

single ommatidium.

Pronotum microreticulate with shallow large punctures; disc 0.28 mm in width, 1.1 x as long as wide. Mesonotum 0.63 x as long as wide, microreticulate, with 5 large punctures. Mesopleura microreticulate. Propodeum 1.22 x as long as wide, maximum width 3.6 x as minimum width; surface microreticulate.

Gaster very weakly microreticulate and subopaque; 0.50 mm in maximum width as seen from above. Middle tibiae setose.

Holotype. Female, Mt. Sonai-dake, Iriomote-jima I., Okinawa Pref., 21.III.1975, K. Onoyama leg. [NIAES].

Distribution. Ryukyus (Iriomote-jima I.).

#### Subfamily Epyrinae

Epyrini Kieffer, 1914. [As a tribe.]

Type genus: *Epyris* Westwood, 1932.

Epyrinae; Berland, 1928. [Raised to subfamily status.]

Japanese name: Hime-arigatabachi-aka.

This subfamily is the largest and morphologically most diverse group in the Bethyliidae, and contains 40 living genera grouped into 3 tribes in the world (Evans, 1964). The average body size reduces from tribe Epyrini through Sclerodermini to Cephalonomiini. The Epyrini are the least specialized group, and the Cephalonomiini the most specialized.

Thirty-four species in 7 genera are recorded from Japan.

Diagnosis. Medium to small sized wasps with the following combination of characteristics.

1. Eyes large, at least 0.3 x head width.
2. Frons without median longitudinal carina extending from clypeus.
3. Pronotum longer than mesonotum, especially distinct in females.
4. Metanotum reduced; scutellum in contact with propodeum medially or nearly so.
5. Dorsolateral corners of propodeum angulate or foveolate, but never forming

distinct spine.

6. Basal vein simple, not giving rise to a stub vein.
7. Claws weakly to moderately curved.

#### Tribe Epyrini

Japanese name: Hime-arigatabachi-zoku.

This tribe is separable from the others by the following combination of characteristics: 1) antennae with 13 segments; 2) clypeus with a well projecting median lobe; 3) eyes situated laterally on head; 4) dorsolateral corners of propodeum usually foveolate; 5) PF = 6-5, 3-2.

#### Genus Epyris Westwood

- Epyris Westwood, 1932. London Edinburgh Phil. Mag., Jour. Soc., (3)1: 129.
- Muellerella saussure, 1892. In Grandidier, Hist. Madagascar, 20: pl 5, fig. 20. [Synonymized by Evans, 1964.]
- Parpepyris Kieffer, 1913. Boll. Lab. Zool. Portici, 7: 108. [Synonymized by Evans, 1964.]
- Psilepyris Kieffer, 1913. Boll. Lab. Zool. Portici, 7: 108. [Synonymized by Evans, 1964.]
- Artiepyris Kieffer, 1913. Boll. Lab. Zool. Portici, 7: 108. [Synonymized by

Evans, 1969.]

Artiepyris: Evans, 1964. [As subgenus of Epyris.]

Dulos Motschulsky, 1863. Bull. Soc. Imp. Nat. Moscou, 36: 267. [Synonymized by Krombein, 1987.]

Calyozella Enderlein, 1920. Zool. Anz., 51:24. [Synonymized by Krombein, 1992.]

Calyzoa Westwood in Hope, 1837. Trans. Ent. Soc. London, 2: 56. [Synonymized by Krombein, 1992.]

Pseudocalyzoa Turner, 1915. Ann. Mag. Nat. Hist., (8)16: 298. [Synonymized by Krombein, 1992.]

Paracalyzoa Cameron, 1909. Deutsche Ent. Zeit., 1909: 377. [Synonymized by Krombein, 1992.]

Homoglenus Kieffer, 1904. Ann. Mus. Civ. Stor. Nat. Genova, Ser. 3, 1: 388. [Synonymized by Terayama, 1994; part I of the present paper.]

Japanese name: Hime-arigatabachi-zoku.

Diagnosis. Medium to small species with the following combination of characteristics.

1. PF = 6, 3.
2. Lateral lobes of clypeus small or reduced.
3. Antennae simple or pectinate, with 13 segments; in some species 2nd and/or 3rd segments ring-like.
4. Pronotum in usual longer than wide.



5. Notauli and parapsidal furrows complete.
6. Scutellum with a pair of pits basally.
7. Propodeum with, at least, median, lateral and transverse carinae.
8. Pterostigma developed.
9. Basal vein arising almost at posterior end of subcosta.
10. Radial vein long, at least longer than median vein.

In Japan, two species, *E. apicalis* and *E. crassicornis*, have been described up to the present. The type of the latter species described by Walker, 1874, was lost (Morley, 1913). Unfortunately the description of the species is so simple and superficial that I cannot specify the true *crassicornis* in Japanese species.

The male-female relationships were poorly known in this genus, since it is usually difficult to associate the two sexes using dead specimens.

Key to the Japanese species of *Epyris*

(Female)

1. Wings short; fore wings only slightly extending beyond the posterior border of propodeal disc..... *E. emiae* sp. nov. [Hon]
- Wings fully developed.....2
2. Scutellar pits separated by a thin septum .....3
- Scutellar pits separated at least by 1.5 x their own maximum

- diameters.....4
3. Head and pronotal disc moderately punctate; propodeum with 5 discal carinae .....*E. hagogomonis* sp. nov. [Hon, Shi, Kyu, Yaku]
- Head and pronotal disc microreticulate but without punctures; propodeum with 3 discal carinae .....*E. hiten* sp. nov. [Hon, Kyu]
4. Eyes without erect hairs; large species; HL more than 1.25 mm, HW more than 1.20 mm; mandibles each with a lobe at outer margin .....*E. formosus* nom. nov. [Hon, Kyu]
- Eyes with short erect hairs; smaller species; HL less than 1.10 mm, HW less than 1.15 mm; mandibles without lobe at outer margin.....5
5. Lateral margins of basal area of propodeum depressed; posterior border of head straight; its posterolateral corners forming distinct angle .....*E. asura* sp. nov. [Hok, Hon, Kyu]
- Lateral margins of basal area of propodeum not depressed; posterior border of head convex; its posterolateral borders rather rounded .....6
6. Head and pronotal disc with abundant small punctures and decumbent hairs as in Fig. 276 .....*E. otome* sp. nov. [Hok, Hon, Kyu]
- Head and pronotal disc moderately punctate as in Fig. 275 .....7
7. Sublateral areas of propodeum with numerous oblique rugae; front angle of ocellar triangle approximately right-angled .....*E. tennyō* sp. nov. [Hok, Hon, Kyu]
- Sublateral areas of propodeum microreticulate, without distinct rugae;



front angle of ocellar triangle acute.....  
.....E. surusumi sp. nov. [Hon, Kyu]

(Male)

1. 4th to 11th antennal segments each pectinate.....2
- Antennae simple, not pectinate.....3
2. 3rd antennal segment small, forming a ring joint; 12th segment pectinate  
; larger specie, TL 6-7 mm in body length .....  
.....E. formosus nom. nov. [Hon, Kyu]
- 3rd antennal segment almost as long as 4th and pectinate; 12th  
segment not pectinate; smaller species, TL 2.5-3 mm in body length  
..... E. pectinatus sp. nov. [Hon, Kyu]
3. Metacarpus vein long, as long as pterostigma or more .....4
- Metacarpus vein short, shorter than the length of pterostigma .....6
4. Scutellar pits separated by more than 1.0 x their own maximum diameter  
.....E. idaten sp. nov. [Hon, Kyu]
- Scutellar pits separated by less than 0.5 x their own maximum diameter  
.....5
5. Propodeum with sublateral carinae; sublateral areas with transverse  
rugae; head length more than 0.70 mm.....E. shohki sp. nov. [Kyu]
- Sublateral carinae absent; sublateral areas without transverse rugae;  
head length 0.41 mm.....E. yakushimanus sp. nov. [Yaku]
6. Scutellar pits separated by less than 0.5 x their own maximum diameters;

lateral carinae present on propodeum.....  
.....E. yamatonis sp. nov. [Hon, Shi, Kyu, Yaku, Ryu]

- Scutellar pits separated by more than 1.0 x their own maximum diameter  
.....7
7. Legs excluding tarsi uniformly black or blackish brown.....8
- At least tibiae medium to yellowish brown.....9
8. Propodeum with 5 distinct discal carinae.....  
..... E. nubatama sp. nov. [Hok, Hon]
- Propodeum with a median carina, without distinct submedian carinae  
.....E. hachijoanus sp. nov. [Hon; Izu Is.]
9. Propodeum without submedian carinae; minute species; HL 0.60 mm.....  
.....E. minoensis sp. nov. [Hon]
- Propodeum with distinct submedian carinae; larger species; HL more  
than 0.85 mm.....10
10. Median carina of propodeum not reaching the transverse carina; sublateral  
areas smooth and shining.....E. blandus sp. nov. [Hon, Kyu]
- Median carina of propodeum reaching the transverse carina; sublateral  
areas microreticulate.....E. niwoh sp. nov. [Hok, Hon, Kyu]



*Epyris asura* sp. nov.

(Figs. 245, 271-272)

Japanese name. Ashura-hime-arigatabachi.

Holotype. Female. HL 1.20 mm; HW 1.18 mm; WF 0.75 mm; LA 2.40 mm; LPD 0.63 mm; WPD 0.85 mm; TL 6.0 mm.

Body black; anterior half of mandibles reddish brown; antennal funiculus blackish brown; tarsi reddish brown.

Head nearly as long as wide, with straight posterior border in frontal view; posterolateral borders forming a distinct angle; surface microreticulate with punctures moderately. Mandibles with two teeth; apical long and basal small. Clypeus with a narrow U-shaped emargination. First 5 segments of antennae in a ratio of about 16:3:3.5:6:6 in length; scape 2.3 x as long as wide; 2nd and 3rd segments each wider than long; 4th segment 1.3 x as long as wide. Eyes with short hairs, 0.48 mm in length; WF 1.56 x EL. Ocelli small, forming a regular triangle; OOL 1.8 x WOT.

Pronotal disc 1.38 x as long as wide, microreticulate with punctures moderately. Mesonotum microreticulate; mesoscutum rather flat and short dorsally; scutellar pits oblique, elliptical, separated by 5.0 x their own maximum diameters. Propodeal disc 0.74 x as long as wide, broadest at posterior end; posterior border weakly convex; median carina strong, reaching the transverse carina; submedian carinae weak and relatively irregular, not reaching the transverse carina; lateral borders of basal triangle depressed; sub-

lateral areas striate.

Middle tibiae spinose.

Metacarpus vein of forewings minute.

Variation. Available specimens vary in head length from 0.78 to 1.10 mm; head width from 0.70 to 1.15 mm.

Holotype. Female, Adachi-machi, Adachi-gun, Fukushima Pref., 25.VIII.1977, Miyano leg. [NIAES].

