from entirely brown or black to mostly brown or black with the following parts yellow or yellowish brown : tarsus, apical 1/2 of femur and base of coxa yellow; (6) middle leg usually entirely black or brown, sometimes tarsus yellow; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia absent; (10) hind tibia entirely black; (11) wings infuscate; (12) mesosoma entirely black or black with orange anterodorsally (pronotum, propleuron, mesoscutum, scutellum and mesopleuron dorsally); (13) metasoma black except sometimes laterotergites and sterna of segments 1 and 2 usually somewhat yellowish brown, though not distinctly so.

Head. (14) Number of flagellomeres = 32-38; (15) ratio, OOL : POL = 1.2-1.8; (16) temple not bulging as viewed dorsally (Fig. 2 b); (17) ratio, malar space : eye height = 3.8-5.3; (18) gena rounded posteroventrally (Fig. 4 b); (19) median ridge between antennae, connecting face and median ocellus, present or absent (ridge usually weakly indicated); (20) interantennal space raised to converge on single point anteromedially (Fig. 2 b); (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron strong (Fig. 9 a); (24) notaulus punctate along entire length or punctate anteriorly and smooth posteriorly (If present, the punctures are large and dispersed, as in most specimens of *B. rufipes*.) (Fig. 6 a); (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum absent; (27) posterior surface of



scutellum rugose (Fig. 6e); (28) metapleuron rugose in ventral 1/3 to 2/3 and smooth with punctures dorsally; (29) propodeum evenly rugose or with rugae more pronounced medially and transverse medial carina sometimes present (Fig. 6c); (30) propodeal pseudosternite with strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 3.8–4.9.

Legs. (33) Ratio, hind femur length : hind femur width = 2.9–3.7; (34) spines of foretibia absent; (35) hind tibia with 12–19 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 20b); (38) basal portion of free distal abscissa of CU vein of hind wing nebulous or spectral.

Metasoma. (Fig. 17a). (39) Pair of longitudinal carinae on median tergite 1 present; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.2–1.7; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate or striogranulate; (43) median tergite 3 striate or striogranulate; (44) ratio, length of ovipositor : length of metasoma = 1.5–2.1; (45) ovipositor sheath not as wide as apex of hind tibia (Fig. 15d) (include setae in measurements).

Host. Tortricidae : *Acroclita notophthalma* MEYRICK, 1933

Remarks. *Bassus ater* was distinguished from *B. ebulus* (CHOU and SHARKEY 1989) primarily on the basis of color differences (mesoscutum); however an examination of more specimens over a greater geographic range shows a gradation in color between the supposed species.

Distribution. Map 22 records the localities of known Japanese specimens. The species also known from Taiwan, the Russian Far East, India, and undoubtedly it is more widespread.

Bassus festivoides NEW SPECIES

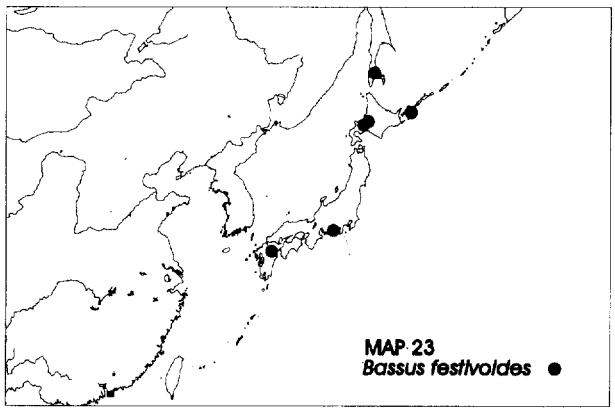
(Figure 20c)

Length. (1) 4.6–7.3 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons, or orbits concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg usually yellow with brown coxa, but varying from yellow to light brown with coxa varying from yellow to black; (6) middle leg usually yellow with brown coxa, but varying from yellow to light brown with coxa varying from yellow to black; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia present; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black, except tegula sometimes (30%) yellow; (13) metasoma mostly black, laterotergites and sterna of segments 1 and 2 yellowish brown but not distinctly nor sharply differentiated.

Head. (14) Number of flagellomeres = 31–37; (15) ratio, OOL : POL = 1.1–1.4; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 4.4–5.2; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length or



punctate anteriorly and smooth posteriorly; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum present; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose, lateral longitudinal carinae rarely (20%) indicated; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 2.1–2.7.

Legs. (33) Ratio, hind femur length : hind femur width = 3.2–3.6; (34) spines of foretibia absent; (35) hind tibia with 6–10 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 20 c); (38) basal portion of free distal abscissa of CU vein of hind wing variable.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.1–1.5; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.9–2.5; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Map 23.

Material Examined.

Holotype ♀, *Japan* : Hokkaido : Mt. Io, Akan National Park, 17. xii. 1955 (MURAKAMI) (KUEC).

Paratypes. *Japan* : Hokkaido : 1 ♀, Bibai, vii.1972 (TAIRA) (NIAS); 2 ♀, same data as preceding except 13–30. vii. 1971 (MOMOI) (NIAS); 2 ♀, Fukuyō, Kanaya, 3. vii. 1955 (MINAMIKAWA) (NIAS); 1 ♀, Mt. Io, Akan National Park, 12. vii. 1955 (MURAKAMI) (KUEC); 1 ♂, Sapporo, 21. vii. 1964 (TAKADA) (EIHU). *Russia* : 1 ♀, 15 km W. of Ozerska Sakhalin, coniferous forest, 12. viii. 1981, (BELOKOBYSKIJ), (ZMAS). 2 ♀, Vlk. Golovnina Kunashir, forest meadow, 28. vii. 1981, (BELOKOBYSKIJ), (ZMAS).

Remarks. The specific name is derived from the Latin *festivus* meaning gay, and the

suffix -oides meaning "like, resembling, having the form of". The species name is an allusion to the similarity, and presumes close phylogenetic affinity between this species and *B. festivus*.

Bassus festivus (MUESEBECK)

(Figs. 4a, 6b, 6d, 6f, 11b, 12e, 17b, 20d, 26a)

Agathis festiva MUESEBECK 1953, p. 149.

Bassus festivus : CHOU and SHARKEY 1989, pp. 159–160.

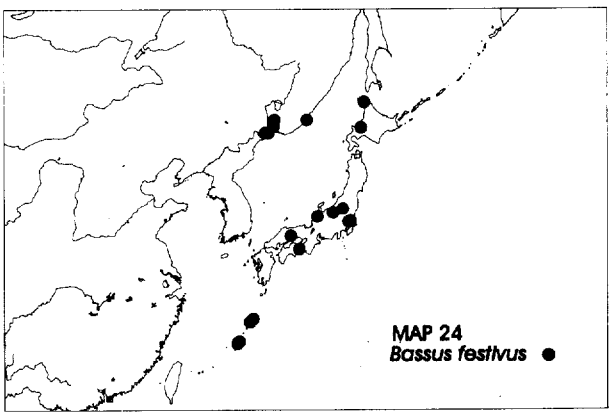
Microdus oranae WATANABE 1970, pp. 123–124. NEW SYNONYM.

Length. (1) 3.0–6.9 mm.

Color. (2) Flagellomeres yellowish brown; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black or black dorsally and yellowish brown ventrally; (5) foreleg usually entirely yellow, rarely (10%) coxa black (most specimens from Okinawa have coxa black and femur black medially); (6) middle leg usually entirely yellow, rarely (10%) coxa black (again most specimens from Okinawa have coxa black and femur black medially); (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia present (Fig. 26a) or absent; (10) hind tibia variable, black in more or less than distal 1/2; (11) wings clear; (12) mesosoma black except tegula often (80%) yellow; (13) metasoma mostly black, laterotergites and sterna of segments 1–2 or 1–3 yellow or yellowish orange, anterior 1/5 to 4/5 of median tergite 2 yellow or yellowish orange.

Head. (14) Number of flagellomeres = 28–34; (15) ratio, OOL : POL = 1.1–1.4; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 3.5–4.3; (18) gena rounded posteroventrally (Fig. 4a); (19) median ridge between antennae, connecting face and median ocellus, present, or absent (ridge usually weakly indicated); (20) interantennal space raised to converge on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutel-



lum present or absent; (27) posterior surface of scutellum smooth or rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose (Fig. 6 d); (30) propodeal pseudosternite without strong transverse carina (Fig. 11 b); (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity 1.5 -2.1.

Legs. (33) Ratio, hind femur length : hind femur width = 3.6-4.0; (34) spines of foretibia present or absent; (35) hind tibia with 5-9 spines; (36) basal lobe of tarsal claws present (Fig. 12 e).

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 20 d); (38) basal portion of free distal abscissa of CU vein of hind wing variable.

Metasoma. (Fig. 17 b). (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.3-1.7; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.4-2.5; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Hosts. Tortricidae : *Adoxophyes orana* (FISCHER Von RÖSLERSTAMM, 1834), *Grapholita molesta* (BUSCK, 1916), *Grapholita prunivora* (WALSH, 1868).

Remarks. As suggested by WATANABE (1970) this species is very close to *Bassus dimidiator* (NEES Von ESENBECK), differing mostly in color characters such as that of the hind femur.

Distribution. Russian Far East, mainland China, Taiwan, India. Introduced to U.S.A. for biological control of *Grapholita molesta*. Map 24 records the distribution of known Japanese and Russian Far East specimens.

Bassus gracilis NEW SPECIES

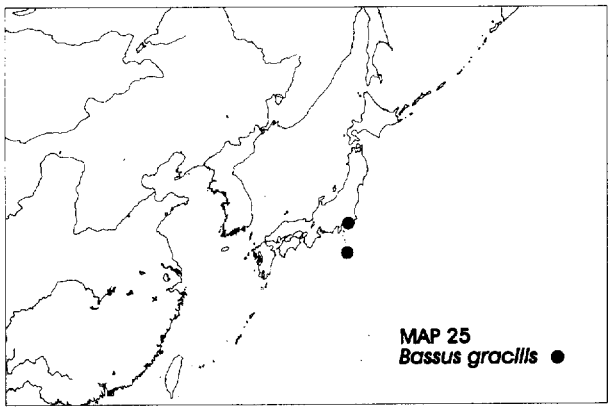
(Fig. 20 e)

Length. (1) 5.3-7.3 mm.

Color. (2) Flagellomeres yellowish brown; (3) orbits of eye, at least in part, paler than temple and/or frons, or concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow; (6) middle leg yellow; (7) hind coxa yellowish brown medially partly black laterally; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma dark brown except tegula yellow; (13) metasoma yellowish orange except median tergite 1 brown.

Head. (14) Number of flagellomeres = 34-40; (15) ratio, OOL : POL = 1.3-1.5; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 3.6-4.0; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25)



posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum absent; (27) posterior surface of scutellum smooth; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum rugose with anterolateral area smooth; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 3.0-4.3.

Legs. (33) Ratio, hind femur length : hind femur width = 2.5-2.9; (34) spines of foretibia present; (35) hind tibia with 8-12 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 20 e); (38) basal portion of free distal abscissa of CU vein of hind wing variable often tubular.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 3.1-3.5; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate or striogranulate; (43) median tergite 3 striate or striogranulate; (44) ratio, length of ovipositor : length of metasoma = 1.7-2.3; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Remarks. This description is based on two specimens, therefore all characters, especially the color characters, likely have greater variation than reported here. The specific name, *gracilis*, is Latin for thin and is a reference to the narrow metasoma of this species.

Distribution. Map 25.

Material Examined.

Holotype ♀, *Japan* : Tokyô : Hachijo Is., Mitsune-Kantoyama, 30. v. 1964 (HIRASHIMA & SHIGA) (KUEC).

Paratype. *Japan* : Chiba : 1 (sex unknown, metasoma broken), Kisarazu, (St. 2), 27. vi. 1976 (KATSUYA) (NIAS).

Bassus inopinatae (TOBIAS) NEW COMBINATION

(Fig. 21 a)

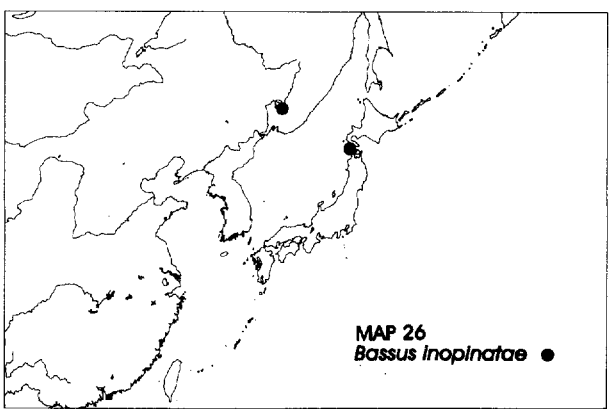
Microdus inopinatae TOBIAS 1976 a, pp. 104-106.

Length. (1) 4.9-7 mm.

Color. (2) Flagellomeres yellowish brown or black; (3) orbits of eye, at least in part, paler than temple and/or frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow; (6) middle leg yellow; (7) hind coxa yellowish brown; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia present; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black except pronotum yellowish orange ventrally and tegula yellow (This is based on the sole specimen known; however, I suppose, based on variation apparent in other species, that the mesosoma may vary from somewhat lighter to entirely black except for a yellow tegula.); (13) metasoma black except laterotergites and sterna of segments 1 and 2 somewhat yellowish brown or brown.

Head. (14) Number of flagellomeres=32-36; (15) ratio, OOL : POL=1.0-1.2; (16) temple bulging as viewed dorsally; (17) ratio, malar space : eye height=3.9; (18) gena forming acute or 90 degree angle posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions deep; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron very strong (ventral surface of bump perpendicular to propleuron proper); (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum present (strong); (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose, with distinct lateral longitudinal carina defining median area; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity=



1.6.

Legs. (33) Ratio, hind femur length : hind femur width=3.1; (34) spines of foretibia absent; (35) hind tibia with 13 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 21a); (38) basal portion of free distal abscissa of CU vein of hind wing spectral.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1=1.2; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 smooth (but variation unknown, striate or striogranulate sculpture possible); (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma=1.8–2.2; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Map 26. Known from the Russian Far East and Japan.

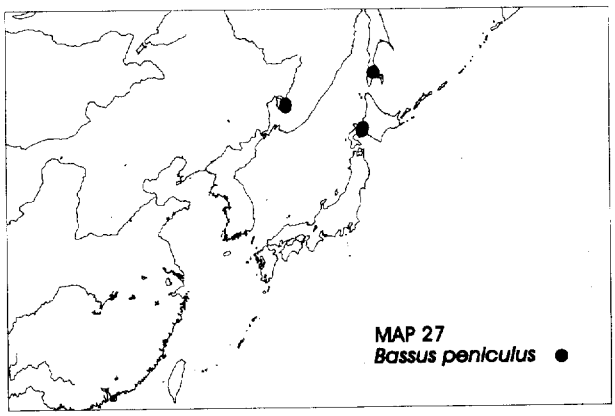
Bassus peniculus NEW SPECIES

(Fig. 21 b)

Length. (1) 5.6–8.1 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow; (6) middle leg yellow; (7) hind coxa yellowish brown; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black except tegula yellow; (13) metasoma black except laterotergites and sterna of segments 1 and 2 somewhat yellowish brown to brown.

Head. (14) Number of flagellomeres=33–39; (15) ratio, OOL : POL=1.2–1.4; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=4.5–5.3; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present (ridge varying from weak to strong); (20) interantennal space raised to converge on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line



between antennae not coriarius.

Mesosoma. (23) Bump of propleuron absent; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum present or absent; (27) posterior surface of scutellum smooth or rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum evenly rugose; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 0.6–1.5.

Legs. (33) Ratio, hind femur length : hind femur width = 4.3–4.8; (34) spines of foretibia absent; (35) hind tibia with 3–7 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 21 b); (38) basal portion of free distal abscissa of CU vein of hind wing tubular.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.4–1.8; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.1–1.7; (45) ovipositor sheath wider than apex of hind tibia (include setae in measurements).

Remarks. The specific name is Latin for little tail or painter's brush and refers to the appearance of the ovipositor sheath with its thick dense setae.

Distribution. Map 27. Known from Japan and the Russian Far East.

Material Examined.

Holotype ♀, *Japan* : Hokkaido : Sapporo, 21. ix. 1966 (KUSIGEMATI) (EIHU).

Paratypes. *Japan* : Hokkaido : 1 ♀, Mt. Soranuma, 23. ix. 1966 (KUSIGEMATI) (EIHU); 1 ♀, Sapporo, 20. ix. 1966 (KUSIGEMATI) (EIHU). *Russia* : 3 ♀, Primorskii Krai Spassk, forest meadow, 19-25.viii.1991 (BELOKOBYLSKIJ), (ZMAS). 2 ♀, Primorskii Krai Spassk, forest, 30. vi. 1985 (BELOKOBYLSKIJ), (ZMAS). 2 ♀, Primorskii Krai Spassk, forest, 10. ix. 1985 and 11. ix. 1988 (BELOKOBYLSKIJ), (ZMAS). 1 ♀, 2 ♂, Sakhallu Is., Novo-Alexandrovsk, Chehov Mountain, 30. vii. 1978 (MAMAEV), (ZMAS).

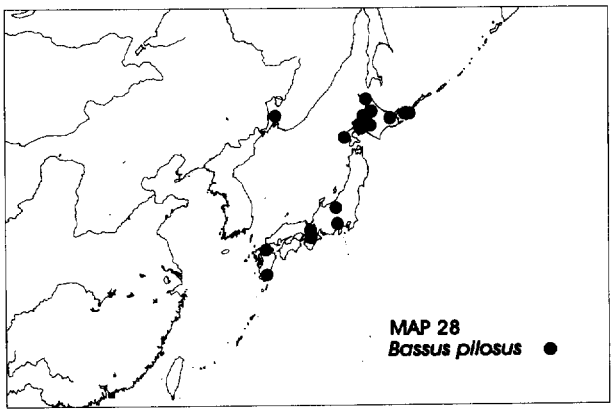
Bassus pilosus (TOBIAS) NEW COMBINATION

(Figs. 2 c, 7 c, 7 d, 12 c, 14 e, 17 d, 21 c)

Microdus pilosus TOBIAS 1976 a, pp. 99–103.