Paratypes. 1f, Ashoro-mura, Tokachi, Hokkaido, 30.VII.1949, R. Matsuda leg. [KUF]; 1f, Zenibako, Hokkaido, 4.II.1910, Matsumura leg. [HUS]; 1f, Momijiyama, Ishikari, Hokkaido, 5.VIII.1968, T. Nambu leg. [TE]; 1f, Rifu-cho, Miyagi Pref., 8.XI.1984, K. Goukon leg. [TE]; 1f, Utsunomiya-shi, Tochigi Pref., 13.X.1977, T. K. leg. [TE]; 1f, Akahama, Yorii-machi, Saitama Pref., 14.VI.1984, T. Nambu leg. [MCSN]; 1f, Iwatsuki-shi, Saitama Pref., 31.VIII.1964, Y. Yoshikawa leg. [TE]; 1f, Yokohama, Kanagawa Pref., 25.V.1933, K. Sato leg. [NASM]; 1f, same locality, 21.V.1933, K. Sato leg., [NASM]; 1f, Hiyoshi, Yokohama-shi, Kanagawa Pref. [NASM]; 1f, Miho, Shizuoka Pref., 25.XI.1933, K. Sato leg. [NASM]; 1f, Hakozaeki, Fukuoka Pref., 13.V.1959, Y. Murakami leg. [KUF]; 1f, Fukuoka Pref., 29.III.1929, T. Matsuo leg., [KUF]; 1f, Takachihono-mine, Kagoshima Pref., 31.VII.1972, K. Kusigemati leg. [KU-K].

Distribution. Hokkaido, Honshu, Kyushu.



*Epyris emiae* sp. nov.

(Figs. 246-247)

Japanese name: Kobano-arigatabachi.

Holotype. Female. HL 0.78 mm; HW 0.66 mm; WF 0.43 mm; AL 1.35 mm; LPD 0.41 mm; WPD 0.43 mm; TL 3.8 mm.

Body black; mandibles reddish brown; antennae reddish brown except for basal 2/3 of scape blackish brown; apical 5 segments somewhat brownish; coxae and femora blackish brown; trochanters reddish brown; basal half of tibiae blackish brown; apical half of tibiae and tarsi reddish brown.

Head oval, 1.18 x as long as wide, microreticulate with shallow punctures sparsely. Mandibles with two teeth; basal tooth small. Median lobe of clypeus forming obtuse triangle; anterior border rounded. First 5 segments of antennae in a ratio of about 11:3:3:3.2:4 in length. Eyes with relatively long standing hairs which are ca. 0.35 mm in length and 0.30 mm in diameter; WF 1.23 x EL. Ocelli small, forming a regular triangle; OOL 2.0 x WOT.

Pronotal disc as long as wide, microreticulate with very shallow punctures sparsely. Scutellar pits oblique, elliptical, separated by 2.0 x their own maximum diameter. Propodeal disc almost as long as wide, posterior border straight; median carina reaching the transverse carina; basal triangular area with irregular longitudinal rugae; sublateral areas with relatively weak transverse rugulae.

Gaster smooth and shining. Middle tibiae with several spines.

Wings short, forewing extending beyond the posterior border of propodeal disc by about 1/6 of their length; pterostigma present at 0.75 x distance from wing base to top; radial vein obtuse.

Holotype. Female, Hijita, Koriyama-shi, Fukushima Pref., VII.1971, Miyano leg. [NIAES].

Paratypes. 2ff, Iwatsuki-shi, Saitama Pref., 28.VII.1965, Y. Yoshikawa leg. [NIAES, MCSN]; 1f, Kinuta-koen, Ohkura, Setagaya-ku, Tokyo, 5.X.1969, Y. Yoshikawa leg. [NASM]; 1f, Ikuta, Kawasaki-shi, Kanagawa Pref., 7.VI.1972, Y. Yoshikawa leg. [TE]; 1f, Chigasaki, Kanagawa Pref., 23.X.1934, K. Sato leg. [NASM]; 1f, Kamakura, Kanagawa Pref., 20.V.1956, H. Nagase leg. [TE]; 1f, same locality, 4.IX.1950, H. Nagase leg. [TE].

Distribution. Honshu.

*Epyris hagoromonis* sp. nov.

(Figs. 280-282)

Japanese name: Hagoromo-arigatabachi.

Holotype. Female. HL 0.83 mm; HW 0.78 mm; FW 0.50 mm; LA 1.58 mm; LPD 0.40 mm; WPD 0.65 mm; FWL 2.5 mm; TL 4.4 mm.

Head and alitrunk black; gaster almost black but weakly brownish; mandibles brown; antennae brown except for basal 2/3 of scape blackish brown; coxae, trochanters, femora, and anterior half of tibiae blackish brown; pos-



terior half of tibiae and tarsi yellow.

Head 1.06 x as long as wide, with convex posterior border in frontal view; surface microreticulate and moderately punctate. Mandibles with two teeth. Clypeus narrowly rounded anteriorly. First 5 segments of antennae in a ratio of about 12:4:3:3.8:4 in length; 2nd segment slightly longer than wide; 3rd segment almost as long as wide; 4th segment slightly longer than wide. Eyes with relatively long stinging hairs. 0.34 mm in length; FW 1.47 x EL. POL:AOL = 5:3.5; OOL 1.5 x WOT.

Pronotal disc 0.62 x as long as wide, microreticulate and moderately punctate. Mesonotum microreticulate with scattered shallow punctures; scutellar pits rather transverse, ca. 4 x as long as wide, situated close to each other. Propodeal disc 0.61 x as long as wide, widest at posterior end; posterior border weakly concave; 5 discal carinae present; median carina and 2nd submedian carinae reaching the transverse carina; 1st submedian carinae reaching near the transverse carina; strong sublateral carinae present; sublateral areas with oblique rugae; lateral areas with transverse rugae.

Gaster smooth and shining. Middle tibiae spinose.

Metacarpus vein of forewings minute; pterostigma wide, 2.0 x as long as wide; transverse median vein not strongly turned to the base posteriorly.

Variation. specimens examined vary in head length from 0.78 to 0.83 mm, and in head width from 0.68 to 0.78 mm.

Holotype. Female, Iwatsuki-shi, Saitama Pref., 23.V.1965, Y. Yoshikawa leg. [NIAES].

Paratypes. 1f. Tenjinzawa, Miyagi Pref., 17.VI.1985, K. Goukon leg. [TE]; 1f. Numata-shi, Gunma Pref., 30.VII.1977, T. Takei leg. [MCSN]; 1f. 1m. Iwatsuki-shi, Saitama Pref., 29.VII.1964, Y. Yoshikawa leg. [TE]; 1f, same locality, 25.V.1965, Y. Yoshikawa leg. [TE]; 1f, same locality, 20.VIII.1968, Y. Yoshikawa leg. [SMNH]; 1f, same locality, 29.VIII.1971, Y. Yoshikawa leg. [TE]; 1f, Setagaya-ku, 8.IV.1928, K. Sato leg. [NASM]; 1f, Kitayama, Fujinomiya-shi, Shizuoka Pref., 27-28.IX.1980, [TE]; 1f, Sugitate nr Matsuyama, Ehime Pref., 9.VI.1958, M. Miyatake leg. [EUM]; 1f, Fukuoka, 16.III.1929, T. Matsuno leg. [KUF]; 1f, Mt. Kaimon-dake, Kagoshima Pref., 19.VII.1970, Y. Yoshikawa leg. [TE].

Distribution. Honshu, Shikoku, Kyushu.

Remarks. This is a common species distributed from Honshu to Kyushu.

*Epyris hiten* sp. nov.

(Figs. 268-270)

Japanese name: Hiten-arigatabachi.

Holotype. Female. HL 0.68 mm; HW 0.55 mm; WF 0.38 mm; LA 1.20 mm; LPD 0.36 mm; WPD 0.43 mm; FWL 1.9 mm; TL 3.0 mm.

Head and alitrunk black; gaster dark castaneous; mandibles and antennae brown to reddish brown; legs brown.

Head oval, with round occipital border and round posterolateral borders in



frontal view, 1.24 x as long as wide, and densely microreticulate and obscurely punctate. Mandibles with two teeth. Clypeus broadly rounded medially. First 5 segments of antennae in a ratio of about 11:3:3:2.5:2.5 in length; scape long, 3.6 x as long as wide, with almost parallel sides; 2nd and 3rd segments each slightly longer than wide; 4th and 5th each slightly wider than long. Eyes with standing hairs, 0.25 mm in length; WF 1.52 x EL. Ocelli forming a regular triangle; OOL 1.7 x WOT.

Pronotal disc 0.62 x as long as wide, densely microreticulate with obscure, shallow and small punctures sparsely. Mesonotum densely microreticulate; scutellar pits subrectangular, 1.5 x as long as wide, situated close to each other. Propodeal disc 0.84 x as long as wide, with 3 strong discal carinae; sublateral areas with longitudinal rugae.

Gaster smooth and shining. Middle tibiae not spinose.

Metacarpus vein of forewings obscure.

Holotype. Female, Kurume-shi, Fukuoka Pref., 10.VI.1952, S. Miyamoto leg. [KYU].

Paratypes. 1f, Iwatsuki-shi, Saitama Pref., 24.V.1965, Y. Yoshikawa leg.; 1f, Mt. Kaimon-dake, Kagoshima Pref., 19.VII.1970, Y. Yoshikawa leg. [TE].

Distribution. Honshu, Kyushu.

*Epyris otome* sp. nov.

(Figs. 273, 274, 276)

Japanese name: Otome-arigatabachi.

Holotype. Female. HL 0.90 mm; HW 0.75 mm; FW 0.50 mm; LA 1.55 mm; LPD 0.54 mm; WPD 0.59 mm; FWL 2.1 mm; TL 4.0 mm.

Body black; mandibles and antennae brown except for anterior 2/3 of scape dark brown; coxae blackish brown, middle and hind trochanters yellowish brown, middle and hind femora dark brown, middle and hind tibiae and tarsi yellowish brown.

Head longer than wide, with straight occipital border in frontal view; surface somewhat weakly microreticulate and subopaque, with small shallow punctures coarsely. Mandibles with a sharp teeth. Anterior clypeal margin narrowly rounded. First 5 segments of antennae in a ratio of about 14:3.5:3:4:4.5 in length; 2nd segment as long as wide; 3rd segment slightly wider than long; 4th segment almost as long as wide. Eyes with relatively long hairs, 0.33 mm in length; FW 1.51 x EL. POL:AOL= 8:5; OOL 1.75 x WOT.

Pronotum and mesonotum somewhat weakly microreticulate, with small shallow punctures coarsely as in Fig. 276. Scutellar pits oblique and elliptical, separated by 1.7 x their own maximum diameter. Propodeal disc 0.92 x as long as wide; its maximum width 1.14 x minimum width; 3 discal carinae present; median areas reticulate, lateral areas microreticulate with rugosity.

Gaster smooth and shining. Middle tibiae with several weak spines.



Metacarpus vein of forewings minute.

Holotype. Female, Mt. Sanage-yama, Aichi Pref., 9.X.1970, K. Yamagishi leg. [NIAES].

Paratype. 1f, Mt. Shinbo-dake, Asahi-mura, Niigata Pref., 5.VI.1980, K. Maeto leg. [NIAES].

Distribution. Honshu.

*Epyris surusumi* sp. nov.

(Fig. 275)

Japanese name: Surusumi-arigatabachi.

Holotype. Female. HL 0.85 mm; HW 0.87 mm; FW 0.48 mm; LA 1.55 mm; LPD 0.50 mm; WPD 0.55 mm; FWL 2.9 mm; TL ca. 3.9 mm.

Body black; gaster somewhat brownish; mandibles and antennae reddish brown; legs dark brown except for tarsi medium to light brown.

Head almost as long as wide, with weakly convex occipital border in frontal view; surface microreticulate and moderately punctate. Mandibles with a sharp apical tooth. Anterior margin of clypeus narrowly rounded. First 5 segments of antennae in a ratio of about 14:3.8:2.5:3.5:4 in length; 2nd segment as long as wide; 3rd to 5th segments each slightly wider than long. Eyes with hairs, 0.38 mm in length; FW 1.26 x EL. Frontal angle of ocellar triangle less than a right angle; OOL 2.29 x WOT.

Pronotal dorsum microreticulate, with scattered relatively large punctures. Mesonotum microreticulate, impunctate; scutellar pits round, separated by 3.0 x their own diameter. Propodeal disc 0.91 x as long as wide; 3 discal carinae present, median carina being straight and reaching the transverse carina, and submedian carinae curved inward; basal triangular area strongly reticulate; sublateral areas with strong oblique rugae.

Gaster smooth and shining. Middle tibiae spinose.

Metacarpus vein of forewings short, 0.08 mm in length.

Holotype. Female, Kamiozoegawa, Fuji, Saga Pref., 25.IX.1973, K. Yamagishi leg. [KUF].

Paratypes. 1f, Ohkawachi, Miyazaki Pref., 6.X.1950, Y. Hirashima leg. [KUF]; 1f, Takakuma-yama, Kagoshima Pref., 28.VIII.1970, K. Kusigemati leg. [KU-K]; 1f, Minmaya, Aomori Pref., 25.IX.1993, K. Onoyama leg. [TE].

Distribution. Honshu, Kyushu.

*Epyris tennyo* sp. nov.

(Figs. 275, 277-279)

Japanese name: Tennyo-arigatabachi.

Holotype. Female. HL 1.45 mm; HW 1.45 mm; WF 1.00 mm; LA 2.90 mm; LPD 0.95 mm; WPD 1.05 mm; TL 5.5 mm.

Body black; mandibles reddish brown; antennae reddish brown except for



anterior 3/4 of scape blackish brown; coxae and trochanters blackish brown, tibiae and tarsi reddish brown.

Head as long as wide, densely microreticulate and moderately punctate. Masticate border of mandibles with a large apical tooth and a broad lobe. Anterior border of clypeus triangular. First 5 segments of antennae in a ratio of about 21:5:5:7:7 in length; scape 3.0 x as long as wide; 2nd and 3rd segments each almost as long as wide; 4th and 5th segments each slightly longer than wide. Eyes with erect hairs, 0.55 mm in length; FW 1.8 x EL. POL:AOL = 3:2; OOL 1.72 x WOT.

Pronotal disc 0.79 x as long as wide, moderately microreticulate and punctate; punctures shallow but relatively large. Scutellar pit oblique, elliptical, 3.0 x as long as wide, separated by 2.0 x their own maximum diameter. Propodeal disc almost as long as wide, with straight posterior border; median carina reaching the transverse carina; lateral carinae not reaching posterior border and turned inward posteriorly; median area reticulate; sublateral areas with transverse rugae.

Gaster smooth and shining. Middle tibiae with several short spines.

Metacarpus vein of forewings minute.

Holotype. Female, Hikosan (650 m alt.), Fukuoka Pref., 24.V.1988, K. Yasumatsu leg. [KUF].

Paratypes. 1f, Jozankei, Hokkaido, 23.V.1967, K. Kusigemati leg. [KU-K]; 1f, Fujiwara-machi, Tochigi Pref., 19.V.1985, M. Terayama leg. [TE]; 1f, Yokohama, Kanagawa Pref., 21.V.1933, K. Sato leg. [NASM]; 1f, Ashiu, Kyoto

Pref., 18-19.V.1974, K. Mizuno leg. [NASM]; 2ff, Mt. Ibuki, Shiga Pref., 12.VII.1974, Y. Hori leg. [CNC,TE]; 1f, Mt. Sanage-yama, Aichi Pref., 9.X.1970, K. Yamagishi leg. [MU-Y]; 1f, Mt. Hikosan, Fukuoka Pref., 14.VI.1959, K. Yasumatsu leg. [KUF]; 1f, same locality, 10.VII.1937, K. Yasumatsu leg. [KUF]; 1f, same locality, 13.V.1955, Esaki, Yasumatsu & Hirashima leg., [KUF]; 1f, Mt. Wanizuka, Miyazaki Pref., 23.V.1966, K. Kusigemati leg. [KU-K].

Distribution. Hokkaido, Honshu, Kyushu.



*Epyris formosus* nom. nov.

(Figs. 249-267)

*Epyris apicalis* Walker, 1874. In Smith, Trans. Ent. Soc. London: 402

(based on the female). [*Nec. apicalis* (Motschulsky, 1863).]

*Calyozella sauteri* Enderlein, 1920. Zool. Anz., 51: 25.

*Epyris sauteri*; Krombein, 1992. Proc. Ent. Soc. Washi., 94: 356 (based on the male). Syn. nov.

Japanese name: Kushihiige-arigatabachi. [Tsumaaka-tamagobachi, Matsumura, 1908.]

Redescription of holotype (*Epyris apicalis*). Female. HL 1.90 mm; HW 1.65 mm; WF 1.08 mm; LPD 0.48 mm; WPD 0.63 mm; FWL 3.7 mm; TL ca. 7.5 mm

Body black; mandible dark brown; antennae black, underside brown; legs black; wings subhyaline, tinged with yellowish brown.

Head wider than long as in Fig. 251; surface very weakly microreticulate with punctures densely. Median part of clypeus produced to a small and blunt triangle. Mandibles with 5 teeth, with a dorsal lobe (Fig. 254). First 4 segments of antennae in a ratio of 13:3:3:4 in length; scape 2.6 x as long as wide. Eyes 0.65 mm in length, hairless. OOL 2.8 x WOT; DAO ca. 0.10 mm.

Pronotum as in Figs. 255 & 256. Scutellar pits 0.13 mm in diameters, connected with very shallow groove. Propodeum wider than long with parallel sides and almost straight posterior border; 5 straight discal carinae present; spaces between the carinae with transverse rugae; median area depressed,

lateral areas with transverse rugulae.

Gaster smooth and shining. Metacarpus vein very short.

Redescriptions of holotype male of *Calyoza sauteri*. HL 1.40 mm; HW 1.35 mm; WF 0.90 mm; FWL 0.40 mm; TL 6.5 mm.

Body black; antennal scapes black; funicles reddish yellow; trochanters blackish brown, tibiae and tarsi medium brown; wings subhyaline, tinged with yellowish brown.

General form shown in Fig. 250. Head almost as long as wide, with convex posterior border in frontal view, posterolateral corners not forming an angle; surface weakly microreticulate with punctures medially. Mandibles narrow and triangular, with an acute apical tooth. Clypeus forming an acute angle apically. 4-12 antennal segments pectinate as in Fig. 258; 3rd segment minute, bead-like; first 5 segments in a ratio of about 7:1:0.5:3.5:4 in length. Eyes 0.60 mm in length, glabrous. Ocelli forming a compact triangle.

Pronotal disc 2.0 x as long as width, with shallow punctures moderately. Scutellar pits large and circular, connected by a thin shallow groove. Propodeal disc as in Fig. 261.

Variation. The females vary in head length from 1.25 to 1.85 mm, in head width from 1.30 to 2.15 mm, and in total length from 7.1 to 9.5 mm. In small individuals, the punctures on head and alitrunk smaller and sparser. In the male, the head length varies from 1.36 to 1.60 mm. Some specimens have 2 blunt and very minute teeth followed by an apical tooth. Subgenital plate shown in Fig. 264, and genitalia as in Figs. 265-267.



Material examined. Japan. Japan (labelled "Japan, Type, F. Sm. Coll. 79.22") (holotype, female) [BMNH]; 5f, Ogawa-machi, Saitama Pref., 4.III.1975, M. Okamoto leg.; 2f, Yorii-machi, Saitama Pref., 16.X.1978, T. Nambu leg.; 1f, same locality, 28.X.1979, T. Nambu leg.; 1f, same locality, 15.X.1979, T. Nambu leg.; 1f, Aoyama, Ogawa, Saitama Pref., 16.IV.1993, T. Nambu leg.; 1f, Yoshida-machi, Saitama Pref., 7.VI.1970, T. Nambu leg.; 1f, Kamikawa-mura, Saitama Pref., 16.IX.1968, T. Nambu leg.; 1f, Minano-machi, Saitama Pref., 17.VIII.1984, T. Nambu leg.; 1f, Urayama, Chichibu, Saitama Pref., 30.VII.1979, T. Nambu leg.; 1f, Moriyado, Ogano-machi, Saitama Pref., 6.VII.1988, T. Nambu leg.; 1m, Nakomaeda, Yorii, Saitama Pref., 23.VIII.1985, M. Uchida leg.; 1f, Aoyama, Ogawa-machi, Saitama Pref., 16.IV.1993, T. Nambu leg.; 1f, Mt. Kiyosumi-yama, Chiba Pref., 21.V.1973, Y. Yoshikawa leg.; 1f, Yamazaki, Machida-shi, Tokyo, 5.XI.1970, S. Katsuya leg.; 1f, Iizaka-machi, Fukushima-shi, Fukushima Pref., 7.IX.1968, Miyano leg.; 1f, Inagi-shi, Tokyo, 16.V.1965, S. Katsuya leg.; 1f, Akikawa, Okutama, Tokyo, 5.IV.1965; 1f, Shirahama, Chiba Pref., 28.XII.1979, M. Terayama leg.; 1f, Yokkaichi-shi, Mie Pref., 20.IV.1988, A. Amagasu leg.; 1f, Yasugamori, Yunishi-gawa, Tochigi Pref., 15.VII.1980, K. Nakamura leg.; 1f, Sakashita, Gifu Pref., 14.VII.1972, Y. Yoashikawa leg.; 1f, Shizuoka Pref., 11.VIII.1970, T. Nambu leg.; 1f, Kyoto-shi, Kyoto Pref., 26.VI.1978, W. Suzuki leg.; 1f, Mt. Niyo, Nara Pref., 3.VI.1980, E. Nishida leg.; 2ff, Yokohama, Kanagawa Pref., 21.V.1933, K. Sato leg.; 1f, same locality, 22.V.1933; 1f, same locality, 14.V.1934, K. Sato leg.; 1f, same locality, 8.V.1936; 1f, Hashimoto, Kanagawa Pref., 1.VII.1930.