Length. (1) 4.6–6.8 mm.

Color. (2) Flagellomeres yellowish brown or black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow, except coxa yellow to black; (6) middle leg yellow, except coxa yellow to black; (7) hind coxa black; (8) hind femur yellowish brown (orange to light brown); (9) basal black band or spot of hind tibia present; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black except tegula often (60%) yellow; (13) metasoma mostly black, laterotergites and sterna of segments 1 to 3 orange, posterolateral corners of median tergite 3 usually (80%) orange, tergum 4 often (80%) partly orange dorsally.



Head. (14) Number of flagellomeres=32–38; (15) ratio, OOL : POL=1.0–1.5; (16) temple not bulging as viewed dorsally (Fig. 2c); (17) ratio, malar space : eye height=3.7–4.5; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present (Fig. 2c); (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially (Fig. 2c); (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron strong; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum absent (Fig. 7c); (27) posterior surface of scutellum rugose (Fig. 7c); (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) female propodeum rugose with posteromedial area smooth or with weak coriarius microsculpture (Fig. 7d), male propodeum as in female or entirely rugose with pair or lateral longitudinal carina; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity=1.7–2.3.

Legs. (33) Ratio, hind femur length : hind femur width=3.2–3.6; (34) spines of foretibia present or absent; (35) hind tibia with 10–16 spines (Fig. 14e); (36) basal lobe of tarsal claws present (Fig. 12c).

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 21c); (38) basal portion of free distal abscissa of CU vein of hind wing variable.

Metasoma. (Fig. 17d). (39) Pair of longitudinal carinae on median tergite 1 present or absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1=1.4–1.8; (41) median tergite 1 striogranulate; (42) median tergite 2 striogranulate; (43) median tergite 3 striogranulate; (44) ratio, length of ovipositor : length of metasoma=2.2–2.8; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Map 28. Known from the Russian Far East and Japan.

Bassus rufipes (NEES Von ESENBECK)

(Fig. 21 d)

Microdus rufipes NEES Von ESENBECK 1814, p. 189.

Braunsia rufipes : TELENGA 1955, p. 277.

Braunsia germanica ENDERLEIN 1904, p. 436.

Bassus diversus MUESEBECK 1933, p. 48. NEW SYNONYM.

Microdus diversus : BRITTON 1938, p. 189.

Agathis diversus : MUESEBECK and WALKLEY 1951, p. 119.

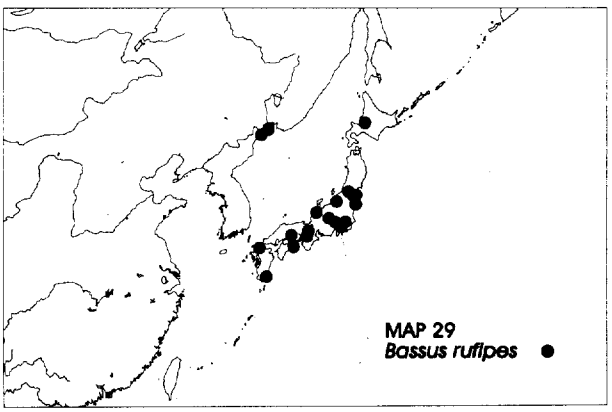
Braunsia diversa : FAHRINGER 1937, p. 483.

Length. (1) 4.4–6.3 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow except coxa variable (yellow to brown); (6) middle leg yellow except coxa variable (yellow to black); (7) hind coxa black; (8) hind femur black, yellowish brown, or yellowish brown and usually (90%) black in basal 1/2 or more, and yellowish brown apically, but rarely almost entirely yellowish brown or black); (9) basal black band or spot of hind tibia present or absent; (10) hind tibia variable, black in more or less than distal 1/2; (12) mesosoma black; (13) metasoma black with laterotergites and sterna usually somewhat more yellowish brown but not distinctly so, apical terga often paler (yellowish brown).

Head. (14) Number of flagellomeres = 28–34; (15) ratio, OOL : POL = 1.3–1.6; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 4.4–5.2; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present or absent (ridge usually weakly indicated); (20) interantennal space raised to converge on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron strong; (24) notaulus punctate along entire length (punctures usually large and dispersed posteriorly); (25) posterior semicircular depression of



scutellum absent; (26) posterior transverse ridge of scutellum absent; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/2 to 2/3 and smooth with punctures dorsally; (29) propodeum evenly rugose; (30) propodeal pseudosternite with strong transverse carina (cf. Fig. 11 a); (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 3.9–4.5.

Legs. (33) Ratio, hind femur length : hind femur width = 2.2–3.1; (34) spines of foretibia present or absent; (35) hind tibia with 15–19 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 21 d); (38) basal portion of free distal abscissa of CU vein of hind wing tubular, nebulous, or spectral.

Metasoma. (cf. Fig. 17 a). (39) Pair of longitudinal carinae on median tergite 1 present; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 0.8–1.2; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate or striogranulate; (43) median tergite 3 striate or striogranulate; (44) ratio, length of ovipositor : length of metasoma = 1.5–2.1; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Hosts. Gelichiidae : *Gelechia nigra* (HAWORTH, 1828); Coleophoridae : *Coleophora gryphipennella* (HÜBNER, 1796); Pieridae : *Gonepteryx rhamni* (LINNAEUS, 1758); Pyralidae : *Acrobasis consociella* (HÜBNER, 1810–13); Tortricidae : *Apotomis capreana* (HÜBNER, 1814–17), *Apotomis semifasciana* (HAWORTH, 1811), *Cacoecimorpha pronubana* (HÜBNER, 1799), *Cydia pomonella* (LINNAEUS, 1758), *Grapholita molesta* (BUSCK, 1916), *Gypsonoma* dealbana (FRÖLICH, 1828), *Gypsonoma oppressana* (TREITSCHKE, 1835), *Gypsonoma sociana* (HAWORTH, 1811), *Hedya dimioalba* (RETZIUS, 1783), *Hedya nubiferana* (HAWORTH), *Rhyacionia buoliana* (DENIS and SCHIFFERMÜLLER, 1775), *Rhopobota ustomaculana* (CURTIS, 1832), *Spilonota ocellana* (DENIS and SCHIFFERMÜLLER, 1775), *Tortrix viridana* LINNAEUS, 1758; Yponomeutidae : *Yponomeuta malinellus* ZELLER, 1838. According to ACHTERBERG (1992) this last record is questionable.

Remarks. The European specimens of *B. rufipes usually* differ in that the coxae are yellowish brown, the hind femur is yellowish brown, and specimens usually don't have enlarged punctures in the region where the notauli meet.

Distribution. Widely distributed in the Palaearctic, from Sweden to Turkey in Europe, and west to Japan in Asia. Introduced into Argentina and U.S.A. Reportedly established in New Jersey (U.S.A.). Map 29 shows the distribution of known Japanese and Russian Far East specimens.

Bassus semistriatus (WALKER) NEW COMBINATION

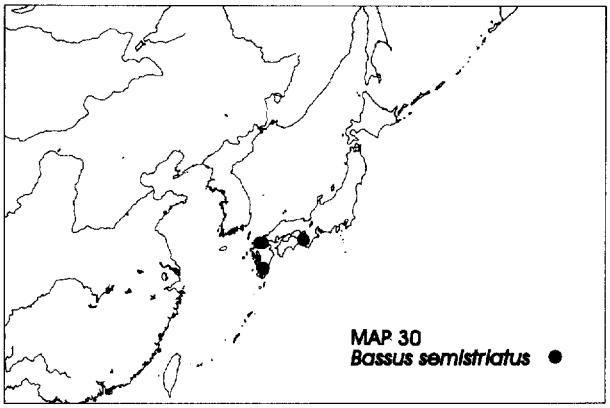
(Figs. 2 e, 4 c, 7 e, 7 f, 9 b, 9 d, 21 e)

Lissonota semistriata WALKER 1874, p. 305.

Agathis semistriata : TOWNES 1961, p. 289.

Length. (1) 5.0–7.5 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons, or concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow except coxa variable, yellow to dark



brown; (6) middle leg yellow except coxa variable, yellow to dark brown; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia present; (10) hind tibia black in less than distal 1/2; (11) wings clear to weakly infuscate; (12) mesosoma black,except tegula usually (90%) yellow; (13) metasoma black except laterotergites and sterna of segments 1 and 2 yellow to orange.

Head. (14) Number of flagellomeres=33–39; (15) ratio, OOL : POL=1.1–1.3; (16) temple bulging as viewed dorsally (Fig. 2e); (17) ratio, malar space : eye height=5.0–5.9; (18) gena forming acute or 90 degree angle posteroventrally (Fig. 4c); (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions deep; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron very strong (ventral surface of bump perpendicular to propleuron proper) (Fig. 9b); (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum present (Fig. 7e); (26) posterior transverse ridge of scutellum present (Fig. 7e); (27) posterior surface of scutellum rugose (Fig. 7e); (28) metapleuron rugose in ventral 1/3 to 1/2 and smooth with punctures dorsally (Figs 7f, 9d); (29) propodeum rugose with lateral longitudinal carina defining a medial area; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity=1.4–2.0.

Legs. (33) Ratio, hind femur length : hind femur width=2.9–3.3; (34) spines of foretibia absent; (35) hind tibia with 10–14 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 21e); (38) basal portion of free distal abscissa of CU vein of hind wing spectral or absent (not connected to cu-a vein).

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1=1.3–1.8; (41) median tergite 1 striate or

striogranulate; (42) median tergite 2 striate or striogranulate; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.5–2.1; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Remarks. Very similar to *Bassus conformis* Bhat and Gupta but differing especially in the shape of the propleural bump.

Distribution. Map 30.

Bassus spatulatus NEW SPECIES

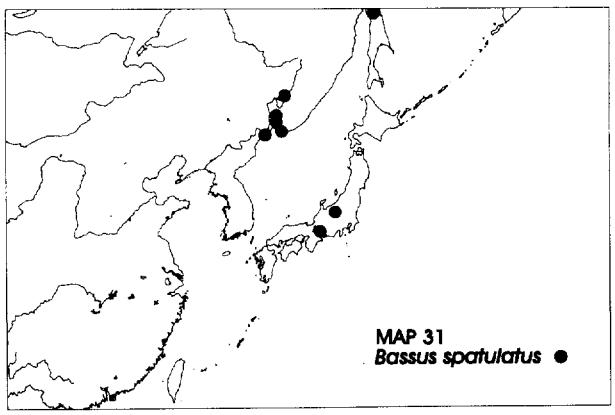
(Figs. 2 d, 4 d, 22 a)

Length. (1) 5–7 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg black basally (coxa, trochanter and base of femur) and distally (tarsus), and yellowish orange medially; (6) middle leg black basally (coxa, trochanter and base of femur) and distally (tarsus), and yellowish orange medially; (7) hind coxa black; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in less than distal 1/2; (11) wings infuscate; (12) mesosoma black; (13) metasoma black, somewhat yellowish brown ventrally.

Head. (14) Number of flagellomeres = 25–29; (15) ratio, OOL : POL = 1.0–1.4; (16) temple not bulging as viewed dorsally (Fig. 2 d); (17) ratio, malar space : eye height = 5.7–6.5; (18) gena rounded posteroventrally (Fig. 4 d); (19) median ridge between antennae, connecting face and median ocellus, absent (Fig. 2 d); (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum absent; (27) posterior surface of scutellum smooth; (28) metapleuron rugose in ventral 1/3 to 1/2 and smooth with punctures dorsally; (29) propodeum evenly rugose with median



area weakly defined laterally by longitudinal carinae and sometimes posteriorly by transverse carina; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 1.0–1.6.

Legs. (33) Ratio, hind femur length : hind femur width = 2.9–3.3; (34) spines of foretibia absent; (35) hind tibia with 6–10 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 22 a); (38) basal portion of free distal abscissa of CU vein of hind wing tubular.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent (or sometimes weakly indicated); (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.2–2.0; (41) median tergite 1 striate; (42) median tergite 2 smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 2.5–3.1; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Remarks. The specific name is a composite of the Latin words for spoon (*spatula*) and likeness (-atus). It refers to the large spoon-like hypopygium of this species.

Distribution. Map 31. Known from Japan and the Russian Far East.

Material Examined.

Holotype ♀, *Japan* : Gifu : Ibigawa River., Baruryu-san, 29. v. 1984, (BACZYNSKI), (NIAS).

Paratypes. *Japan* : Nagano : 2 ♀, Sugadaira, 14–18. viii. 1965 (KATSUYA) (NIAS). *Russia* : 1 ♂, P.T. Khorol' District, Blagodatnoe, flowers of umbellifera, 6. vii. 1981 (MUTIN), (ZMAS). 1 ♀, P.T., Khasan, 14. vii. 1976 (KURZENKO), (ZMAS). 1 ♀, P.T., Tavrichanka, shrubs, 26. viii. 1978 (BELOKOBYLSKIJ), (ZMAS). 1 ♂, Timovskoe, Sakhalin, mixed forest, 4. vii. 1981 (BELOKOBYLSKIJ), (ZMAS). 2 ♂, 1 , P.T. Mihaylovka District, Tarasovka, barley with soya, 7–12. viii. 1973 (KULIKOVA), (ZMAS). 2 ♀, 1 ♂, Primorskii Krai, Khasan, Golubinyi, Utes, oak forest with bushes, 20–27. viii. 1988 (BELOKOBYLSKIJ), (ZMAS).

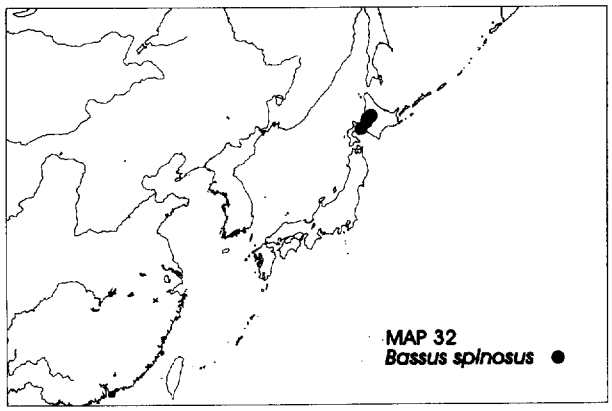
Bassus spinosus NEW SPECIES

(Fig. 22 b)

Length. (1) 5.6–8.1 mm.

Color. (2) Flagellomeres black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg usually yellowish brown with dark brown coxa, but varying from yellow to dark brown with coxa varying from yellow to black; (6) middle leg usually yellowish brown with dark brown coxa, but varying from yellow to dark brown with coxa varying from yellow to black; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia absent; (10) hind tibia entirely black; (11) wings weakly infuscate; (12) mesosoma black; (13) metasoma almost entirely black except for somewhat yellowish brown sterna on segments 1 and 2.

Head. (14) Number of flagellomeres = 35–41; (15) ratio, OOL : POL = 0.9–1.1; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height = 4.2–5.0; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences,



not converging on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length or punctate anteriorly and smooth posteriorly; (25) posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum present; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum rugose with distinct lateral longitudinal carinae defining medial area; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity = 1.6-2.2.

Legs. (33) Ratio, hind femur length : hind femur width = 3.7-4.4; (34) spines of foretibia present (cf. Fig. 14 a); (35) hind tibia with 4-8 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 22 b); (38) basal portion of free distal abscissa of CU vein of hind wing tubular or nebulous.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.3-1.7; (41) median tergite 1 striate or smooth (or mostly smooth with striae laterally); (42) median tergite 2 striate or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 2.6-3.6; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Host. Tortricidae : *Pseudohermenias clausthaliana* (SAXESEN, 1840).

Remarks. The specific name is Latin for thorny and refers to the spines on the foretibia.

Distribution. Map 32.

Material Examined.

Holotype ♀, *Japan* : Hokkaido : Asahigawa, v. 1969 (KAMIJO) (NIAS).

Paratypes. *Japan* : Hokkaido : 7 , 2 ♂, Asahigawa, various dates from 26. v. 1965 to 10. v. 1972 (KAMIJO) (NIAS); 1 ♂, Bibai, 17. v. 1968 (KAMIJO) (NIAS); 1 ♂, 1 ♀, Mt. Eniwa, 1. vii. 1966 (KUSIGEMATI) (EIHU).

Bassus striogranulatus NEW SPECIES

(Fig. 22 c)

Length. (1) 3–5 mm.

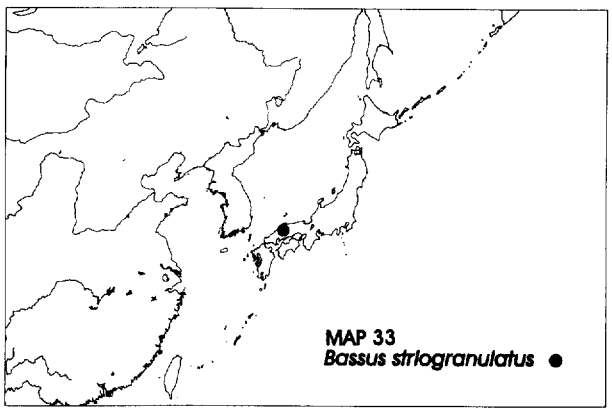
Color. (2) Flagellomeres yellowish brown or black; (3) orbits of eye concolorous with temple and frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellow except coxa black; (6) middle leg yellow except coxa black; (7) hind coxa black; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia present; (10) hind tibia black in less than distal 1/2; (11) wings clear; (12) mesosoma black except tegula yellowish brown; (13) metasoma black except laterotergites and sterna of segments 1–2 yellowish brown though not sharply differentiated from remainder of metasoma.