H. Sugiura leg.; 1f, Minowada, Moroyama-machi Saitama Pref., 14.V.1992, Tamaki leg.; 1f, Mooka-shi, Tochigi Pref., 25.I.1983, M. Terayama leg. 1f, Noborito, Kawasaki-shi, Kanagawa Pref., 21.V.1951, H. Nagase leg.; 1f, Rifu-cho, Miyagi Pref., 5.V.1990, K. Goukon leg.; 1f, Kamiozogawa, Fuji, Saga Pref., 16.VI.1973, K. Yamagishi leg.; 1f, Himeji, Hyogo Pref., 19.I.1954, N. G. leg.; 1f, Tsukumishima, Bungo (Ohita Pref.), 22-23.V.1930, S. Hashimoto leg.; 1f, Odomari, Sata-misaki, Kagoshima Pref., Esaki & Hirashima leg.; 1f, Horaiji, Minamishitara, Aichi Pref., 2.VI.1968, H. Yamada leg.; 1m, Genbara-mura, Ibaraki Pref., 27.VII.1950, K. Sato leg.; 1m1f, Senzu, Shizuoka Pref., 7.IX.1958, J. Minamikawa leg.; 1m, Kyoto Pref., 23.VIII.1961, H. Takeda leg.

Taiwan. 1m, Taihorin, Formosa, H. sauter [DEM; type of *C. sauteri*]; 2m, Mt. Alishan, 10.X.1912, I. Nitobe leg., 1m, Mt. Nanfeng-shan (alt. 1000m), Nr. Liukuei, 21.III.1981, T. Shimomura leg.; 2f, Nanshanchi, nr. Puli, Nantou Hsien, 15.III.1979, A. Shinohara leg.; 1f, Fenchihu, Chayi Hsien, 21.III.1968, T. Okadome leg.

Remarks. *Epyris sauteri* (Enderlein, 1920) described from Taiwan is synonymized with *Epyris apicalis* Walker, 1874 from Japan. However, the name *apicalis* is preoccupied by *E. apicalis* (Motschulsky, 1863), then a new name (*formosus*) proposed.

Ecology. The adult wasps were obtained from spring to fall and some females were collected under the rotten woods in the winter. This suggest that at least females overwinter in adult stage.



*Epyris pectinatus* sp. nov.

(Figs. 311-315)

Japanese name: Edahige-arigatabachi.

Holotype male. HL 0.79 mm; HW 0.79 mm; FW 0.57 mm; LA 1.35 mm; LPD 0.45 mm; WPD 0.63 mm; FWL 2.4 mm; TL ca. 3.6 mm.

Body black; antennae and legs blackish brown.

Head as long as wide, with almost straight posterior border in frontal view, weakly microreticulate and opaque with very shallow and small punctures sparsely. Median lobe of clypeus apically rounded. Antennae with 13 segments; 3rd to 11th segments pectinate; first 5 segments in a ratio of 8:7:6:7:7.5 in length; scape short and wide, 1.6 x as long as wide; 2nd segment cask-shaped, 1.5 x as long as wide; blades of 3rd to 10th segments each longer than shafts; blade of 11th segment shorter than its shaft; 12th segment not pectinate, but broadest at apex; terminal segment clavate. Eyes without hairs, 0.40 mm in length; FW 1.43 x EL. Ocelli large, forming flat triangle; OOL 1.1 x WOT.

Pronotal disc trapezoidal, wider than long, weakly microreticulate. Mesonotum weakly microreticulate; notauli broad, slightly diverging towards the front; scutellar pits elliptical, separated by 1.5 x their own maximum diameter; shallow groove recognizable between them. Propodeum wider than long, 0.71 x as long as wide; median carina straight, reaching the transverse carina; median area reticulate; sublateral areas microreticulate; submedian

and sublateral carinae absent.

Metacarpus vein of forewings absent.

Holotype. Male, Mt. Hikosan, Fukuoka Pref., 3.IX.1958, K. Kamijo leg. [HUS].

Paratypes. 1m, same data as holotype, [HUS]; 1m, Minoo, Osaka Pref., 30.VIII.1958, K. Kamijo leg. [HUS]; 1m, Kobe, Hyogo Pref. [NIAES].

Distribution. Honshu, Kyushu.

Remarks. Known only from the male.



*Epyris blandus* sp. nov.

(Figs. 284, 290)

Japanese name: Tsuya-arigatabachi.

Holotype. Male. HL 1.05 mm; HW 1.03 mm; FW 0.65 mm; LP 1.80 mm; LPD 0.55 mm; WPD 0.83 mm; FWL 3.1 mm; TL 4.5 mm.

Head and alitrunk black; gaster blackish brown; mandibles and antennae medium brown; trochanters brown; tibiae and tarsi yellowish brown.

Head as long as wide, with straight posterior border, microreticulate and relatively coarsely punctate. Mandibles with 2 teeth; apical tooth acute and basal blunt. First 5 segments of antennae in a ratio of 10:5:6:8:8 in length. Anterior border of clypeus triangular. Eyes with short erect hairs, 0.45 mm in length; FW 1.44 x EL. POL:AOL = 8:5; OOL 1.6 x WOP.

Pronotal disc 0.52 x as long as wide; sculpture as in head. Scutellar pits oval, separated by 3.0 x their diameter. Propodeum wider than long, with straight posterior border; median carina not reaching the transverse carina; posterior border of median area U-shaped, not depressed, reticulate; sub-lateral areas with very weakly striate anterior half and smooth and shining posterior half.

Gaster smooth and shining.

Metacarpus veins short, less than the length of pterostigma.

Holotype. Male, Mt. Sanage-yama, Aichi Pref., 9.X.1970, K. Yamagishi leg. [NIAES].

Paratypes. 1m, same data as holotype [MU-Y]; 1m, Mt. Hikosan, Fukuoka Pref., 24-26.X.1979, K. Maeto leg. [NIAES]; 4m, same locality, 3.IX.1958, K. Kamijyo leg. [HUS]; 1m, same locality, 13.IX.1957, S. Momoi leg. [HUS].

Distribution. Honshu, Kyushu.

*Epyris hachijoanus* sp. nov.

(Fig. 292)

Japanese name: Hachijo-hime-arigatabachi.

Holotype. Male. HL 0.63 mm; HW 0.55 mm; FW 0.30 mm; LA 1.05 mm; LPD 0.34 mm; WPD 0.35 mm; FWL 1.65 mm; TL 2.7 mm.

Body black except for tip of mandibles and tarsi brown.

Head 1.14 x as long as wide with convex posterior border; surface coarsely microreticulate, with small and shallow punctures sparsely. Antennae with coarse microreticulation, first 5 segments in a ratio of 5:4.5:4.5:6:7 in length. Anterior border of clypeus triangular. Eyes with short erect hairs sparsely, 0.28 mm in length; FW 1.07 x EL. Ocellar triangle obtuse; OOL 1.57 x WOP.

Pro- and mesonotum microreticulate; notauli parallel; scutellar pits round, separated by 2.0 x their own diameter. Propodeal disc as long as wide with median carina; long submedian carinae absent; surface strongly microreticulate.



Gaster smooth and shining.

Metacarpus vein of forewings short, less than the length of the pterostigma.

Holotype. Male, Bouei-douro, Hachijo-jima I., Tokyo, 15.IX.1990, H. Takahashi leg. [NIAES].

Distribution. Honshu (Hachijo-jima I.).

Remarks. Known only from the type.

*Epyris idaten* sp. nov.

(Fig. 284)

Japanese name: Idaten-arigatabachi.

Holotype. Male. HL 0.78 mm; HW 0.73 mm; WF 0.45 mm; LA 1.70 mm; LPD 0.40 mm; WPD 0.50 mm; FWL 2.4 mm TL 3.9 mm.

Head and alitrunk black; gaster dark castaneous; mandibles yellowish brown; antennae medium to dark brown above, medium brown below; trochanters and anterior half of tibiae dark brown; posterior half of tibiae and tarsi yellowish brown.

Head almost as long as wide with straight posterior border, smooth and shining with shallow punctures sparsely. Median lobe of clypeus triangular; median angle forming a right angle. First 5 segments of antennae in a ratio of 10:3.5:4.6:6 in length. Eyes with short erect hairs, 0.35 mm in length; WF

1.29 x EL. Front angle of ocellar triangle nearly right-angled; OOL 1.5 x WOP.

Pro- and mesonotum microreticulate; notauli parallel; scutellar pits oval, separated by 2.5 x their diameter. Propodeal disc wider than long with weakly concave posterior border; median area reticulate, triangular, with 7-8 longitudinal rugae basally; median carina reaching the transverse carina; sub-lateral areas transversely rugulose.

1st and 2nd gastral tergites smooth and shining; 3rd to 5th weakly microreticulate.

Metacarpus veins long, as long as pterostigma.

Holotype. Male, Iwatsuki-shi, Saitama Pref., 27.VIII.1971, Y. Yoshikawa leg. [NIAES].

Paratypes. 1m, Mt. Kirishima, Kagoshima Pref., 14.III.1953, H. Nagase leg. [TE]; 1m, Takakuma-yama, Kagoshima Pref., 30.VIII.1970, K. Kusigemati leg. [KU-K]; 1f, Mt. Hikosan, Fukuoka Pref., 3.IX.1958, K. Kamijo leg. [HUS].

Distribution. Honshu, Kyushu.

*Epyris minoensis* sp. nov.

(Figs. 291-292)

Japanese name: Mino-hime-arigatabachi.

Holotype. Male. HL 0.58 mm; HW 0.53 mm; FW 0.33 mm; LA 0.95 mm; LPD 0.28 mm; WPD 0.35 mm; FWL 1.6 mm; 2.3 mm.



Head and alitrunk black; gaster dark castaneous; mandibles, antennae, and legs medium brown except fore tibiae and tarsi yellowish brown.

Head slightly longer than wide, with weakly convex posterior border, weakly microreticulate and impunctate. Median lobe of clypeus triangular; apex right-angled. First 5 segments of antennae in a ratio of 4:3.5:3:4:4.5 in length; scape 1.33 x as long as wide. Eyes 0.25 mm in length; with short erect hairs sparsely; FW 1.32 x EL. POL:AOL = 2:1; OOL 1.14 x WOP.