Head. (14) Number of flagellomeres=28–34; (15) ratio, OOL : POL=1.2–1.5; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=3.2–4.0; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present; (20) interantennal space raised to converge on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum absent; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum rugose medially, smooth with coriarius sculpture laterally; (30) propodeal pseudosternite with strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity= 1.4–2.0.

Legs. (33) Ratio, hind femur length : hind femur width=3.0–3.4; (34) spines of foretibia absent; (35) hind tibia with 6–10 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 22 c); (38)



basal portion of free distal abscissa of CU vein of hind wing spectral.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 present; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.1–1.5; (41) median tergite 1 striogranulate; (42) median tergite 2 striogranulate; (43) median tergite 3 striogranulate; (44) ratio, length of ovipositor : length of metasoma = 1.5–2.1; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Remarks. The specific name is a composite from the Latin words for furrow and grain-like and refers to the sculpture of median tergites 1–3.

Distribution. Map 33.

Material Examined.

Holotype ♀, *Japan* : Hiroshima : Mt. Azuma, north of Hiwa, 13. viii. 1976 (MAETÔ) (EIHU).

Bassus tumidulus (NEES von ESENBECK)

(Figs. 2 a, 19 b)

Microdus tumidulus NEES von ESENBECK 1814, p. 189.

Bassus tumidulus : THOMPSON, 1953, p. 96.

Agathis tumidula : SHENEFELT, 1970, p. 362–363.

Microdus annae ENDERLEIN, 1908, p. 223.

Agathis annae : SHENENFELT, 1970, p. 316.

Microdus tumidulus var. *ruficoxis* FAHRINGER, 1937, p. 509.

Agathis tumidula var. *ruficoxis* : SHENEFELT, 1970, p. 363.

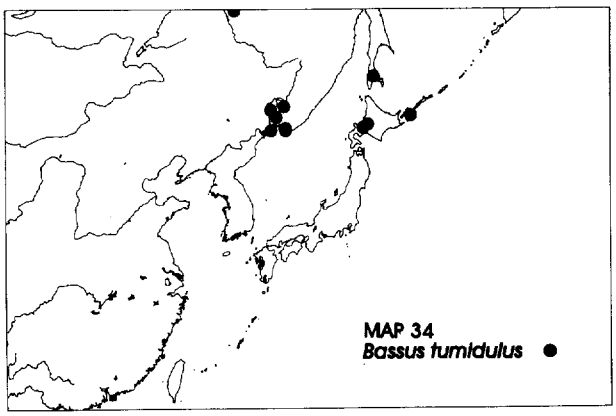
Microdus aino WATANABE 1937, p. 92. NEW SYNONYM.

Microdus bicolor SHESTAKOV 1940, p. 15 (Preoccupied in *Microdus* by PROVANCHER, 1880).

Microdus victoris TELENGA, 1955, p. 288.

Agathis victoris : SHENEFELT, 1970, p. 366.

Agathis shestakovi SHENEFELT 1970, p. 355. (Replacement name for *M. bicolor* SHESTAKOV). NEW SYNONYM.



Microdus anuphrievi TOBIAS 1986, p. 288.

Length. (1) 5.6–8.1 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons; (4) mouthparts yellow or yellowish brown, remainder of head entirely black; (5) foreleg yellowish orange; (6) middle leg yellowish orange; (7) hind coxa yellowish brown; (8) hind femur yellowish brown; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in less than distal 1/2; (11) wings clear to lightly infuscate; (12) mesosoma black except tegula yellowish brown; (13) metasoma from almost entirely black, except for somewhat yellowish brown laterotergites and sterna on segments 1 and 2, to mostly orange except for black posterior to tergum 3.

Head. (Fig. 2a) (14) Number of flagellomeres=33–39; (15) ratio, OOL : POL=1.2–1.4; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=4.1–4.9; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, absent; (20) interantennal space flat or with weak median groove separating two prominences, not converging on single point anteromedially; (21) antennal depressions deep; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron weak or strong; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum present; (26) posterior transverse ridge of scutellum present; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3, smooth with punctures dorsally; (29) propodeum rugose with lateral longitudinal carinae defining medial area; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind coxal cavity and metasomal foramen : diameter of hind coxal cavity=1.7–2.3.

Legs. (33) Ratio, hind femur length : hind femur width=3.2–3.6; (34) spines of foretibia present (cf. Fig. 14a); (35) hind tibia with 7–11 spines; (36) basal lobe of tarsal claws present.

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 19b); (38) basal portion of free distal abscissa of CU vein of hind wing tubular or nebulous.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1=0.9–1.4; (41) median tergite 1 mostly smooth with a few striae laterally; (42) median tergite 2 smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma=1.9–2.3; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Widespread throughout most of Europe and temperate Asia. Map 34 show distribution in Japan and Russian Far East.

Hosts. According to Achterberg (1992).

Tortricidae :

Cydia tenebrosana (DUPONCHE) on *Rosa*; *Dichrorhampha acuminatana* (LIENIG & ZELLER) on *Chrysanthemum leucanthemum* LINNAEUS; *Epiblema scutellana* (DENIS and SCHIFFERMÜLER) on *Cirsium*; *Epiblema cirsiana* (ZELLER) on *Centaurea nigra* LINNAEUS; and *Lathronympha strigata* (FABRICIUS) on *Hypericum*.

Bassus ussuriensis (TELENGA) NEW COMBINATION

(Figs. 12f, 14a, 14b, 14c, 14d, 22d)

Microdus ussuriensis TELENGA 1933, p. 246.

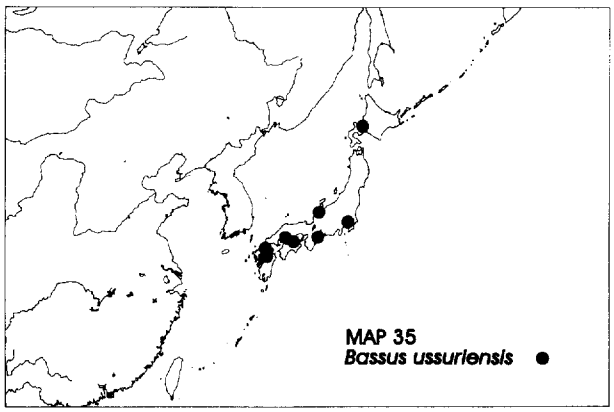
Agathis ussuriensis : SHENEFELT 1970, p. 365.

Length. (1) 5.0-8.7 mm.

Color. (2) Flagellomeres black; (3) orbits of eye, at least in part, paler than temple and/or frons (check dorsal orbit); (4) mouthparts yellow or yellowish brown, remainder of head entirely black or black dorsally and yellowish brown ventrally; (5) foreleg yellowish brown to dark brown, darker basally; (6) middle leg yellowish brown to dark brown, darker basally, often base of tibia distinctly lighter than remainder; (7) hind coxa black; (8) hind femur black; (9) basal black band or spot of hind tibia absent; (10) hind tibia black in more than distal 1/2; (11) wings weakly infuscate; (12) mesosoma black; (13) metasoma black, with laterotergites and sterna of segments 1 and 2 yellowish white, and often with apex of median tergite 1 and base of median tergite 2 yellowish brown (yellow to yellowish brown).

Head. (14) Number of flagellomeres=33-39; (15) ratio, OOL : POL=1.6-2.0; (16) temple not bulging as viewed dorsally; (17) ratio, malar space : eye height=4.9-5.7; (18) gena rounded posteroventrally; (19) median ridge between antennae, connecting face and median ocellus, present; (20) interantennal space raised to converge on single point anteromedially; (21) antennal depressions shallow; (22) sculpture on median line between antennae not coriarius.

Mesosoma. (23) Bump of propleuron absent or weak; (24) notaulus punctate along entire length; (25) posterior semicircular depression of scutellum absent; (26) posterior transverse ridge of scutellum present or absent; (27) posterior surface of scutellum rugose; (28) metapleuron rugose in ventral 1/3 to 1/2 and smooth with punctures dorsally; (29) propodeum rugose, rugosities sometimes (50%) more pronounced and spaced further apart medially; (30) propodeal pseudosternite without strong transverse carina; (31) hind coxal cavity closed, with a complete sclerite separating it from metasomal foramen; (32) ratio, distance between hind



coxal cavity and metasomal foramen : diameter of hind coxal cavity = 1.6–2.6.

Legs. (33) Ratio, hind femur length : hind femur width = 3.6–4.0; (34) spines of foretibia present (Figs 14 a, b); (35) hind tibia with 5–9 spines (Fig. 14 d); (36) basal lobe of tarsal claws absent, claws simple (Fig. 12 f).

Wings. (37) Last abscissa of RS vein of forewing straight or weakly curved (Fig. 22 d); (38) basal portion of free distal abscissa of CU vein of hind wing spectral or absent.

Metasoma. (39) Pair of longitudinal carinae on median tergite 1 absent; (40) ratio, length of median tergite 1 : apical width of median tergite 1 = 1.2–1.6; (41) median tergite 1 striate or striogranulate; (42) median tergite 2 striate, striogranulate, or smooth; (43) median tergite 3 smooth; (44) ratio, length of ovipositor : length of metasoma = 1.9–2.5; (45) ovipositor sheath not as wide as apex of hind tibia (include setae in measurements).

Distribution. Siberia, Russian Far East, and Japan. Map 35 records the localities of the known Japanese specimens.

Braunsia KRIECHBAUMER 1894

Braunsia KRIECHBAUMER 1894. p. 63. Type species : *Braunsia bicolor* KRIECHBAUMER. Designated by VIERECK (1914).

Key to Japanese Species of *Braunsia*

1	Stigma partly yellow	2
–	Stigma without yellow color	3
2 (1)	Median tergite 1 striate (at least in posterior 1/2) (Fig. 16 f)	*Braunsia matsumurai* WATANABE
–	Median tergite 1 smooth or with weak striae restricted to apex	*Braunsia postfurcalis* WATANABE
3 (1)	Hind femur brownish black or black	*Braunsia pilosa* BELOKOBYLSKIJ
–	Hind femur reddish brown	*Braunsia antefurcalis* WATANABE

Character List For *Braunsia* Species

1. body length (excluding ovipositor) in mm.
2. color.
3. wing color.
4. hind femur color.
5. stigma color.
6. number of flagellomeres.
7. ratio, OOL : POL. OOL = distance between lateral ocellus and compound eye. POL = distance between lateral ocelli.
8. ratio, OOL : posterior ocellus diameter.
9. notaulus.

1. present.
2. absent.

#10. propodeum sculpture.
#11. ratio, hind femur length : hind femur width.
#12. forewing vein 1cu-a.
1. antefurcal with respect to vein 1-M.
2. postfurcal with respect to vein 1-M (Fig. 23 b)
3. interstitial (Fig. 23 c).

#13. number of hamuli.
#14. sculpture of median tergite 1.
#15. ratio, median tergite 2 length : width.
#16. ovipositor sheath width.
#17. ratio, length of ovipositor : length of metasoma.

Species Descriptions of Japanese *Braunsia*

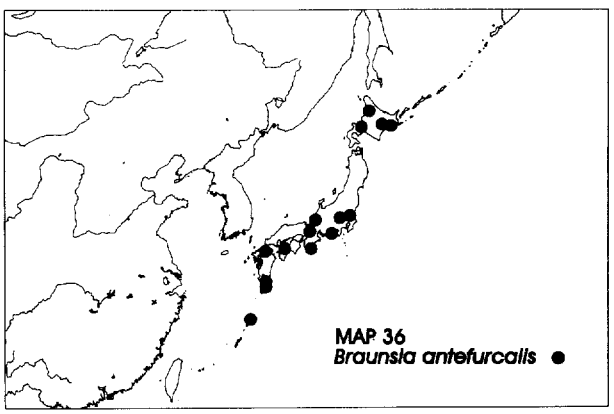
Braunsia antefurcalis WATANABE
(Figs. 16 e, 22 e)

Braunsia antifurcalis WATANABE 1937. pp. 90-91.
Braunsia graciliventris BELOKOBYLSKIJ 1989. pp. 70-72. NEW SYNONYM.

Length. (1) 7.5-13 mm.

Color. (2) Mostly reddish brown and black, reddish brown except as follows : head black except gena pale, body of mesosoma black, terga from reddish brown to black; (3) forewing infuscate; (4) hind femur reddish brown; (5) stigma without yellow color.

Structure. (6) Number of flagellomeres=40-48; (7) ratio, OOL : POL=1.4-1.8; (8) ratio, OOL : posterior ocellus diameter=2.4-2.8; (9) notaulus present; (10) propodeum mostly rugose, median areolae and anterior transverse carina often discernable; (11) ratio, hind femur length :



hind femur width=5.5–5.9; (12) forewing vein 1cu-a antefurcal or interstitial with respect to vein 1-M (Fig. 22e); (13) hamuli 6–10; (14) median tergite 1 striate (at least in posterior 1/2), or smooth or with weak striae restricted to apex (Fig. 16e); (15) ratio, median tergite 2 length : width=1.8–2.4; (16) ovipositor sheath wider (at widest point) than width of apex of middle tibia; (17) ratio, length of ovipositor : length of metasoma=1.2–1.5.

Remarks. Braunsia *graciliventris* BELOKOBYLSKIJ is here considered a junior synonym of *Braunsia antefurcalis*. The character states used by BELOKOBYLSKIJ (1989) to separate the two species (metasomal color and metasomal dimensions) show a gradation when Japanese specimens are considered. I have seen a number of specimens that are intermediate between the two species as they are defined by BELOKOBYLSKIJ (1989).

Distribution : Map 36 records the distribution of known Japanese specimens. The species also occurs in the Russian Far East (BEKOKOBYLSKIJ, 1989).

Braunsia matsumurai WATANABE

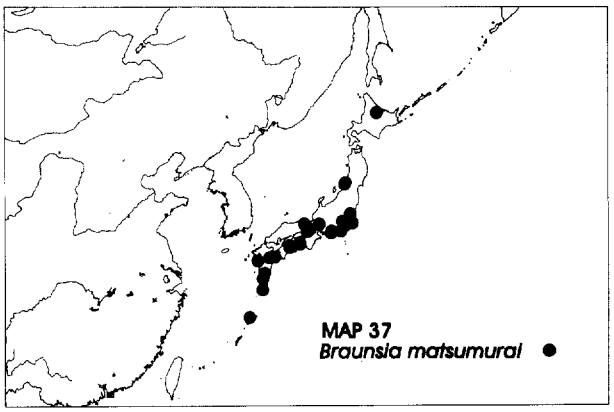
(Figs. 1, 16f, 23b)

Braunsia matsumurai WATANABE 1937, p. 89.

Length. (1) 9.4–13.8 mm.

Color. (2) Usually entirely dull yellow or yellowish orange except brown flagellum and sometimes hind tibia and tarsus and metasoma brown to black; (3) forewing yellow except infuscate band basad stigma and infuscate distad stigma (Fig. 23b); (4) hind femur yellowish orange; (5) stigma partly yellow.

Structure. See figure. 1 for drawing of lateral habitus. (6) Number of flagellomeres=39–47; (7) ratio, OOL : POL=2.2–2.6; (8) ratio, OOL : posterior ocellus diameter=2.6–3.0; (9) notaulus present; (10) propodeum with well defined median posterior areola and anterior transverse carina, otherwise smooth, rarely almost entirely smooth with weak carinae barely indicated; (11) ratio, hind femur length : hind femur width=4.6–5.4; (12) forewing vein 1cu-a postfurcal with respect to vein 1-M (Fig. 23b); (13) hamuli 6–14; (14) median tergite 1 striate (at least in



posterior 1/2) (Fig. 16f); (15) ratio, median tergite 2 length : width=1.7–2.3; (16) ovipositor sheath narrower (at widest point) than width of apex of middle tibia; (17) ratio, length of ovipositor : length of metasoma=1.3–1.7.

Distribution : Map 37 records the localities of the known Japanese specimens. The species also occurs in the Russian Far East (see BELOKOBYLSKIJ, 1989).

Braunsia pilosa BELOKOBYLSKIJ

(Fig. 23c)

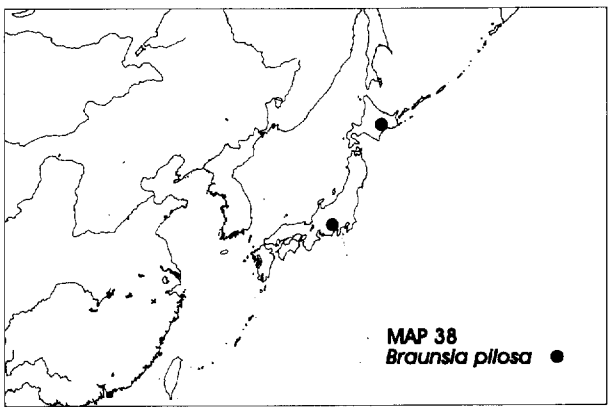
Braunsia pilosa BELOKOBYSKIJ 1986, pp. 33–35.

Length. (1) 8.5–13 mm.

Color. (2) Black except as follows : foreleg distad coxa, middle leg distad midlength of femur and hind leg distad femur, all yellow or brownish yellow; (3) forewing infuscate; (4) hind femur brownish black or black; (5) stigma without yellow color.

Structure. (6) Number of flagellomeres=42–48; (7) ratio, OOL : POL=1.6–1.9; (8) ratio, OOL : posterior ocellus diameter=2.1–2.5; (9) notaulus present; (10) propodeum usually mostly rugose, often with posterior and anterior areola and anterior and posterior transverse carina present; (11) ratio, hind femur length : hind femur width=5.2–6.0; (12) forewing vein 1cu-a antefurcal with respect to vein 1-M, or interstitial (Fig. 23c); (13) hamuli 6–12; (14) median tergite 1 smooth or with weak striae restricted to apex; (15) ratio, median tergite 2 length : width=1.9–2.4; (16) ovipositor sheath wider (at widest point) than width of apex of middle tibia; (17) ratio, length of ovipositor : length of metasoma=1.4–1.7.

Distribution : Map 38 records the localities of the known Japanese specimens. The species also occurs in the Russian Far East (see BELOKOBYLSKIJ 1986, 1989).



Braunsia postfurcalis WATANABE

(Fig. 23 d)

Braunsia postfurcalis WATANABE 1937. pp. 88–89.

Length. (1) 9.0–11.3 mm.

Color. (2) Mostly reddish brown except as follows, head may be almost all yellow, gena contrastingly pale if head reddish brown, fore and middle legs and hind leg distad femur all yellowish brown, terga from reddish brown to mostly black. (3) Forewing infuscate with a yellowish tinge especially basally; (4) hind femur yellowish orange; (5) stigma with yellow color.

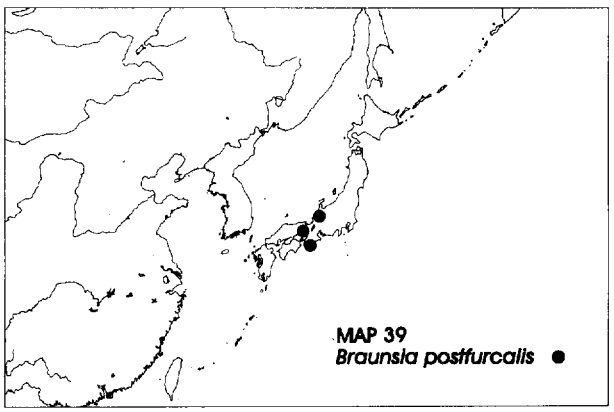
Structure. (6) Number of flagellomeres = 40–48; (7) ratio, OOL : POL = 1.3–1.7; (8) ratio, OOL : posterior ocellus diameter = 1.7–2.1; (9) notaulus present; (10) propodeum mostly smooth, with weak anterior transverse groove and rugae anteromedially; (11) ratio, hind femur length : hind femur width = 5.0–5.4; (12) forewing vein 1cu-a postfurcal with respect to vein 1-M (Fig. 23 d); (13) hamuli 6–10; (14) median tergite 1 smooth or with weak striae restricted to apex; (15) ratio, median tergite 2 length : width ratio = 2.3–3.0; (16) ovipositor sheath about as wide (at widest point) as width of apex of middle tibia; (17) ratio, length of ovipositor : length of metasoma = 1.9–2.4.

Distribution : Map 39 records the localities of the known Japanese specimens. The species also occurs in the Russian Far East (see BELOKOBYLSKIJ, 1989).

Laccagathis WATANABE 1934

Laccagathis WATANABE 1934 a, Type species : *Laccagathis formosana* WATANABE. By original designation.

Remark. The recognition of *Laccagathis* probably renders *Braunsia* paraphyletic. I know of no autapomorphic character states that define *Braunsia* without including members of *Laccagathis*, however it is beyond the scope of this paper to analyze generic relationships.



Laccagathis japonica WATANABE

(Fig. 23 a)

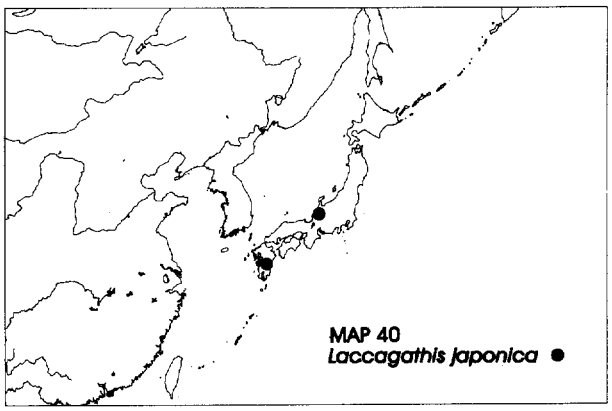
Laccagathis japonica WATANABE 1934 a, p.123.

Length. 11-14 mm.

Color. Mesosoma and head orange except flagellum and hind leg brown, metasoma pale ventrally, orange to black dorsally; forewing yellow except infuscate band at level of parastigma and infuscate distad stigma; hind femur brownish black or black; stigma partly yellow.

Structure. Number of flagellomeres=48-56; ratio, OOL : POL=2.0-2.3; ratio, OOL : posterior ocellus diameter=2.2-2.6; notaulus absent; propodeum with well defined median posterior areola, otherwise smooth with several weak rugae, anterior transverse carina sometimes weakly indicated; ratio, hind femur length : hind femur width=3.5-3.8; forewing vein 1cu-a postfurcal with respect to vein 1-M (Fig. 23a); hamuli 10-20; median tergite 1 striate (at least in posterior 1/2); median tergite 2 length : width ratio=1.0-1.4; ovipositor sheath narrower (at widest point) than width of apex of middle tibia; ratio, length of ovipositor : length of metasoma=0.9-1.3.

Distribution. Map 40.



Check List of Japanese Agathidinae

Agathidini

Eumicrodini

Cremnoptini

Disophrini

Earinini

Host List

***Agathis maetoi* n. sp.**

Tortricidae on Rhododendron aureum

***Agathis pumila* RATZEBURG**

Argyresthiidae

Argyresthia laricella KEARFOTT, 1908

Coleophoridae

Coleophora laricella (HÜBNER, 1814–17)

***Aneurobracon philippinensis* MUESEBECK**

Gracillariidae

Acrocercops transecta MEYRICK, 1931

Spulerina dissotoma (MEYRICK, 1931) (new host record)

***Bassus cingulipes* (NEES von ESENBECK)**

Cochylidae

Aethes francillana (FABRICIUS, 1794)

Phalonidia curvistrigana (STAINTON, 1859)

Coleophoridae

Coleophora follicolaris (VALLOT, 1802)

Coleophora sp.

Epermeniidae

Epermenia aequidentella (HOFMANN, 1867)

Gelechiidae

Aproaerema anthyllidella (HÜBNER, 1810–13)

Metzneria aestivella (ZELLER, 1839)

Geometridae

Eupithecia intricata millieraria (WNUKOWSKY, 1929)

Tortricidae

Tortrix viridana LINNAEUS, 1758

***Bassus conspicuus* (WESMAEL)**

Cochylidae

Phalonidia manniana (Fischer von RÖSLERSTAMM, 1839)

Pyralidae

Dipleurina lacustrata (PANZER, 1804)

Tortricidae

Cydia pomonella (LINNAEUS, 1758)

Gypnosoma nitidulana (LIENIG & ZELLER, 1846)

Grapholita molesta (BUSCK, 1916)

Pammene regiana (ZELLER, 1849)

Rhopobota ustomaculana (CURTIS)

***Bassus ebulus* (NIXON)**

Tortricidae

Acroclita notophthalma MEYRICK, 1933

Bassus festivus **(MUESEBECK)**

Tortricidae

Adoxophyes orana (FISCHER von RÖSLERSTAMM, 1834)

Grapholita molesta (BUSCK, 1916)

Grapholita prunivora (WALSH, 1868)

Bassus rufipes **(NEES von ESENBECK)**

Coleophoridae

Coleophora gryphipennella (HÜBNER, 1796)

Gelechiidae

Gelechia nigra (HAWORTH, 1828)

Pieridae

Gonepteryx rhamni rhamni (LINNAEUS, 1758)

Pyralidae

Acrobasis consociella (HÜBNER, 1810–13)

Tortricidae

Apotomis capreana (HÜBNER, 1814–17)

Apotomis semifasciana (HAWORTH, 1811)

Cacoecimorpha pronubana (HÜBNER, 1799)

Cydia pomonella (LINNAEUS, 1758)

Grapholita molesta (BUSCK, 1916)

Gypsonoma dealbana (FRÖLICH, 1828)

Gypsonoma oppressana (TREITSCHKE, 1835)

Gypsonoma sociana (HAWORTH, 1811)

Hedya dimidioalba (RETZIUS, 1783)

Hedya nubiferana (HAWORTH)

Rhyacionia buoliana (DENIS and SCHIFFERMÜLLER, 1775)

Rhopobota ustomaculana (CURTIS, 1832)

Spilonota ocellana (DENIS and SCHIFFERMÜLLER, 1775)

Tortrix viridana LINNAEUS, 1758

Yponomeutidae

Yponomeuta malinellus ZELLER, 1838

Bassus spinosus **n. sp.**

Tortricidae

Pseudohermenias clausthaliana (SAXESEN, 1840)

Bassus tumidulus **(NEES von ESENBECK)**

Tortricidae

Dichrorhampha acuminatana (Lienig & Zeller) on *Chrysanthemum leucanthemum* Linnaeus

Lathronympha strigata (FABRICIUS) on *Hypericum*

Epiblema scutellana (DENIS and SCHIFFERMÜLLER) on *Cirsium*

Epiblema cirsiana (ZELLER) on *Centaurea nigra* LINNAEUS

Cydia tenebrosana (DUPONCHEL) on *Rosa.*

Cremnops desertor **(LINNAEUS)**

Pyralidae

Eurrhypara hortulata (LINNAEUS, 1758)

Eutectona machoeralis (WALKER, 1859)

Ostrinia nubilalis (HÜBNER, 1796)

Sitochroa verticalis (LINNAEUS, 1758)

Sesiidae

Synanthedon spheciformis (DENIS & SCHIFFERMÜLLER, 1775)

Tortricidae

Cydia pomonella (LINNAEUS, 1758)

Earinus elator **(FABRICIUS)**

Noctuidae

Agrochola circellaris (HUFNAGEL, 1766)

Agrochola lota CLERCK (1759) on *Salix caprea.*

Atethmia centrago (HAWORTH, 1809)

Earinus jezoensis **WATANABE**

Tortricidae

Zeiraphera rufimitrana truncata OKU, 1968, new host record.

Euagathis japonica **SZÉPLIGETI**

Lymantriidae

Euproctis fraterna (MOORE, 1882)

Euproctis guttata (WALKER, 1855)

Arctiidae

unknown arctiid larva (Bhat and Gupta 1977)

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日本産タテスジコマユバチ亜科の再検討[1]
(ハチ目：コマユバチ科)

マイケル・ジョセフ・シャーキー[2]

摘　要

タテスジコマユバチ亜科（ハチ目：コマユバチ科）は世界から約1,000種が知られており，さらにその数倍に及ぶ未記載種が存在すると考えられる。これまで知られているタテスジコマユバチ亜科の種はすべて鱗翅目幼虫の内部寄生蜂で，寄主の発育を許したまま寄生するタイプ（koinobiont）である。寄主となる鱗翅目幼虫の約20%は自由生活型で通常夜行性であるが，他のものは葉を巻いてその内部に生息したり，植物の茎内に潜入するものである。この亜科の蜂は普通，卵を寄主の初齢幼虫か2齢幼虫に産み付けるが，*Cremnops*属の蜂は3齢以降の幼虫に産卵する。成虫は寄主幼虫が終齢に達して営繭した後に羽化する。

日本産タテスジコマユバチ亜科の従来の記録は16種であったが，本研究で属及び種の再検討を行った結果，8属41種となり，それらの検索表を作成した。そのうち新種として，*Agathis asternaulus, Agathis kumatai, Agathis maetoi, Agathis watanabei, Bassus coriarius, Bassus festivoides, Bassus gracilis, Bassus peniculis, Bassus spatulatus, Bassus spinosus, Bassus striogranulatus, Coccygidium nihonense, Coccygidium ruidum, Cremnops pappi* 及び *Earinus longensis* の15種が記載された。

[1] 本研究は，平成元年度STAフェローとして農業環境技術研究所で行った研究を取り纏めたものである。

[2] カナダ農業食糧省国土生物資源研究センター生物資源部
現在　ケンタッキー大学農学部昆虫学研究室

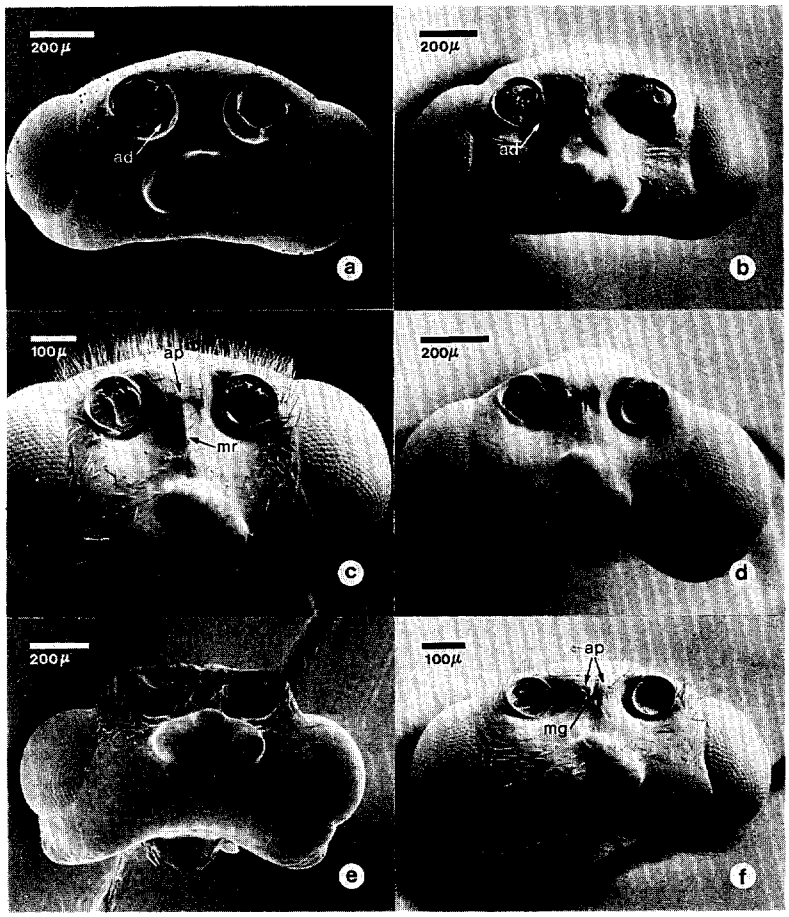


Fig. 2. a. *Bassus tumidulus*, dorsal aspect of head, ad=antennal depression.
b. *Bassus ebulus*, dorsal aspect of head, ad=antennal depression.
c. *Bassus pilosus*, dorsal aspect of head, ap=anterior point, mr=median ridge.
d. *Bassus spatulatus*, dorsal aspect of head.
e. *Bassus semistriatus*, dorsal aspect of head.
f. *Bassus conspicuus*, dorsal aspect of head, ap=anterior point, mg=median groove.

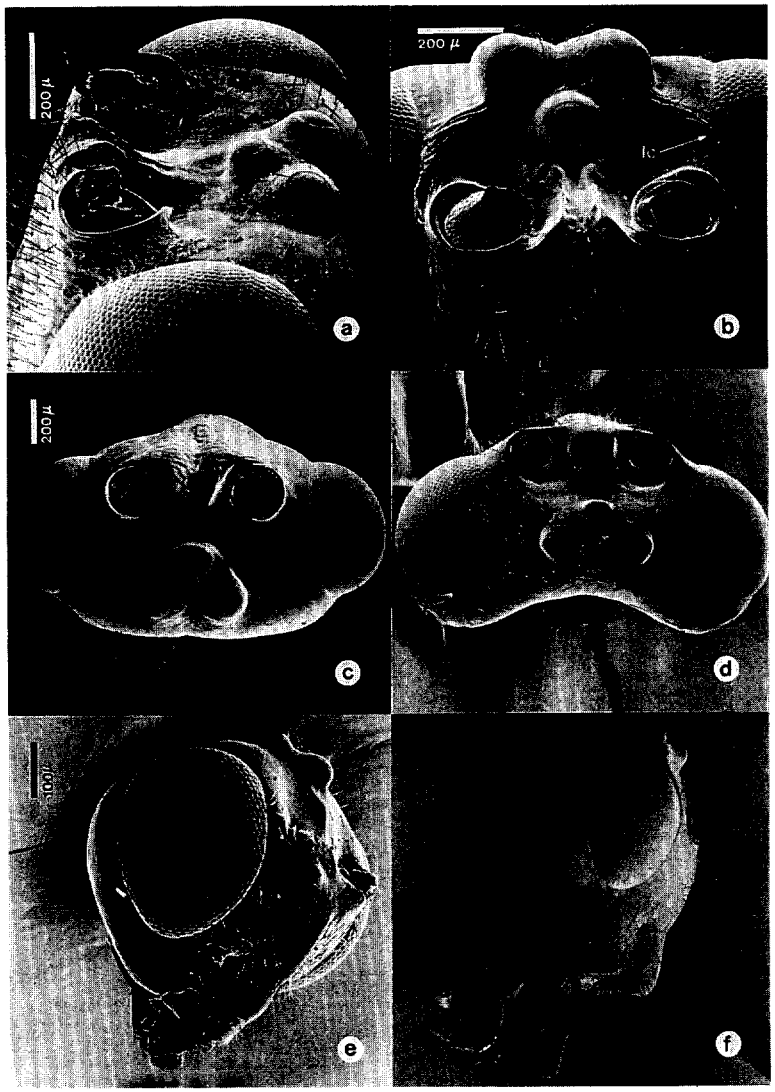


Fig. 3. a. *Coccygidium nihonense*, dorsolateral aspect of frons.
b. *Coccygidium transcaspicum*, anterodorsal aspect of frons, lc=lateral carina.
c. *Euagathis seminovi*, dorsal aspect of frons.
d. *Agathis watanabei*, dorsal aspect of head.
e. *Agathis pumila*, anterolateral aspect of head.
f. *Agathis semiaciculata*, dorsal aspect of head.