Pronotal disc 0.47 x as long as wide, microreticulate. Mesonotum microreticulate, notauli almost parallel; scutellar pits round, separated by 2.5 x their diameter. Propodeum slightly wider than long, with weakly convex posterior border in dorsal view; median area U-shaped and weakly depressed, weakly reticulate with microreticulation; sublateral areas obliquely striate.

Gaster striate.

Metacarpus veins short, 0.3 x length of pterostigma.

Holotype. Male, Sakashita, Gifu Pref., 14.VII.1972, Y. Yoshikawa leg. [NIAES].

Distribution. Honshu.

Remarks. Known only from the type.

*Epyris niwoh* sp. nov.

(Fig. 289)

Japanese name: Niou-arigatabachi.

Holotype. Male. HL 1.05 mm; HW 1.10 mm; WF 0.70 mm; DPL 0.65 mm; DPW 0.90 mm; FWL 3.8 mm; TL 4.8 mm.

Body black; mandibles reddish brown; antennae brown; coxae and trochanters dark brown; fore tibiae and tarsi yellowish brown; middle and hind tibiae brown except posterior portion yellowish brown; middle and hind tarsi yellowish brown.

Head almost as long as wide, weakly microreticulate and densely punctate; punctures small and shallow, separated by 0.5-1.0 x their own diameter. Mandibles with an acute apical tooth and 4 small blunt teeth. Median lobe of clypeus rather narrow, forming an acute angle. Antennae long, reaching the posterior border of propodeum; first 5 segments in a ratio of about 6:4:5:7:7 in length. Eyes with short erect hairs sparsely, 0.45 mm in length; WF 1.75 x EL. Front angle of ocellar triangle nearly right-angled; OOL 1.33 x WOT.

Pro- and mesonotal dorsum microreticulate and densely punctate; notauli diverging towards the front; scutellar disc oblique and elliptical, separated by 2.0 x their own maximum diameter. Propodeum 0.72 x as long as wide with parallel sides and straight posterior border in dorsal view; median carina reaching the transverse carina; submedian carinae present on distal 1/5 of disc, curved inwards; median area reticulate; lateral areas with oblique



rugae.

Metacarpus veins relatively long, 0.75 x length of pterostigma.

Variation. Available specimens vary in head length from 0.85 to 1.10 mm, and in head width from 0.80 to 1.13 mm.

Holotype, Male, Sapporo, Hokkaido, 17.X.1959, K. Kamijo leg. [HUS].

Paratypes. 1m, Mt. Hikosan, Fukuoka Pref., 24-26.X.1979, K. Maeto leg. [NIAES]; 1m, same locality, 25-26.VII.1979, K. Maeto leg. [NIAES]; 1m, same locality, 3.IX.1958, K. Kamijyo leg. [HUS]; 2m, Betsukari, Mashike, Rumoi, Hokkaido, 20-23.VIII.1971, K. Yamagishi leg. [MU-Y]; 1m, Kyoto Pref., 12.IX.1965, H. Takada leg. [HUS]; 2m, Shiiba, Ohkawauchi, 5.VIII.1970, A. Nagatomi leg. [KU-K]; 1m, Sapporo, Hokkaido, 28.VIII.1964, H. Takada leg. [HUS]; 1m, Shikoktu-ko, Hokkaido, 19.VIII.1964, K. Kusigemati leg. [KU-K]; 1m, Sakura-machi, Ojiya-shi, Niigata Pref., 17.VIII.1970, K. Yamagishi leg. [TE]; 1m, Hikinuma, Shiobara, Tochigi Pref., 20.IX.1985, K. Takahashi leg. [CNC].

Distribution. Hokkaido, Honshu.

*Epyris nubatama* sp. nov.

(Figs. 298-302)

Japanese name: Nubatama-arigatabachi.

Holotype. Male. HL 0.80 mm; HW 0.79 mm; FW 0.45 mm; LA 1.50 mm; LPD 0.45 mm; WPD 0.55 mm; FWL 2.6 mm; TL 3.8 mm.

Body black; mandibles and tarsi blackish brown.

Head as long as wide, with convex posterior border; surface microreticulate with shallow punctures sparsely. Mandibles with an acute apical tooth and 3 blunt small teeth. Anterior border of clypeus rounded and rather weakly produced. First antennal segments in a ratio of 10:4:6:5.5:6 in length; 2nd segment as long as wide, 3rd 1.5 x as long as wide. Eyes 0.40 mm in length, hairless; FW 1.13 x EL. POL:AOL = 1:2; OOL 1.3 x WOP.

Pronotal disc microreticulate, with shallow punctures sparsely. Parapsidal pits oblique, separated by 1.4 x their diameter. Propodeal disc wider than long, 0.82 x as long as wide, with 3 discal carinae; submedian carinae reaching the transverse carina; median area reticulate; submedian areas microreticulate.

Metacarpus veins shorter than pterostigma.

Variation. The head length varies from 0.63 to 0.88 mm.

Holotype, Male, Tamayodo, Yorii-machi, Saitama Pref., 13.VIII.1984, T. Nambu leg. [NIAES].

Paratypes. 9m, same data as holotype [NIAES, NASM, CNC]; 3m, Akahama, Yorii-machi, Saitama Pref., 14.VIII.1984, T. Nambu leg. [TE]; 2m, same locality, 22.VIII.1984, T. Nambu leg. [MCSN, TE]; 5m, same locality, 28.VIII.1984, T. Nambu leg. [TE]; 1m, Yorii, Saitama Pref., 20.VII.1980, T. Nambu leg., [TE]; 1m, same locality, 25.VII.1980, T. Nambu leg. [TE]; 1m, Iwatsuki-shi, Saitama Pref., 26.X.1964, Y. Yoshikawa leg. [TE]; 1m, Yoga, Setagaya-ku, Tokyo, 30.IX.1972, Y. Yoshikawa leg. [TE]; 2m, Momiji-yama, Ishikari, Hokkaido,



5.VIII.1968, T. Nambu leg. [NIAES]; 2m, Osato-cho, Miyagi Pref., 21.VIII.1974, K. Goukon leg. [TE]; 1m, Adachi-cho, Adachi-gun, Fukushima Pref., X.1966, Miyano leg. [TE].

Distribution. Hokkaido, Honshu.

*Epyris showki* sp. nov.

(Figs. 295-297)

Japanese name: Shohki-arigatabachi.

Holotype. Male. HL 0.68 mm; HW 0.68 mm; FW 0.36 mm; LA 1.30 mm; LPD 0.43 mm; WPD 0.45 mm; FWL 2.3 mm; TL 3.2 mm.

Body black; antennae blackish brown; coxae, trochanters and femora brown; anterior half of tibiae brown, and posterior half yellowish brown; tarsi yellowish brown.

Head round, as long as wide with well convex occipital border, posterolateral corners not forming an angle; surface smooth and shining. Eyes with relatively long erect hairs, 0.33 mm in length; FW 1.1 x EL. Anterior border of clypeus triangular, with obtuse apex. Mandibles with an acute apical tooth alone. First 5 antennal segments in a ratio of 7:5:6:7:7 in length; 2nd segment longer than wide; 3rd 2.0 x as long as wide. Ocelli large, forming a right triangle; OOL 1.13 x Oxx; ODA 0.07 mm.

Propodeal disc microreticulate with very shallow punctures sparsely.

Scutellar pits large, separated by a thin lamellar wall. Propodeal disc as long as wide, with 3 discal carinae; submedian carinae reaching the transverse carina; median and sublateral areas with transverse carinae as in Fig. xx/.

Metacarpus vein of forewings long, 1.4 x pterostigma.

Holotype. Male, Mt. Minoo-yama, Osaka-fu, 16.VIII.1972, Y. Yoshikawa leg. [NIAES].

Paratypes. 3m, Nogami, Chichibu, Saitama Pref., 28.VIII.1971, Y. Yoshikawa leg. [TE]; 1m, Toyama Pref., 3.X.1958, S. Takagi leg. [HUS].

Distribution. Honshu.

*Epyris yakushmanus* sp. nov.

(Figs. 293-294)

Japanese name: Yakushima-hime-arigatabachi.

Holotype. Male. HL 0.43 mm; HW 0.43 mm; WF 0.23 mm; LA 0.75 mm; LPD 0.24 mm; WPD 0.26 mm; FWL 1.4 mm.

Body black; legs brown.

Head as long as wide with straight occipital border in frontal view, weakly microreticulate and opaque. Antennae relatively short; scape 0.13 mm in length; 2nd segment as long as wide. Eyes 0.23 mm in length; WF 1.0 x EL. Ocellar triangle with the front angle blunt; OOL 1.2 x WOT.

Pronotal disc moderately microreticulate. Scutellar pits longitudinally



rectangular, separated by a rather thin septum. Propodeal disc slightly wider than long; median and sublateral carinae straight and parallel, sublateral carinae reaching the posterior 1/3; median area microreticulate with transverse rugae; sublateral areas microreticulate.

Metacarpus veins longer than pterostigma.

Holotype. Male, Yoshima, Yakushima I., Kagoshima Pref., 8.VII.1970, K. Yamagishi leg. [NIAES].

Distribution. Yakushima I.

Remarks. Known only from the holotype.

*Epyris yamatonis* sp. nov.

(Figs. 303-310)

Japanese name: Yamato-hime-arigatabachi.

Holotype. Male, HL 0.70 mm; HW 0.70 mm; FW 0.43 mm; LA 1.45 mm; LPD 0.38 mm; WPD 0.63 mm; FWL 2.1 mm; TL 3.8 mm.

Head and alitrunk black; 1st and 2nd tergites of gaster dark brown, the other segments black; mandibles and legs dark brown.

Head round, as long as wide with convex occipital border in frontal view; posterolateral corners not forming an angle; surface microreticulate and moderately punctate. Mandibles with a large apical tooth and small subapical tooth. Anterior border of clypeus round. First 5 antennal segments in a ratio

of 8:3:4:6:6 in length; 2nd segment as long as wide; 3rd segment 1.25 x as long as wide. Eyes with erect hairs, 0.30 mm in length; FW 1.43 x EL. Ocellar triangle forming a obtuse angle; OOL 1.1 x WOP.

Pronotal disc microreticulate and moderately punctate; puncturation finer than on head. Scutellar pits each wider than long, separated by a rather thin septum. Propodeal disc wider than long, broadest at posterior end, with concave posterior border in dorsal view; 3 discal carinae present which are reaching the transverse carina; median area with 2 weak longitudinal carinae and with transverse rugae; sublateral areas with transverse rugae; sublateral carinae distinct; lateral areas with transverse rugae.

Metacarpus vein very short.

Variation. Head length varies from 0.53 to 0.80 mm. In small individuals, the inner submedian rugae and transverse rugae on sublateral areas of propodeum are indistinct.