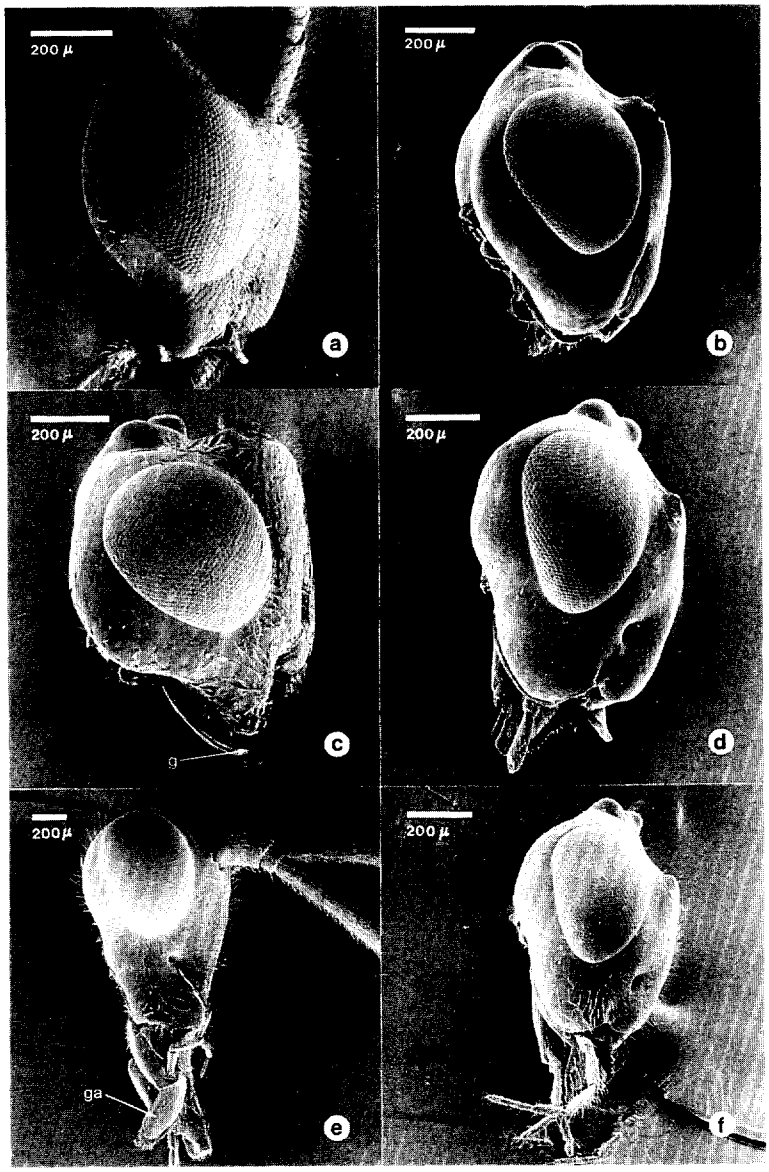


Fig. 4. a. *Bassus festivus*, lateral aspect of head.
b. *Bassus ebulus*, lateral aspect of head.
c. *Bassus semistriatus*, lateral aspect of head, g=gena.
d. *Bassus spatulatus*, lateral aspect of head.
e. *Cremnops desertor*, lateral aspect of head, ga=galea.
f. *Agathis watanabei*, lateral aspect of head.

Fig. 5. a. *Earinus jezoensis*, anterior aspect of head.
b. *Earinus elator*, anterior aspect of head.
c. *Earinus jezoensis*, dorsolateral aspect of head.
d. *Earinus elator*, dorsolateral aspect of head.

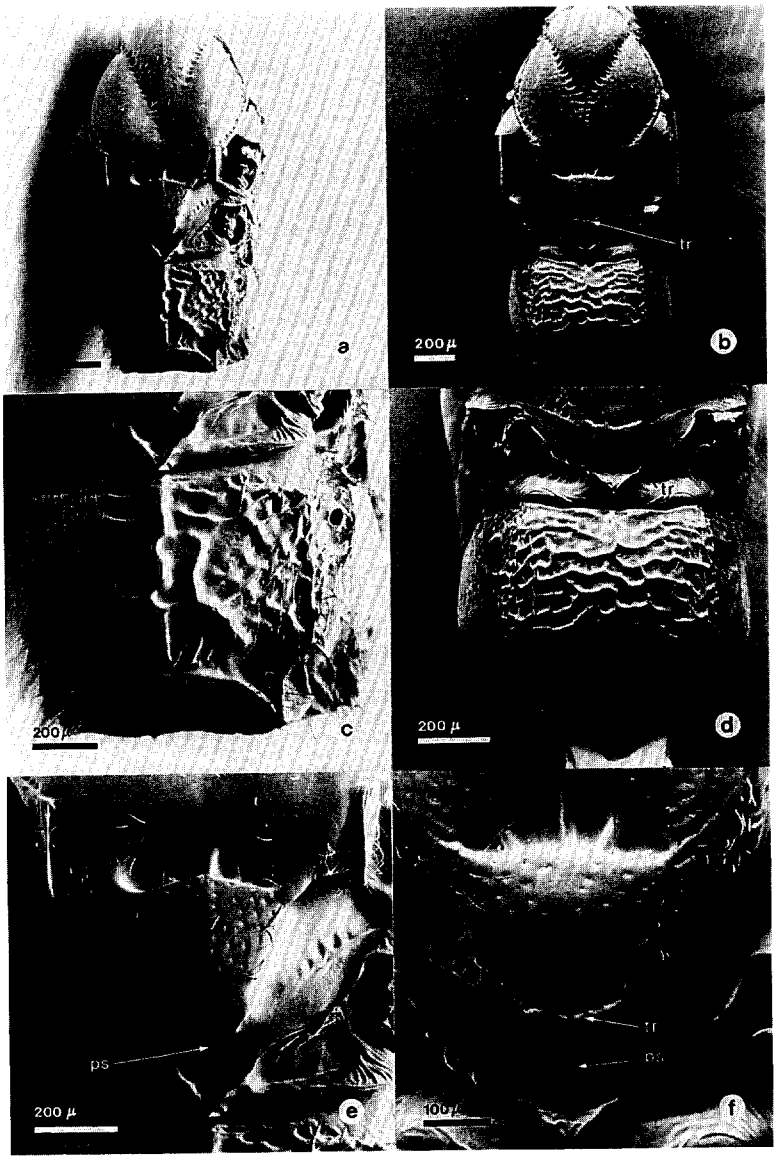


Fig. 6. a. *Bassus ebulus*, dorsal aspect of mesosoma.
b. *Bassus festivus*, dorsal aspect of mesosoma, tr=posterior transverse ridge.
c. *Bassus ebulus*, dorsal aspect of propodeum.
d. *Bassus festivus*, dorsal aspect of propodeum, tr=posterior transverse ridge.
e. *Bassus ebulus*, dorsal aspect of scutellum, ps=posterior surface of scutellum.
f. *Bassus festivus*, dorsal aspect of scutellum, ps=posterior surface of scutellum, tr=posterior transverse ridge.

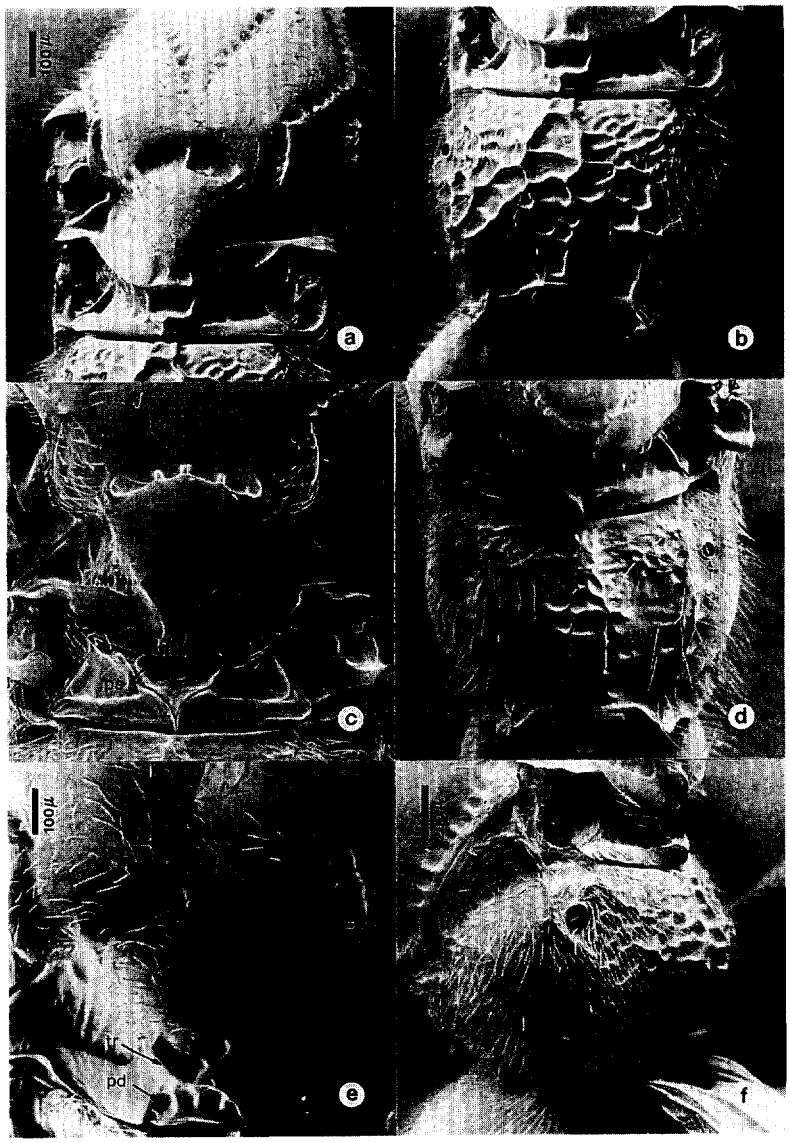


Fig. 7. a. *Bassus conspicuus*, posterodorsal aspect of scutellum.
b. *Bassus conspicuus*, dorsal aspect of propodeum.
c. *Bassus pilosus*, dorsal aspect of scutellum, ps=posterior surface of scutellum.
d. *Bassus pilosus*, dorsal aspect of propodeum.
e. *Bassus semistriatus*, dorsal aspect of scutellum, pd=posterior semicircular depression, tr=posterior transverse ridge.
f. *Bassus semistriatus*, lateral aspect of metapleuron and propodeum.

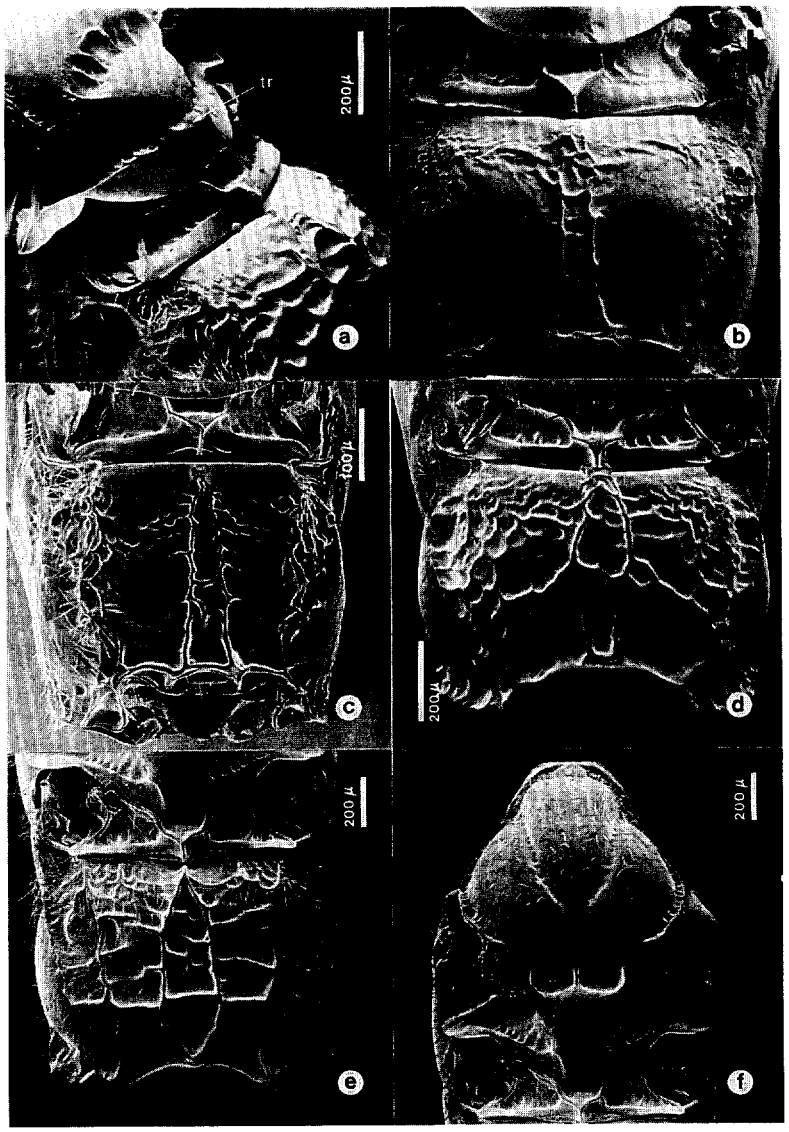


Fig. 8. a. *Bassus cingulipes*, dorsolateral aspect of posterior mesosoma, tr=posterior transverse ridge.
b. *Agathis semiaciculata*, dorsal aspect of propodeum.
c. *Agathis pumila*, dorsal aspect of propodeum.
d. *Agathis watanabei*, dorsal aspect of propodeum, pd=posterior semicircular depression of scutellum.
e. *Cremnops desertor*, dorsal aspect of propodeum.
f. *Cremnops desertor*, dorsal aspect of mesonotum.

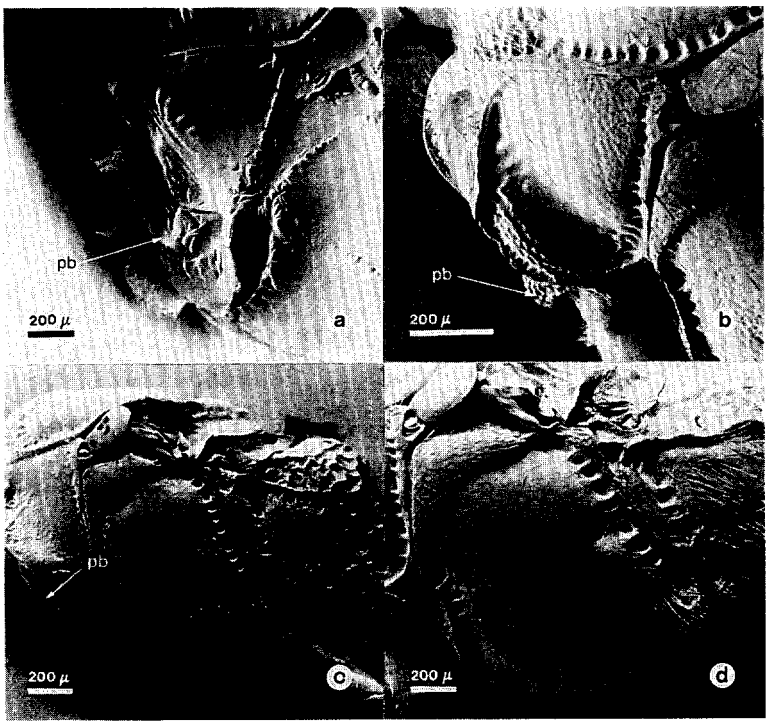


Fig. 9. a. *Bassus ebulus*, anterolateral aspect of mesosoma, pb=propleural bump.
b. *Bassus semistriatus*, lateral aspect of anterior mesosoma, pb=propleural bump.
c. *Bassus cingulipes*, lateral aspect of mesosoma, pb=propleural bump.
d. *Bassus semistriatus*, lateral aspect of mesopleuron.

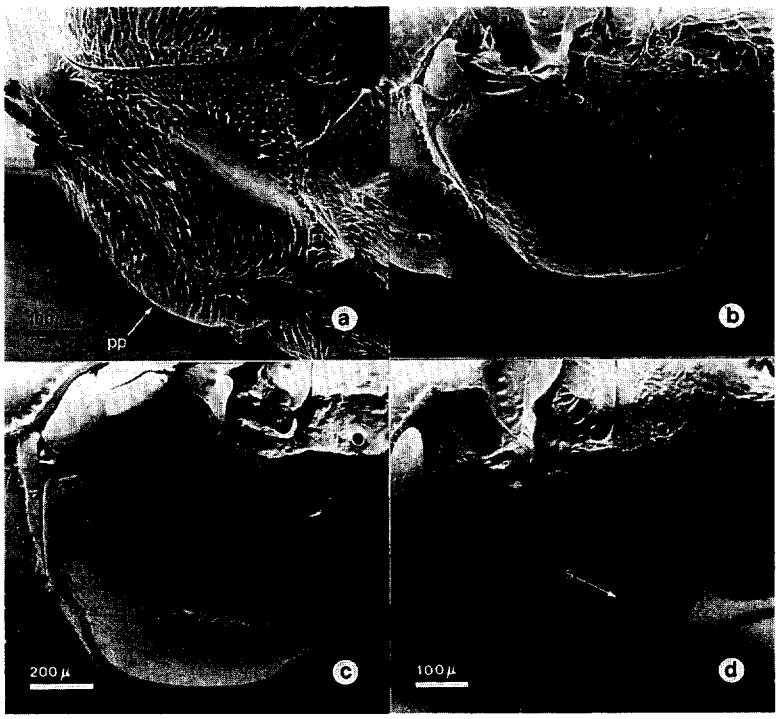


Fig. 10. a. *Agathis semiaciculata*, lateral aspect of anterior mesosoma, pp = propleuron.
b. *Agathis semiaciculata*, lateral aspect of mesopleuron.
c. *Agathis watanabei*, lateral aspect of mesopleuron.
d. *Agathis pumila*, dorsolateral aspect of mesopleuron, s = sternaulus.

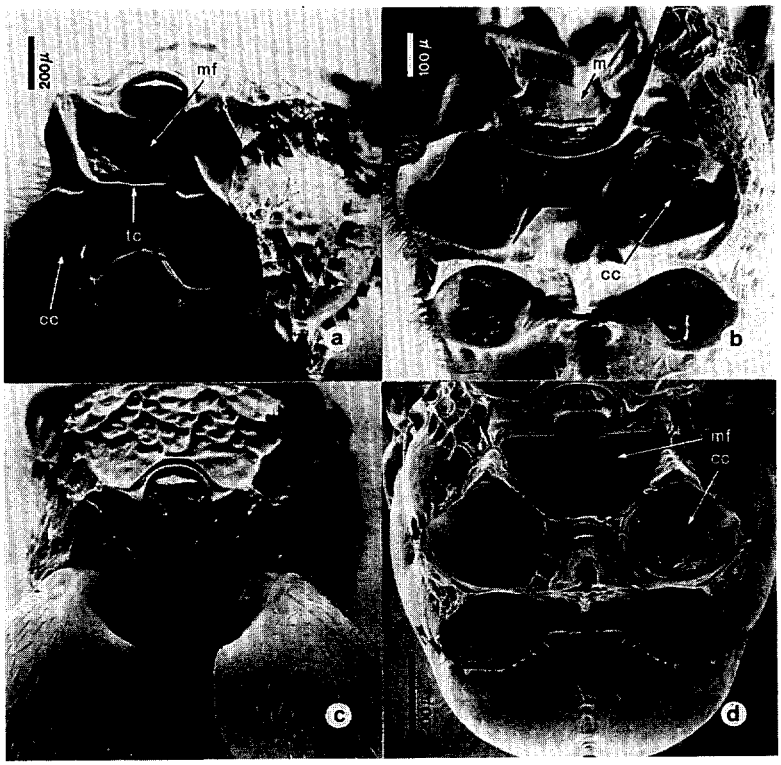


Fig. 11. a. *Bassus ebulus*, posterior aspect of mesosoma with legs and metasoma removed, cc=hind coxal cavity, mf=metasomal foramen, tc=transverse carina.
b. *Bassus festivus*, posterior aspect of mesosoma with legs removed, cc=hind coxal cavity, m=base of metasoma.
c. *Bassus conspicuus*, posterior aspect of mesosoma with metasoma removed.
d. *Agathis watanabei*, posterior aspect of mesosoma with legs and metasoma removed, cc=hind coxal cavity, mf=metasomal foramen.

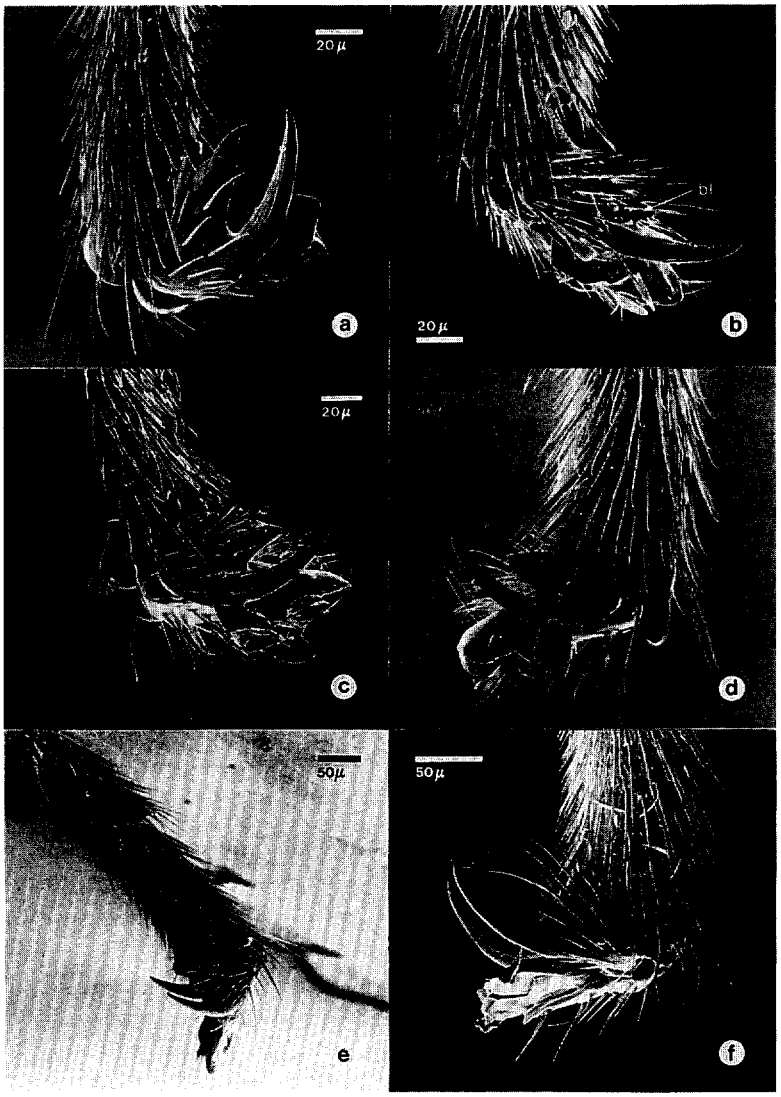


Fig. 12. a. *Agathis watanabei*, hind tarsal claws.
b. *Agathis semiaciculata*, hind tarsal claws, bl=basal lobe.
c. *Bassus pilosus*, hind tarsal claws.
d. *Bassus conspicuus*, hind tarsal claws.
e. *Bassus festivus*, hind tarsal claws.
f. *Bassus ussuriensis*, hind tarsal claws.

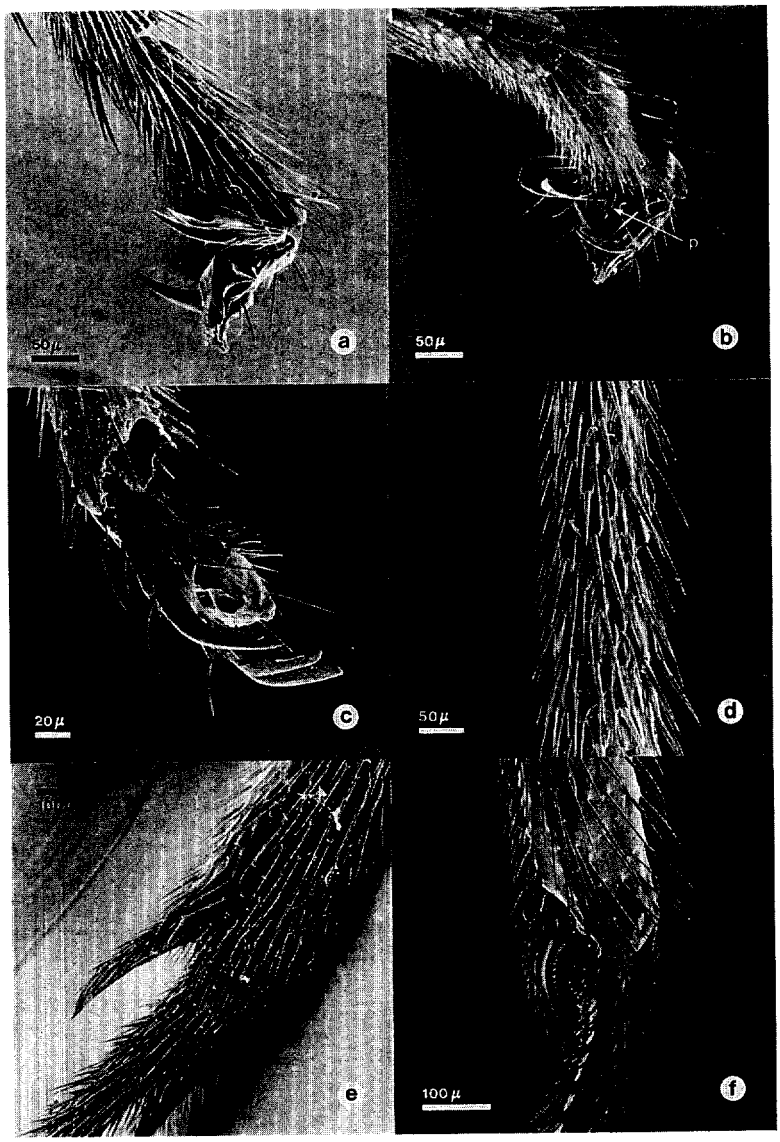


Fig. 13. a. *Cremnops desertor*, hind tarsal claws.
b. *Cremnops desertor*, foretarsal claws, p=pectination.
c. *Coccygidium sp.*, foretarsal claws.
d. *Aneurobracon philippinensis*, mid length of hind tibia.
e. *Cremnops desertor*, apex of hind tibia.
f. *Cremnops desertor*, apex of middle tibia.

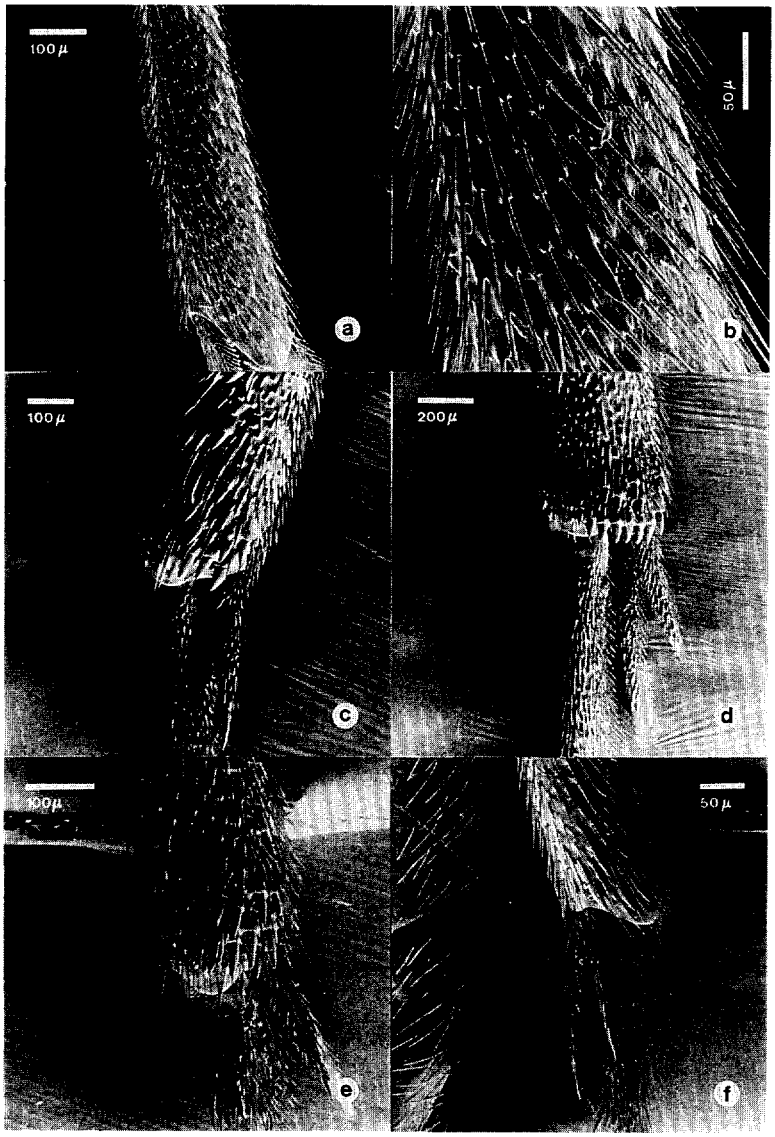


Fig. 14. a. *Bassus ussuriensis*, preapical spines of foretibia.
b. *Bassus ussuriensis*, preapical spines of foretibia.
c. *Bassus ussuriensis*, apex of middle tibia.
d. *Bassus ussuriensis*, apex of hind tibia.
e. *Bassus pilosus*, spines at apex of hind tibia.
f. *Bassus conspicuus*, apex of hind tibia.

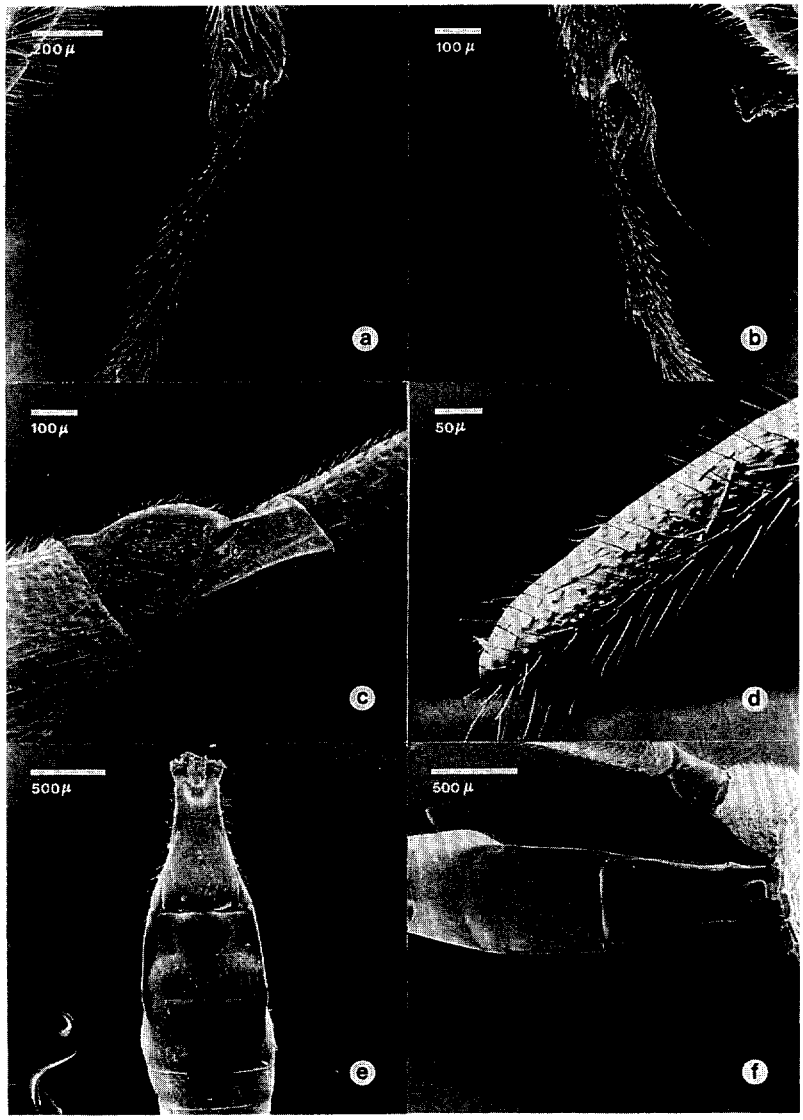


Fig. 15. a. *Coccygidium nihonense*, foretarsal spur.
b. *Coccygidium sp.* foretarsal spur.
c. *Coccygidium sp.* hind trochanter and trochantellus, lc=longitudinal carina.
d. *Bassus ebulus*, apex of ovipositor sheath.
e. *Cremnops desertor*, dorsal aspect of median tergites 1 and 2.
f. *Coccygidium sp.* dorsal aspect of median tergites 1 and 3.

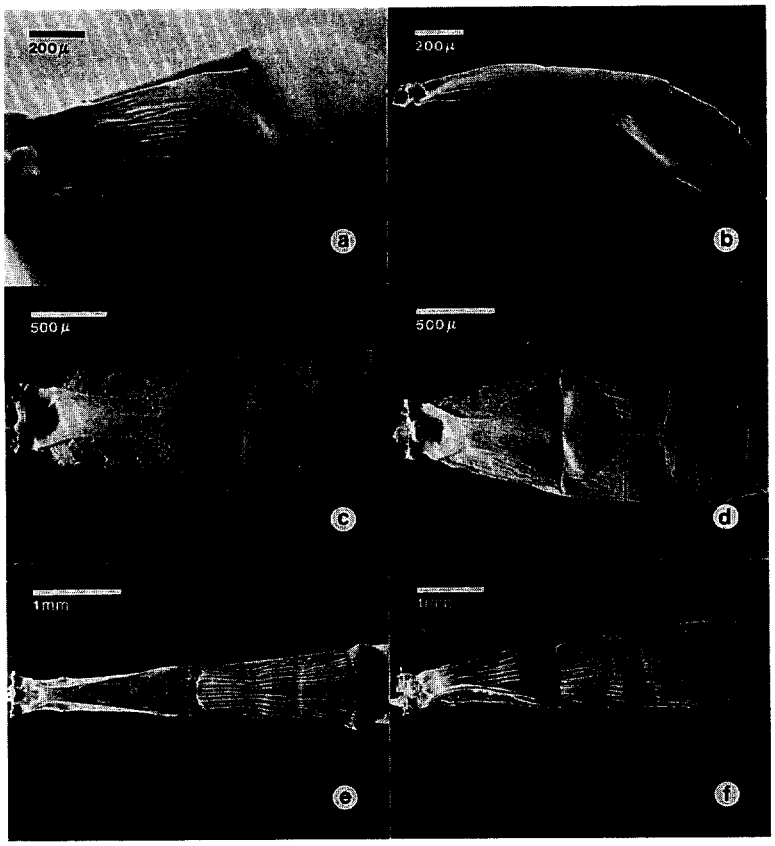


Fig. 16. a. *Agathis watanabei*, dorsal aspect of median tergite 1.
b. *Aneurobracon philippinensis*, lateral aspect of metasoma.
c. *Earinus elator*, dorsal aspect of median tergites 1 and 2.
d. *Earinus jezoensis*, dorsal aspect of median tergites 1 and 2, T 2=median tergite 2.
e. *Braunsia antefurcalis*, dorsal aspect of median tergites 1 and 2.
f. *Braunsia matsumurai*, dorsal aspect of median tergites 1 and 2.