Holotype. Male, Iwatsuki-shi, Saitama Pref., 29.VII.1971, Y. Yoshikawa leg. [NIAES].

Paratypes. 10m, same data as holotype [NIAES, NASM, TE]; 11m, same locality, 30.VII.1971, Y. Yoshikawa leg. [NIAES, TE]; 1m, same locality, 27.VIII.1971, Y. Yoshikawa leg., [CNC]; 1m, same locality, 21.VII.1966, Y. Yoshikawa leg. [TE]; 2m, same locality, 31.VIII.1964, Y. Yoshikawa leg. [TE]; 1m, same locality, 29.VIII.1964, Y. Yoshikawa leg. [TE]; 3m, Yoga, Setagaya, Tokyo, 2.X.1972, Y. Yoshikawa leg. [TE]; 2m, same locality, 13.X.1972, Y. Yoshikawa leg. [TE]; 2m, same locality, 5.X.1972, Y. Yoshikawa leg. [TE]; 1m, same locality, 7.X.1972,



Y. Yoshikawa leg. [TE]; 1m, same locality, 30.IX.1972. Y. Yoshikawa leg. [TE]; 1m, Takefu-shi, Fukui Pref., 22.VII.1956. Y. Murakami leg. [KUF]; 3m, Mt. Kanagurayama, Ojiya-shi, Niigata Pref., 19.VIII.1970. K. Yamagishi leg. [MU-Y]; 5m, Ikuta, Kawasaki, Kanagawa Pref., 5.IX.1972. Y. Yoshikawa leg. [TE]; 1m, same locality, 3.VII.1972. Y. Yoshikawa leg. [TE]; 1m, Shimonoseki, Yamaguchi Pref., 22.VIII.1930. K. Yasumatsu leg. [KUF]; 1m, Inagi, Tokyo, 15.VIII.1968. S. Katsuya leg. [TE]; 1m, Nishiyama, Syuso, Ehime Pref., 17.VIII.1954. H. Tokunaga leg. [EUM]; 1m, Yokohama, Kanagawa Pref., IX.1941. K. Sato leg. [NASM]; 1m, Miho, Shizuoka Pref., 25.XI.1933. K. Sato leg. [NASM]; 2m, Sugidate, Ehime Pref., 6.VIII.1972. Y. Yoshikawa leg. [TE]; 2m, Nogami, Chichibu, Saitama Pref., 28.VIII.1971. Y. Yoshikawa leg. [TE]; 1m, Kado-dake, Amakusa, Nagasaki Pref., 13.VII.1961. Hidaka & Azim leg. [KUF]; 2m, Kaimon-dake, Kagoshima Pref., 19.VII.1971. Y. Yoshikawa leg. [TE]; 1m, Nagata, Yaku-shima I., Kagoshima Pref., 9.VII.1973. K. Kusigemati leg. [KU-K]; 1m, Ohara, Iriomote I., Okinawa Pref., 17.III.1973. H. Hasegawa leg. [NIAES].

Distribution. Honshu, Shikoku, Kyushu, Yakushima I., Ryukyus.

#### Genus *Holepyris* Kieffer

- Holepyris* Kieffer, 1904. Ann. Mus. Civ. Stor. Nat. Genova, 41: 390.  
*Rysepyris* Kieffer, 1906. In Andr. Spec. Hymen. Eur. Alger., 9: 341. [Synonymized by Evans, 1964.]  
*Misepyris* Kieffer, 1913. Boll. Lab. Zool. Portici, 7: 108. [Synonymized by Evans, 1964.]  
*Parepyris* Brethes, 1913. An. Mus. Nac. Hist. Nat. Buenos Aires, 24: 87. [Synonymized by Evans, 1964.]  
Japanese name: Maedate-arigatabachi.

Diagnosis. Medium to small wasps with the following combination of characteristics.

1. PF = 6, 3.
2. Median lobe of clypeus large.
3. Lateral lobes of clypeus large and rounded.
4. Eyes with long erect hairs, but in some species hairs short.
5. Pronotum much longer than mesoscutum.
6. Notauli very thin, usually incomplete.
7. Scutellum with a transverse groove at base.
8. Pterostigma small.
9. Radial vein long.
10. Basal vein reaching subcosta basad of stigma by approximately the length of the pterostigma.



Key to the Japanese species of *Holepyris*

(Female)

1. Subcosta and median vein of fore wings with long erect hairs .....  
.....*H. tsugarensis* sp. nov. [Hon]
- Wing veins without long erect hairs .....2
2. Median lobe of clypeus round (Fig. 320); posterolateral borders of head round, not forming a distinct angle .....  
.....*H. atamiensis* Ashmead [Hon, Shi, Kyu, Ryu]
- Median lobe of clypeus triangular (Fig. 322); posterolateral borders of head forming a distinct angle in frontal view .....3
3. Propodeum elongate; disc almost as long as width .....  
.....*H. amamiinsulanus* sp. nov. [Amami]
- Propodeum shorter; disc 0.9 x as long as width .....  
.....*H. benten* sp. nov. [Hon]

(Male)

1. Propodeum with 5 discal carinae; submedian carinae reaching the transverse carina .....2
- Propodeum with 3 discal carinae; submedian carinae not reaching the transverse carina .....*H. yambaru* sp. nov. [Ryu]
2. Anterolateral border of head angulate; occipital border almost straight

to weakly concave; tip of median lobe pointed .....

..... *H. yebis* sp. nov. [Hon]

- Anterolateral border of head round; occipital border weakly convex; tip of median lobe dully rounded.....  
.....*H. atamiensis* Ashmead [Hon, Shi, Kyu, Ryu]

*Holepyris amamiinsulanus* sp. nov.

(Fig. 323)

Japanese name: Amami-maedate-arigatabachi.

Holotype. Female. HL 0.83 mm; HW 0.74 mm; WF 0.45 mm; AL 1.60 mm; LPD 0.45 mm; WPD 0.50 mm; FWL 2.5 mm; TL 4.1 mm.

Body black; mandibles, antennae and legs brown.

Head 1.12 x as long as wide with straight posterior border, surface coarsely microreticulate with small punctures densely. Mandibles slender, with an apical tooth. Median lobe of clypeus rather narrow, forming an acute angle. Lateral lobe with an angle at inner portion. First 5 segments of antennae in a ratio of 16:6:4:4.5:5 in length; scape broadest at posterior end, 2.67 x as long as wide; 2nd segment slightly longer than wide; 3rd to 5th segments each as long as wide. Eyes 0.30 mm in length; WF 1.5 x EL. Ocelli forming a compact triangle; OOL 1.5 x WOP.

Pro- and mesonotum microreticulate with very weak punctures sparsely.



Propodeal disc 0.90 x as long as wide, with 5 discal carinae; submedian carinae almost parallel, reaching the transverse carinae.

Holotype. Female. Amami-oshima I., Kagoshima Pref., 8.V.1966. K. Kusigemati leg. [NIAES].

Paratype. 1f, same locality, 9.V.1966. K. Kusigemati leg. [KU-K].

Distribution. Amami Is.

*Holepyris atamiensis* (Ashmead, 1904)

(Figs. 317-322, 325-326, 333-334)

*Epyris atamiensis* Ashmead, 1904. Jour. New York Ent. Soc., 12: 67.

*Holepyris atamiensis*: Kieffer, 1908. Genera Insectorum, 76: 29.

Japanese name: Atami-arigatabachi. [Atami-arigatabachi, Tachikawa, 1985.]

Holotype. Female. HL 0.75 mm; HW 0.58 mm; LA 1.23 mm; FWL 1.9 mm; TL ca. 3.5 mm.

Body black; mandibles brown; antennae brown except for anterior 2/3 of scape black; legs brown.

Head as in Fig. 327; posterior border almost straight in frontal view. Mandibles with an acute apical tooth. Median lobe of clypeus rounded, not forming an angle; lateral lobes broadly rounded. Antennae with 13 segments; first 5 segments in a ratio of 13:4:3:3:3 in length; scape long, 3.0 x as long as

wide, with parallel sides; 2nd segment slightly longer than wide; 3rd segments slightly wider than long; terminal segment 3.3 x as long as wide. Eyes 0.24 mm in length; the longest hairs on eyes ca. 0.04 mm long. DOA: POA = 1:1; OOL 2.45 x WOT.

Pronotal disc as in Fig. 331. 0.50 mm in maximum width seen from above. Propodeal disc with straight 5 discal carinae; sublateral areas with transverse rugae.

Male. HL 0.90-0.94 mm; HW 0.83-0.85 mm; FW 0.55-0.58 mm; LA 1.60-1.72 mm; LPD 0.60-0.63 mm; WPD 0.58-0.60 mm; FWL 2.8-2.9 mm; TL 3.8-4.1 mm. (5 individuals were measured.)

Body black; mandibles brown; antennae black except for 2nd segment and anterior half of 3rd segment brown; coxae and femora dark brown; tibiae and tarsi brown.

Head slightly longer than wide with straight posterior border in frontal view; surface microreticulate with shallow punctures coarsely. Mandibles slender, with an acute apical tooth. Median lobe of clypeus subtriangular, but not forming an angle at midlength. Antennal funicular segments long; length of 3rd to 10th segments each more than 2.5 x their width; scape short. Eyes 0.38 mm in length.

Propodeal disc with 5 discal carinae; submedian carinae not reaching the transverse carina.

Variation. Ten females with the following measurements: HL 0.70-0.78 mm; HW 0.51-0.61 mm; WF mm; LA 0.54-0.62 mm; LPD 0.56-0.62 mm; WPD 0.56-0.60 mm;



FWL 1.8-2.2 mm; TL 3.4-3.9 mm.