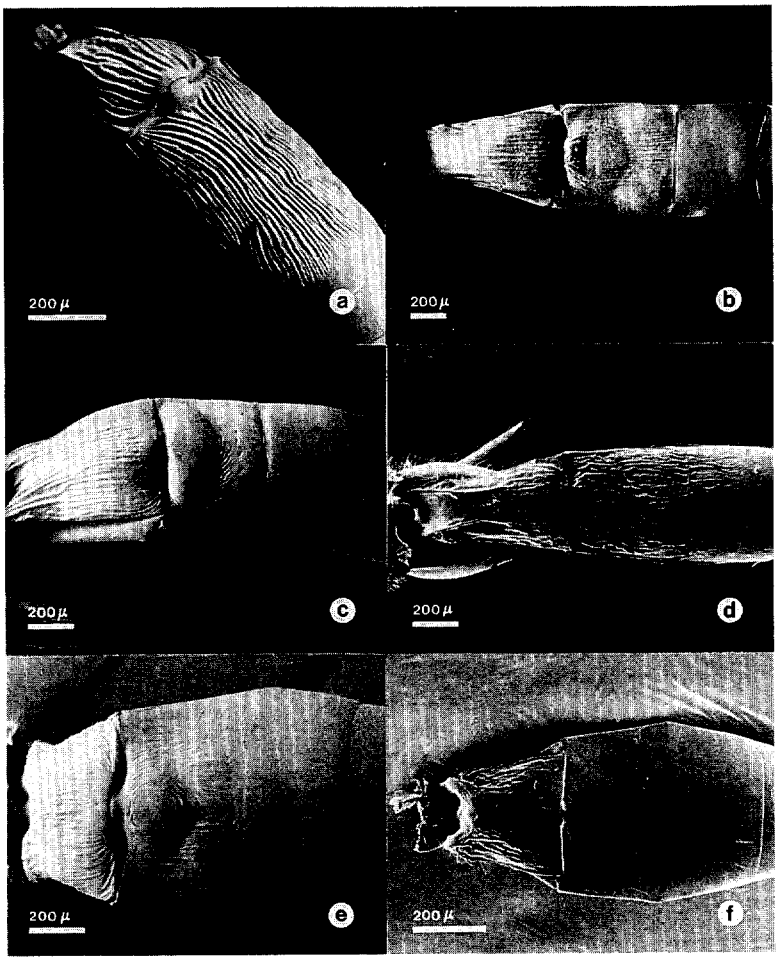


Fig. 17. a. *Bassus ebulus*, dorsolateral aspect of median tergites 1 and 2.
b. *Bassus festivus*, dorsal aspect of median tergites 1 and 2.
c. *Bassus cingulipes*, dorsolateral aspect of median tergites of metasomal segments one and two.
d. *Bassus pilosus*, dorsal aspect of median tergites of metasomal segments one and two, lc=longitudinal carina.
e. *Agathis semiaciculata*, dorsal aspect of median tergites 1 and 2.
f. *Agathis pumila*, dorsal aspect of median tergites 1 and 2.

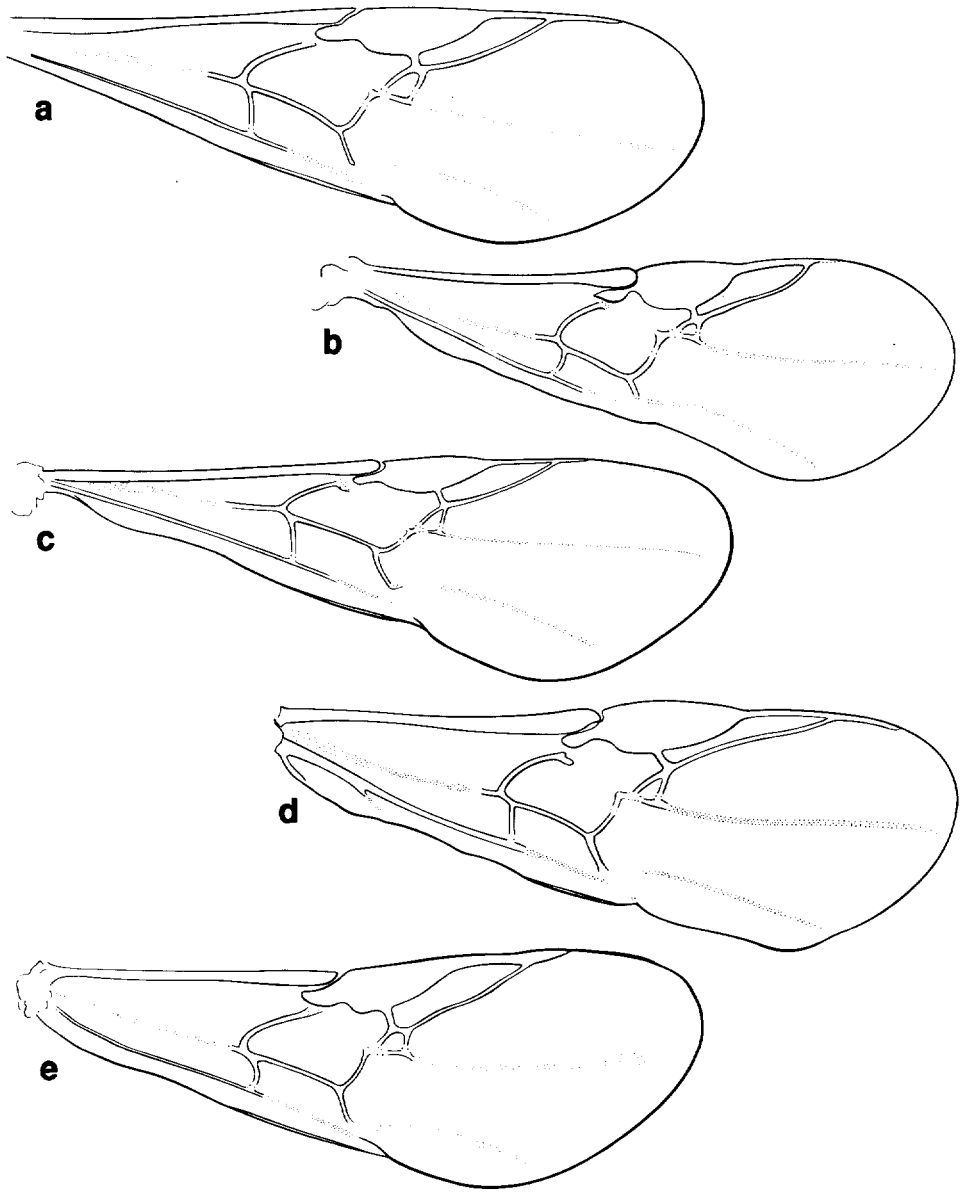


Fig. 18. a. *Agathis asternaulus*, forewing.
b. *Agathis maetoi*, forewing.
c. *Agathis kumatai*, forewing.
d. *Agathis watanabei*, forewing.
e. *Agathis pumila*, forewing.

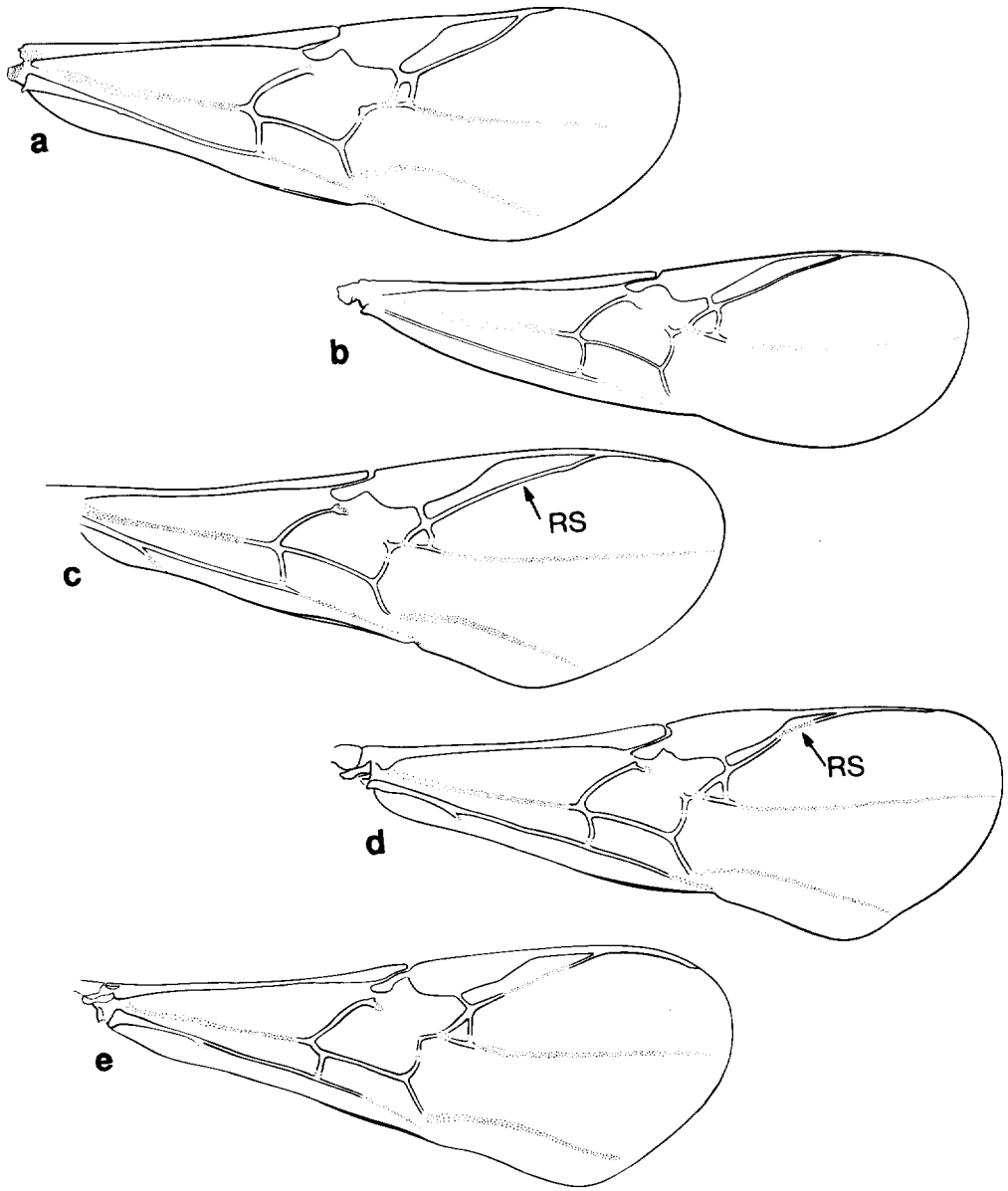


Fig. 19. a. *Agathis semiaciculata*, forewing.
b. *Bassus tumudulus*, forewing.
c. *Bassus albifasciatus*, forewing.
d. *Bassus cingulipes*, forewing.
e. *Bassus conspicuus*, forewing.

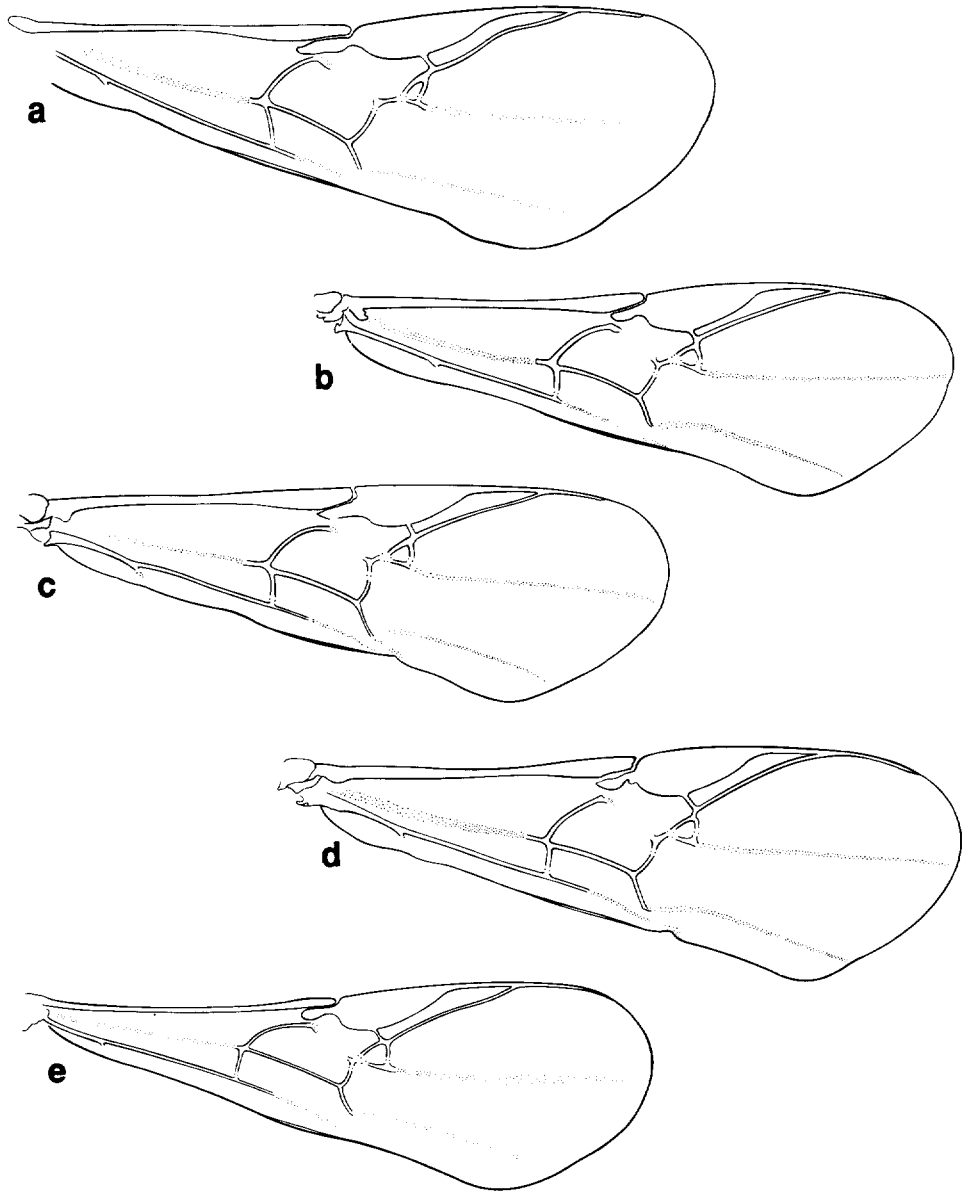


Fig. 20. a. *Bassus coriarius*, forewing.
b. *Bassus ebulus*, forewing.
c. *Bassus festivoides*, forewing.
d. *Bassus festivus*, forewing.
e. *Bassus gracilis*, forewing.

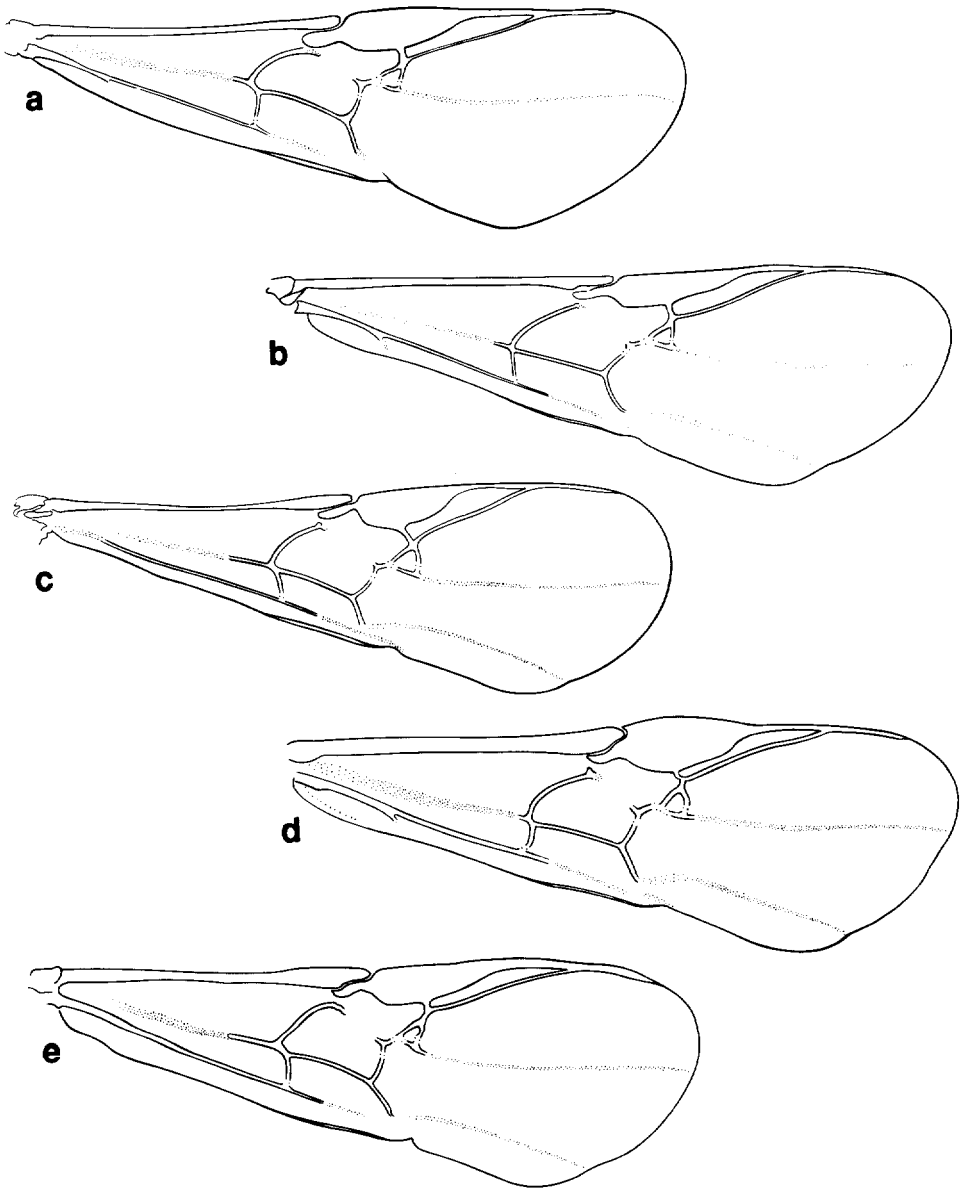


Fig. 21. a. *Bassus inopinatae*, forewing.
b. *Bassus peniculus*, forewing.
c. *Bassus pilosus*, forewing.
d. *Bassus rufipes*, forewing.
e. *Bassus semistriatus*, forewing.