Material examined. Japan. Atami, Japan, Koebele leg. (holotype, female)[Type No. 7110, USNM]; 1f, Mt. Ohboshi, Mine, Tsushima I., Nagasaki Pref., 22-24.VI.1985, H. Makihara leg.; 1f, same locality, 20-23.V.1984, A. Saitoh leg.; 1f, Machida-shi, Tokyo, 14.IX.1983, T. Niisato leg.; 1f, Ogawa-machi, Saitama Pref., 3.VII.1971, T. Nambu leg.; 1f, Mt. Fugen-dake, Unzen, Nagasaki Pref., 25.IX.1983, K. Konishi leg.; 1f, Miike, Takaharu-machi, Miyazaki Pref., 20.V.1982, H. Takemoto leg.; 3f, 2m, Kamiozogawa, Fuji, Saga Pref., 10.VIII.1973, K. Yamagishi leg.; 3f, 1m, same locality, 25.IX.1973, K. Yamagishi leg.; 1f, same locality, 9.X.1973, K. Yamagishi leg.; 3f, Mt. Sanage-yama, Aichi Pref., 23.IX.1970, K. Yamagishi leg., (ex. Berlese funnel); 1f, same locality, 14.XII.1969, K. Yamagishi leg., (ex. Berlese funnel); 1f, Mt. Hiko-san, Fukuoka Pref., 18.VIII.1941, K. Yasumatsu leg.; 2f, same locality, 21.VI.1956, Y. Murakami leg.; 2f, same locality, 13.V.1955, Esaki, Yasumatsu & Hirashima leg.; 1f, same locality, 18.V.1950, Y. Hirashima leg.; 1f, same locality, 14.VI.1959, K. Yasumatsu leg.; 1f, same locality, 3.VI.1957, T. Kumata leg.; 1f, same locality, 5.VII.1939, K. Yasumatsu leg.; 1f, 1m, same locality, 25-26.VII.1979, K. Maeto leg.; 1f, Mt. Wakakusa-yama, Fukuoka Pref., 2.VI.1940, T. Shirozu leg.; 1f, 1m, Mt. Kunimi, Kagoshima Pref., 8.VIII.1947, Esaki, Yasumatsu & Shirozu leg.; 1f, Cape sata, Kagoshima Pref., 1.V.1962, F. Nakasuji leg.; 1f, Shimizu, Kochi Pref., 27.IV.1955, Y. Murakami leg.; 1f, Murotozaki, Kochi Pref., 16-18.VII.1952, S. Miyamoto leg.; 1f, Mt. Mitate, Tsushima I., Nagasaki Pref., 3.V.1989, K. Konishi leg.; 3ff,

Budouzawa, Mts. Iide, Yamagata Pref., 19.VI.1988, K. Konishi leg.; 1f, same locality, 29-30.VI.1987, K. Konishi leg.; 1f, Hirao, Fukuoka-shi, Fukuoka Pref., 2.VI.1956, K. Morimoto leg.; 1f, Atsugi-shi, Kanagawa Pref., 22.XI.1971, S. Okajima leg., (ex. Berlese funnel); 1f, Ogose-machi, Saitama Pref., 6.XII.1976, T. Nambu leg., (ex. Berlese funnel); 1f, Yokkaichi-shi, Mie Pref., 20.II.1990, A. Amagasu leg., (ex. Berlese funnel); 1f, same locality, 26.IV.1988, A. Amagasu leg.; 1f, Kiinagashima, Mie Pref., 26.II.1987, A. Kawazoe leg.; 1f, Miike, Takaharu-machi, Miyazaki Pref., H. Takemoto leg.; 1f, Mt. Eboshi-dake, Kagoshima Pref., 4.V.1969, K. Kusigemati leg.; 1f, Kagoshima Pref., 15.V.1966, K. Kusigemati leg.; 1f, Terayama, Kagoshima Pref., 8.V.1970, K. Kusigemati leg.; 1f, Takakuma-yama, Kagoshima Pref., 28.VIII.1970, K. Kusigemati leg.; 1f, Mt. Wanizuka, Miyazaki Pref., 23.V.1966, K. Kusigemati leg.; 1f, Shimura, 18.V.1935, H. Yuasa leg.; 1f, Mt. Takatori, Kobe, Hyogo Pref., 5.VI.1978; 1f, Takachiho, Mts. Kirishima, Kagoshima Pref., 4.VI.1973, Y. Minami leg.; 1f, Mt. Kiyosumi-yama, Chiba Pref., 21.V.1973, Y. Yoshikawa leg.; 1f, Kawazu, Shizuoka Pref., 13.VI.1928, K. Sato leg.; 1f, Mt. Takanawa, Ehime Pref., 19.V.1956, M. Miyatake leg.; 1f, Ashiu, Kyoto Pref., 15.VI.1975, K. Mizuno leg.; 1f, Yaita, Tochigi Pref., 30.VII.-15.VII.1989, K. Konishi leg., (by Malaise trap); 1f, Mt. Unzen, Nagasaki Pref., 25.IX.1983, K. Konishi leg.; 1f, 1m, 22.VIII.1983, Minato-ku, Tokyo, Seno leg.; 1f, Ohdomari, Kagoshima Pref., 20.VII. 1970, Y. Yoshikawa leg.; 1f, Kurio, Yakushima I., Kagoshima Pref., 13.VII.1970, K. Yamagishi leg.; 1f, Bomisaki, Kagoshima Pref., 27.IV.1966, K. Kusigemati leg.; 1f, Shiiba, Ohkawauchi, Kagoshima



Pref., 4.VIII.1970, A. Nagatomi leg.; 1f, Sata-cho, Kagoshima Pref., 10.VI.1979, H. Nagase leg.; 1f, 1m, Omogo-kei, Ehime Pref., 3.X.1957, S. Momoi leg.; 2m, same locality, 4.X.1967, S. Momoi leg.; 1m, Mt. Takakuma, Kagoshima Pref., 13.IX.1958, K. Kamijo leg.; 1m, Mt. Haguro-san, Yamagata Pref., 3.IX.1966, K. Kusigemati leg.; 1m, Kinsa-ko, Ehime Pref., 1.VIII.1972, Y. Yoshikawa leg.; 1m, Iwatsuki-shi, Saitama Pref., 29.VIII.1971, Y. Yoshimawa leg.; 1m, Ikuta, Kawasaki-shi, Kanagawa Pref., 8.IX.1972, Y. Yoshikawa leg.; 1m, Terayama, Kagoshima Pref., 1.V.1970, K. Kusigemati leg.; 1m, Kyoto-shi, Kyoto Pref., 13.VIII.1961, H. Takada leg.; 1m, Saitsu, Amakusa, Kumamoto Pref., 4.X.1960, K. Yano leg.; 1m, Mt. Takao-san, Tokyo, 20.VIII.1987, K. Konishi leg.; 1m, Asakawa, Tokyo, 19.VIII.1987, K. Konishi leg.; 1m, Mt. Haku-san, Ishikawa Pref., 23.VIII.1973, T. Nambu leg.; 1m, Jusantsukabaru, Kagoshima Pref., 19.VII.1974, K. Kusigemati leg.; 2f, Amami-oshima I., Kagoshima Pref., 8.V.1966, K. Kusigemati leg.; 1f, same locality, 9.V.1966, K. Kusigemati leg.; 3f, same locality, 24.V.1965, H. Takada leg.; 1m, same locality, 11.XI.1962, Y. Miyatake leg.; Mt. Yuwan-dake, Amami-oshima I., Kagoshima Pref., 1-VII-1983, M. Terayama leg.

Taiwan. 1f, Nanshanchi, nr. Puli, Nantou Hsien, 15.III.1979, A. Shinohara leg.; 1f, Siji, Yilan Hsien (800 m alt.), 29.VII.1988; 1f, Fuisunlinchang, Nantou Hsien (600 m alt.), 31.VII.1988.

Distribution. Japan (Honshu, Shikoku, Kyushu, Tsushima I., Yakushima I., Amami-Oshima I.), Taiwan (new record).

Remarks. The male was also described for the first time. The females were

often collected by the Berlese funnel from late fall to early spring.

*Holepyris benten* sp. nov.

(Figs. 327-328)

Japanese name: Benten-arigatabachi.

Holotype. Female. HL 0.93 mm; HW 0.78 mm; FW 0.50 mm; LA 1.65 mm; LPD 0.55 mm; WPD 0.63 mm; FWL 2.6 mm; TL 4.8 mm.

Black in color; mandibles brown; antennae brown except for anterior 2/5 black; coxae and femora medium to dark brown, tibiae and tarsi yellowish brown.

Head longer than wide with straight occipital border in frontal view, coarsely microreticulate with very shallow punctures. Mandibles slender with an apical tooth. Median lobe of clypeus triangular. First 5 segments of antennae in a ratio of 16:5:4.5:4.5:4 in length; scape long, with parallel sides; 2nd segment as long as wide. Eyes 0.33 mm in length; FW 1.52 x EL.

Puncturation on pro- and mesonotum as in head. Propodeal disc wider than long, 0.87 x as long as wide; 5 discal carinae present; median area with transverse rugae; sublateral areas with oblique rugae.

Holotype. Female. Mt. Kiyosumi-yama, Chiba Pref., 7.XI.1972, Y. Watanabe leg. [NIAES].

Paratypes. 1f, Kawama, Noda-shi, Saitama Pref., 24.VIII.1964, Y. Yoshikawa



leg. [NIAES]; 1f. Tama Hill, Kanagawa Pref., 1976, A. Yoshitani leg. [NIAES]; 1f. Nagaoka, Utsunomiya-shi, Tochigi Pref., 26. IV. 1980, K. Nakamura leg. [NIAES]; 1f. Nakaizu-machi, Shizuoka Pref., 10. X. 1993, M. Terayama leg., [TE]; 1f. Nansei-machi, Mie Pref., 29. XI. 1989, A. Amagasu leg. [MCSN]; 1f. Mt. Takatori, Kobe, Hyogo Pref., 21. VI. 1978, [MNHA]; 1f. Mt. Tebako, Kochi Pref., 7-10. VIII. 1957, K. Morimoto leg. [KUF]; 2f. Mt. Hikosan, Fukuoka Pref., 21. VI. 1956, Y. Murakami leg. [KUF]; 1f. same locality, 10. X. 1937, K. Yasumatsu leg., [KUF]; 2f. Terayama, Kagoshima Pref., 25. VIII. 1970, K. Kusigemati leg., [KU-K].

Distribution. Honshu, Shikoku, Kyushu.

*Holepyris tsugaruensis* sp. nov.

(Figs. 323-326)

Japanese name: Tsugaru-arigatabachi.

Holotype. Female, HL 0.88 mm; HW 0.78 mm; WF 0.53 mm; LA 1.58 mm; LPD 0.58 mm; WPD 0.48 mm; FWL 1.8 mm; TL 4.5 mm.

Body black; mandibles blackish brown to dark brown; anterior half of median lobe of clypeus dark reddish brown; antennae reddish brown except for basal half blackish brown; legs brown.

Head 1.12 x as long as wide, with almost straight posterior border and dully angulated postero-lateral borders in frontal view; surface strongly

microreticulate with coarsely punctate. Mandibles with 2 rather small teeth at apices; apicalmost tooth blunt and smaller. Median lobe of clypeus roundly produced. First 5 segments of antennae in a ratio of 17:5:4:4:4 in length; scape 2.8 x as long as maximum width; 2nd segment slightly longer than wide; 3rd to 5th segments each slightly wider than long. Eyes 0.37 mm in length; WF 1.43 x EL. Ocelli small; front angle of ocellar triangle rather acute; POL:AOL = 1:1; OOL 2.2 x WOT.

Pronotal disc 0.83 x as long as wide; two transverse carinae present at anterior margin and posterior portion; surface as in head. Mesonotum strongly microreticulate; punctures small and sparser than those on pronotum. Mesonotal groove deep, 2.7 x as long as wide. Propodeal disc 1.2 x as long as wide, broadest near posterior end, with 3 distinct discal carinae; each median area striate with a weak longitudinal ruga; sublateral carinae strong; lateral areas striate.