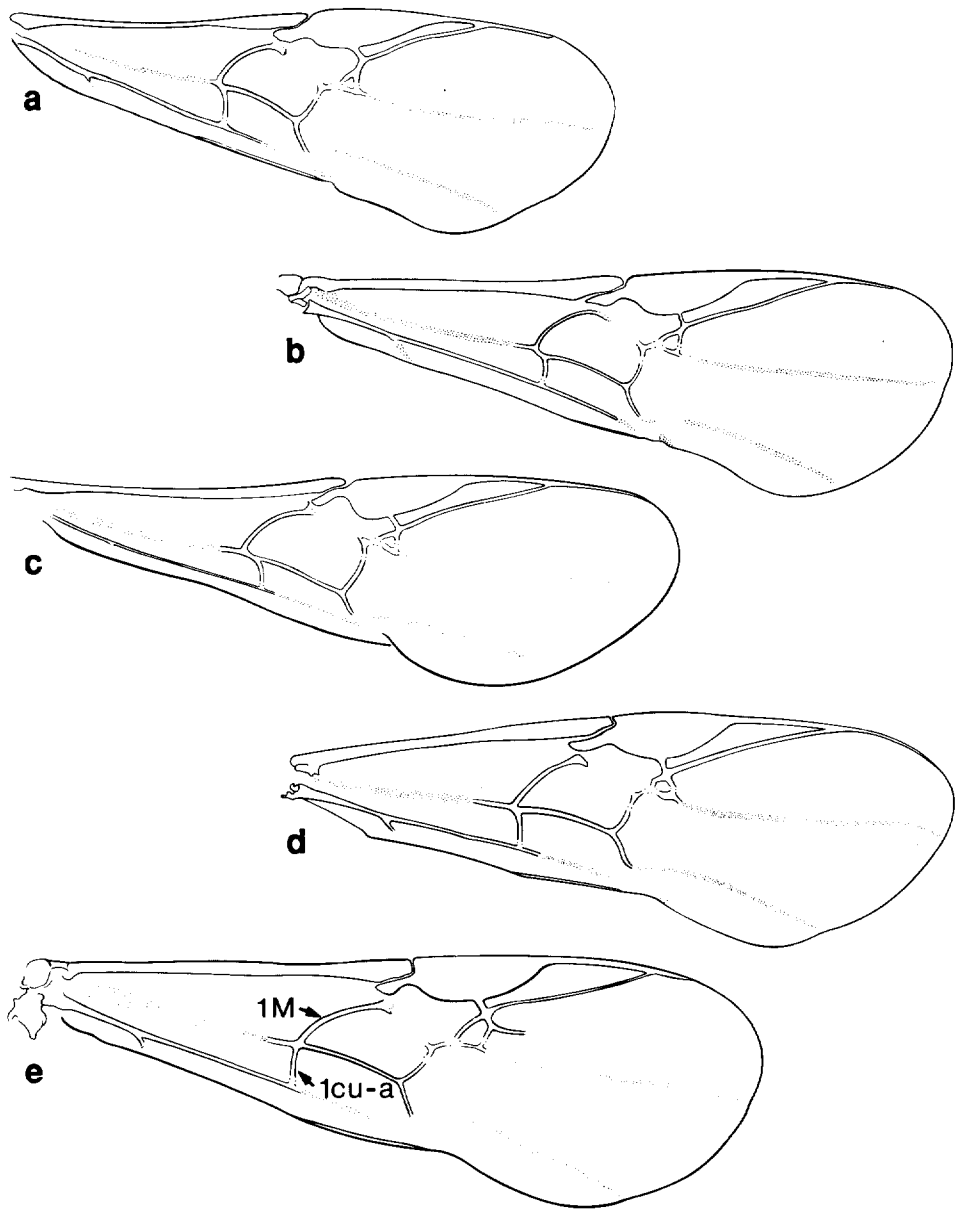


Fig. 22. a. *Bassus spatulatus*, forewing.
b. *Bassus spinosus*, forewing.
c. *Bassus striogranulatus*, forewing.
d. *Bassus ussuriensis*, forewing.
e. *Braunsia antefurcalis*, forewing.

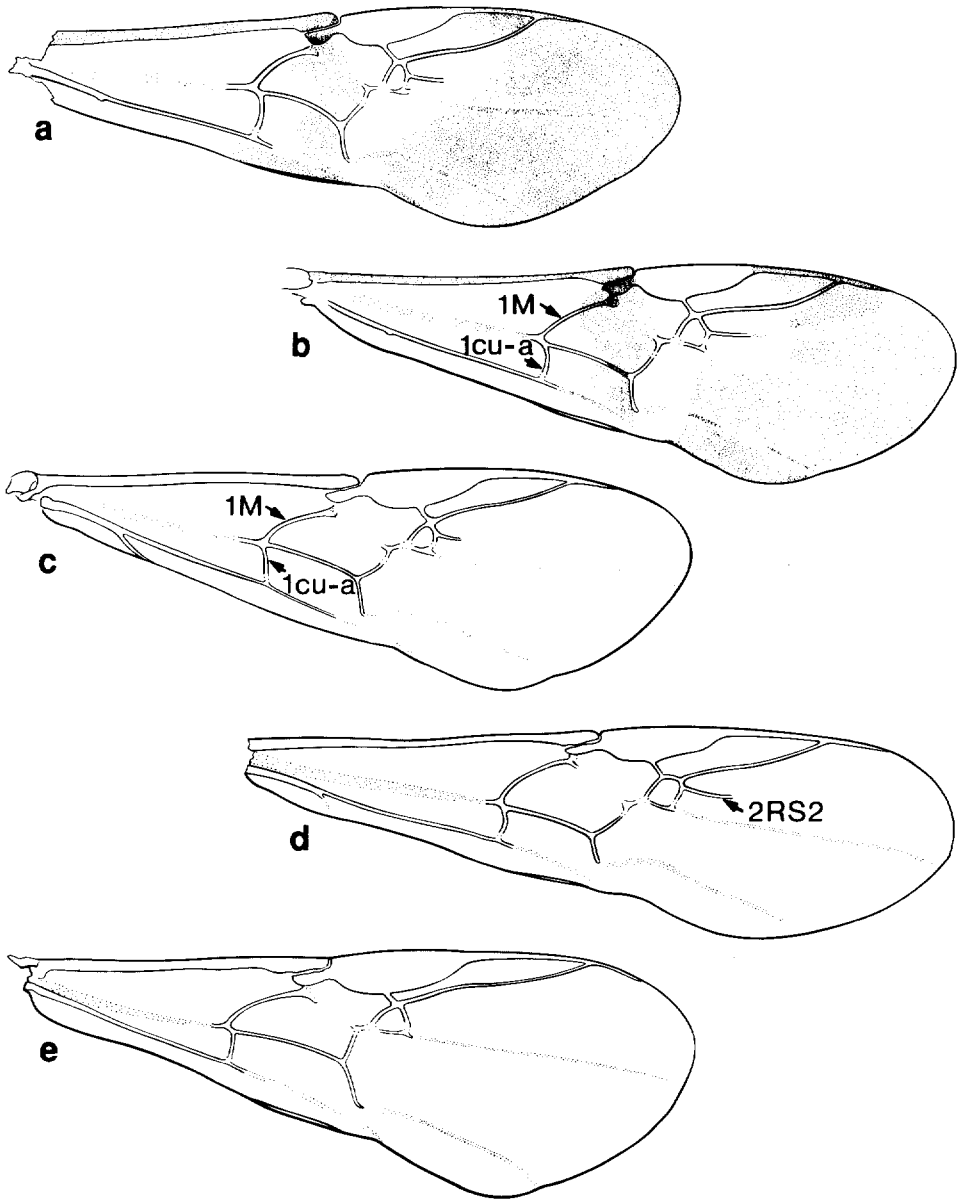


Fig. 23. a. *Laccagathis japonica*, forewing.
b. *Braunsia matsumurai*, forewing.
c. *Braunsia pilosa*, forewing.
d. *Braunsia postfurcalis*, forewing.
e. *Coccygidium nihonense*, forewing.

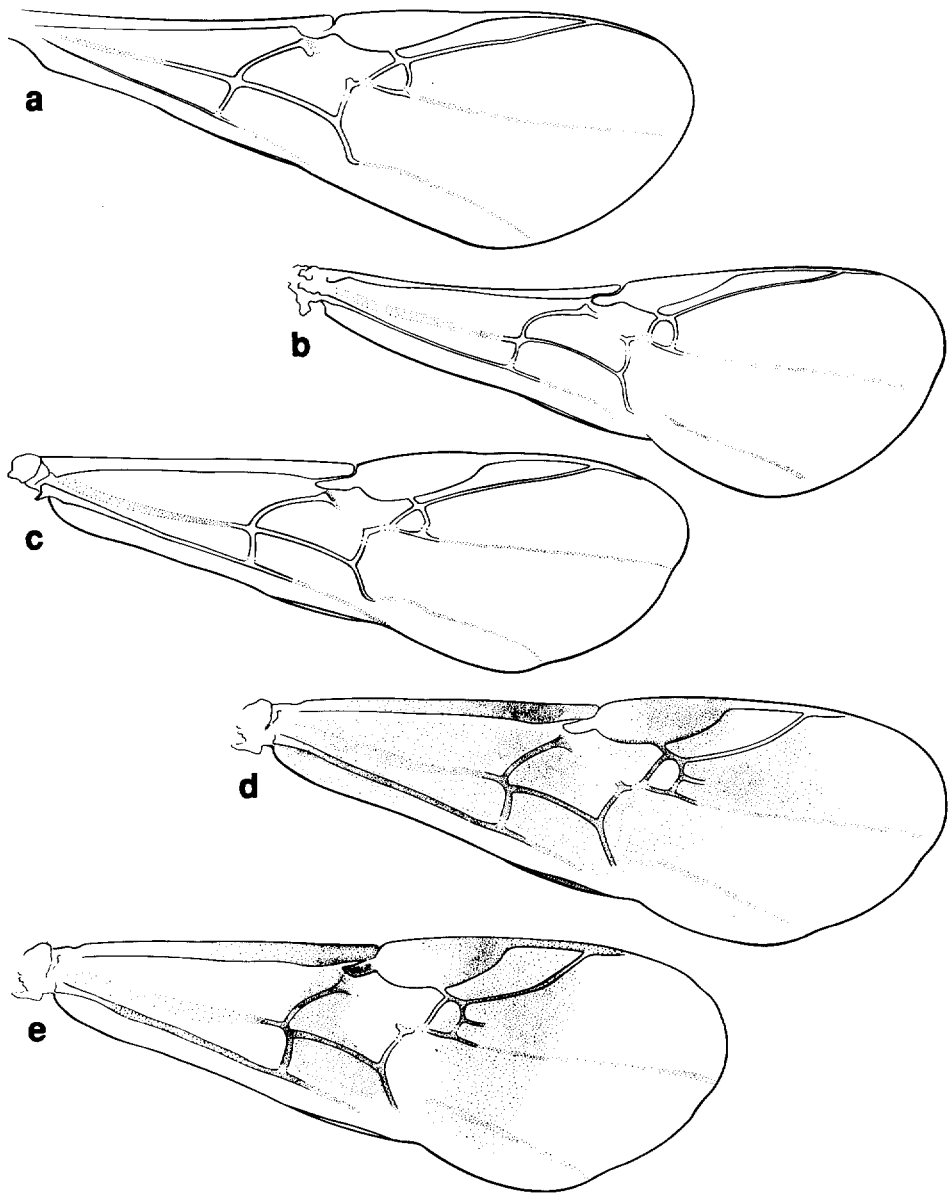


Fig. 24. a. *Coccygidium ruidum*, forewing.
b. *Coccygidium transcaspicum*, forewing.
c. *Coccygidium varipes*, forewing.
d. *Cremnops desertor*, forewing, stippled areas represent infuscation, clear areas represent yellow.
e. *Cremnops desertor*, forewing, stippled areas represent infuscation, clear areas represent yellow.

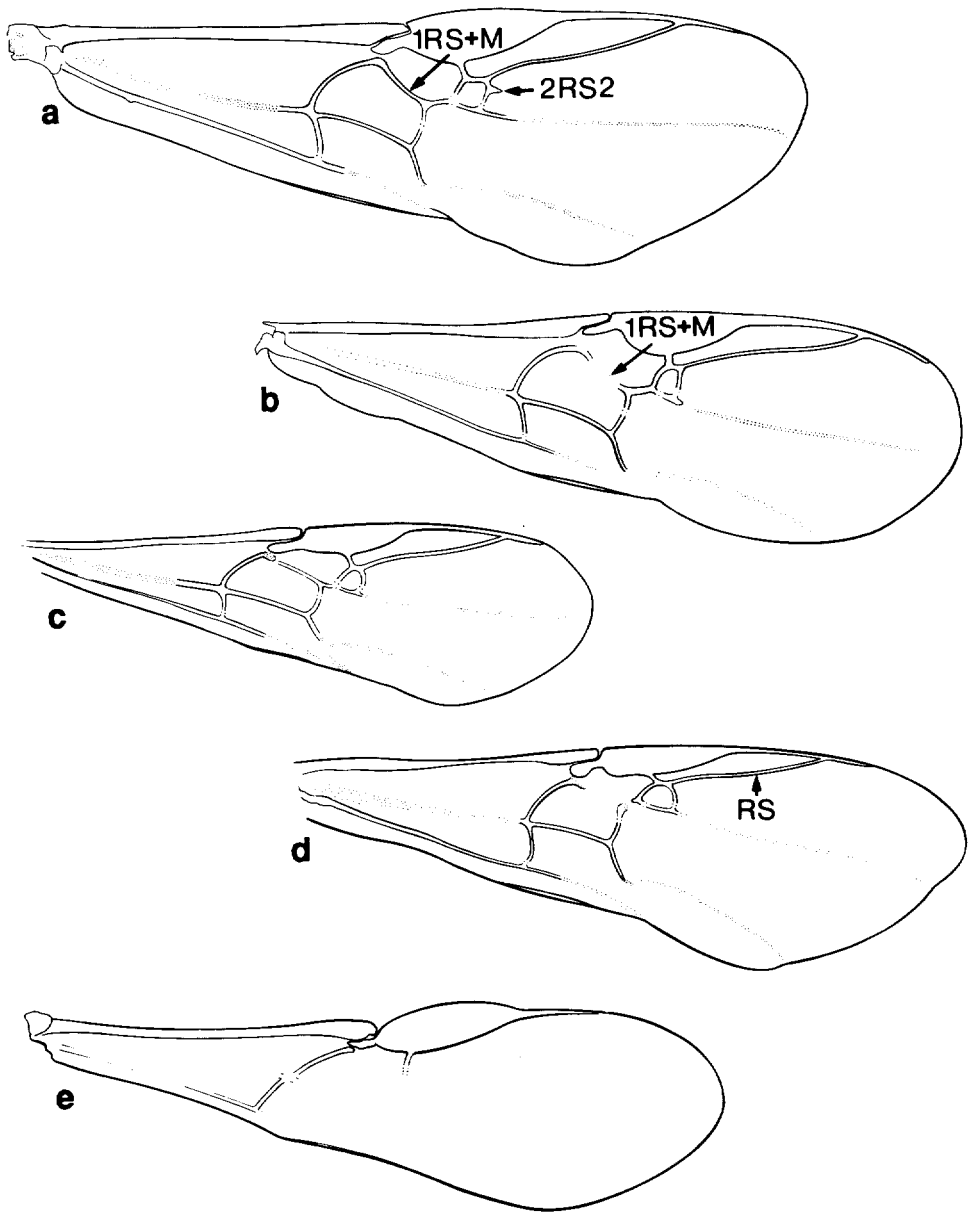
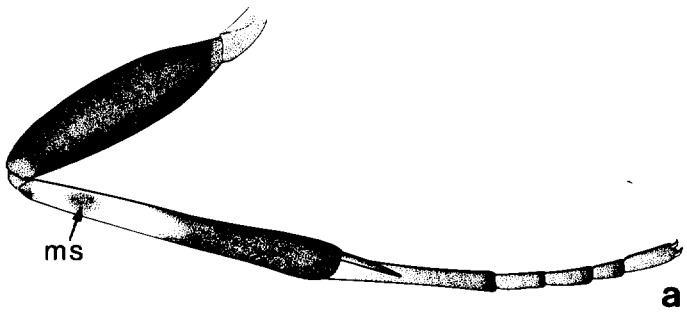


Fig. 25. a. *Earinus elator*, forewing.
b. *Earinus jezoensis*, forewing.
c. *Earinus longensis*, forewing.
d. *Euagathis seminovi*, forewing.
e. *Aneurobracon philippinensis*, forewing.



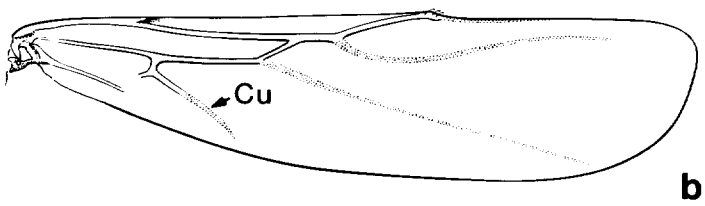


Fig. 26. a. *Bassus festivus*, hind leg.
b. *Bassus conspicuus*, hind wing.