Gaster smooth and shining. Forewings somewhat short, 1.14 x as long as alitrik; venation as in Fig. 326; costa reduced; subcosta with about 10 long erect hairs; median with 5 long erect hairs which are longer than the maximum width of median cell; anal vein with 2 long erect hairs.

Holotype. Female, Imabetsu-machi, Aomori Pref., 25. IX. 1993, K. Onoyama leg. [NIAES].

Paratype. 1f. Mt. Buko-zan (alt. 670 m), Chichibu, Saitama Pref., 15. IX. 1993, M. Uchida leg. [TE].

Remarks. Known from the 2 individuals only, both collected in leaf litter



layer on the ground.

*Holepyris yebis* sp. nov.

(Figs. 331-332)

Japanese name: Ebis-arigatabachi.

Holotype. Male. HL 0.83 mm; HW 0.83 mm; FW 0.48 mm; LA 1.65 mm; LPD 0.45 mm; WPD 0.63 mm; FWL 2.7 mm; TL 4.0 mm.

Body black; antennae dark brown; legs dark to medium brown.

Head as long as wide, with concave occipital border in frontal view; surface coarsely microreticulate with shallow punctures densely. Mandibles with an apical tooth. Median lobe of clypeus triangular; median portion strongly angulate; lateral lobes with an inner angle and a outer angle. Antennae long; first 5 segments in a ratio of 9:6:8:9:9 in length; 2nd segment 1.7 x as long as wide; 3rd segment 2.0 x as long as wide. Eyes 0.38 mm in length; FW 1.26 x EL. Ocelli forming flat triangle; OOL 1.2 x WOT.

Pronotal disc coarsely microreticulate with shallow punctures; punctures sparser than on head. Propodeal disc wider than long, 0.71 x as long as wide, with 5 discal carinae; median area with transverse rugae.

Holotype. Male, Kamiozoegawa, Fuji, Saga Pref., 25. IX. 1973, K. Yamagishi leg. [KUF].

Paratypes. 1m, same data as holotype [KYU]; 1m, same locality as holotype.

10. VIII. 1973, K. Yamagishi leg. [KYU]; 1m, Inagi-shi, Tokyo, 15. VIII. 1968, S. Katsuya leg., [NIAES]; 1f, Takakuma-yama, Kagoshima Pref., 28. VIII. 1970, K. Kusigemati leg. [KU-K].

Distribution. Honsyu, Kyushu.

Remarks. It is highly probable that this species is conspecific with *H. benten*, because of the resemblance of external morphology and distribution. However, I tentatively treat them as separate species until male-female relations are confirmed.

*Holepyris yambaru* sp. nov.

(Fig. 324)

Japanese name: Yambaru-maedate-arigatabachi.

Holotype. Male. HL 0.65 mm; HW 0.63 mm; WF 0.33 mm; LA 1.20 mm; LPD 0.40 mm; WPD 0.41 mm; FWL 2.2 mm; TL 2.7 mm.

Body black; gaster dark blackish brown; legs brown.

Head as long as wide, with weakly convex posterior border in frontal view, microreticulate. Median lobe of clypeus triangular, with dull median angle. First 5 segments of antennae in a ratio of 7:6:7:7:7 in length. Eyes 0.30 mm in length; WF 1.1 x EL. Front angle of ocellar triangle obtuse. OOL 1.0 x WOT.

Pro- and mesonotal dorsum microreticulate. Propodeal disc as long as wide;



broadest at posterior 1/5 in dorsal view; median carina reaching the transverse carina, 2 pairs of submedian carinae present in basal half of disc; median and sublateral areas with transverse rugae.

Variation. The specimen from Ishigaki-jima I. is distinctly small, with the following measurements: HL 0.55 mm; HW 0.50 mm; FW 0.30 mm; LA 0.95 mm; LPD 0.35 mm; WPD 0.33 mm; FWL 1.8 mm; TL 2.3 mm.

Holotype. Male, 10-11.X.1988, Kunigami-son, Okinawa-jima I., Okinawa Pref., K. Konishi leg. [NIAES].

Paratypes. 3m, same data as holotype [NIAES]; 2m, Mt. Yonaha-dake, Okinawa-jima I., Okinawa Pref., 12.VII.1977, H. Makihara leg. [KUF]; 1m, Uebaru, Nakijin, Okinawa-jima I., Okinawa Pref., 1.V.1991, M. Hayashi leg. [NIAES]; 1m, Kawarayama, Ishigaki-jima I., Okinawa Pref., 12.XI.1963, H. Hasegawa leg. [NIAES]; 3m, Mt. Yuwan-dake, Amami-oshima I., Kagoshima Pref., 25. VI. 1971, M. Chujo leg. [KUF]; 1m, Hatsuno, Amami-oshima I., Kagoshima Pref., 11.XI.1962, Y. Miyatake leg. [KUF].

Distribution. Ryukyus.

Remarks. Female unknown.

Genus *Laelius* Ashmead

*Laelius* Ashmead, 1893. Bull. U.S. Nat. Mus., 45: 50.

*Paralaelius* Kieffer, 1905. Ann. Soc. Sci. Bruxelles, 29: 129. [Synonymized by Musebeck & Walkley, 1951.]

*Allepyris* Kieffer, 1905. Ann. Soc. Sci. Bruxelles, 29: 106. [Provisinally synonymized by Perkins, 1976; Synonymized by Terayama in the part I of this article.]

Japanese name: Arage-arigatabachi-zoku.

Diagnosis. Small wasps with the following combination of characteristics.

1. PF = 6.3.
2. Clypeus with a median lobe.
3. Antennae with 13 segments.
4. Notauli not or only weakly indicated.
5. Scutellum with a transverse groove at base.
6. Propodeum with lateral and transverse carinae.
7. Pterostigma small.
8. Radial vein short, shorter than median vein.



Key to the Japanese species of *Laelius*

(Female)

1. Legs yellow to reddish yellow .....2  
- Fore trochanters and femora, middle and hind legs blackish brown .....  
.....*L. nigrofemoratus* sp. nov. [Hon]
2. Propodeum with 5 discal carinae; antennal scapes and 2nd antennal segments yellow ..... *L. yamatonis* sp. nov. [Hon, Shi, Kyu]  
- Propodeum with 7 discal carinae; antennal scapes and 2nd antennal segments reddish yellow ..... *L. yokohamensis* sp. nov. [Hon]

*Laelius nigrofemoratus* sp. nov.

(Figs. 347-348, 358, 360, 362)

Japanese name: Ashiguro-arage-arigatabachi

Holotype. Female. HL 0.73 mm; HW 0.73 mm; FW 0.44 mm; LA 1.30 mm; LPD 0.45 mm; WPD 0.55 mm; FWL 2.15 mm; TL 3.5 mm.

Head, alitrunk and gaster black; mandibles and antennal scapes blackish brown; 2nd and 3rd segments of antennae brown, 4th to apical segments blackish brown; fore coxae, trochanters and femora blackish brown, trochanters somewhat yellowish; fore tibiae and tarsi yellowish brown; middle and hind legs blackish brown. Wings hyaline; veins and stigma pale brownish yellow.

Head almost as long as wide, HW 1.66 x FW, microreticulate; the longest

hair of occipit ca. 0.15 mm. Mandibles with 5 teeth. Anterior border of clypeus roundly produced. First 5 antennal segments in a ratio of about 9:3.5:3:3:3 in length; 2nd segments 1.4 x as long as wide; 3rd segment 1.2 x as long as wide. Eyes 0.28 mm in maximum diameter; FW 1.57 x EL. Frontal angle of ocellar triangle obtuse; POL:AOL = 8:6; OOL 1.0 x WOT.

Pronotal disc trapezoidal; maximum width 1.57 x minimum width; anterior border almost straight, microreticulate. Mesonotum microreticulate, scutellum with an anterior groove. Propodeal disc 0.82 x as long as wide, with almost parallel sides and weakly convex posterior border in dorsal view. 7 discal carinae present; outermost reaching 0.38 x length of the disc; inner 5 carinae reaching transverse carina; surface with transverse rugae.

Gaster smooth and shining. Subcosta, median and anal veins with erect or suberect long hairs; radial cells 2.0 x length of pterostigma.

Holotype. Female, 1f, Kawagoe, Saitama Pref., 1. IV. 1974, T. Nambu leg. [NIAES].

Paratypes. Kitain, Kawagoe-shi, Saitama Pref., 15. VI. 1974, T. Nambu leg. [NIAES]; 3f, Nohara, Konan, Saitama Pref., 15. IX. 1993, T. Nambu leg. [TE]; 1f, Adachi-machi, Adachi-gun, Fukushima Pref., 14. VIII. 1963, Miyano leg. [TE]; 1f, Ohsugidani, Shiramine-mura, Ishikawa Pref., 30. VII. 1991, I. Togashi leg. [TE]; 1f, Itabashi-ku, Tokyo, 30. VII. 1985, T. Niisato leg. [TE]; 1f, Nishiogikubo, Tokyo, 8. VII. 1930, M. Kawai leg. [NASM]; 3f, Mt. Kinkazan, Gifu-shi, Gifu Pref., 17. VI. 1971, H. Yamada leg. [NIAES, TE]; 2f, Mt. Sanage-yama, Toyota, Aichi Pref., 13. VI. 1971, H. Yamada leg. [MU-Y]; 1f, Kounji, Akazu, Seto, Aichi



Pref., 6.VI.1971, H. Yamada leg. [MU-Y]; 1f. Fukuoka, Fukuoka Pref.,  
15.III.1930, Esaki, Hori, Yasumatsu & Fujino leg. [KUF].

Distribution. Honsyu, Kyushu.

*Laelius yamatonis* sp. nov.

(Figs. 349-353, 359)

*Allepyris microneurus*: Iwata, 1941, Kontyu, 15: 51. [Misidentification.]

*Laelius microneurus*: Tachikawa, 1980, Agriculture and Horticulture, 55:1132.

[Misidentification.]

Japanese name: Kiashi-arigatabachi. [Kiashi-arigatabachi, Iwata, 1941.]

Holotype. Female. HL 0.59 mm; HW 0.54 mm; FW 0.35 mm; LA 0.98 mm; LPD 0.33  
mm; WPD 0.40 mm; FWL 1.43 mm; TL 2.8 mm.

Head, alitrunk and gaster black; mandibles yellow; antennal scapes and 2nd  
antennal segment yellow; other segments brown; legs yellow; wings hyaline;  
veins and stigma pale yellow.

Head slightly longer than wide, HW 1.54 x FW; surface microreticulate;  
longest hair on the posterolateral borders ca. 0.13 mm long. Mandibles with 5  
teeth; apical 2 larger and basal 3 small. Anterior border of clypeus rounded.  
First 5 segments of antennae in a ratio of about 16:7:5:7:8; 2nd segment 1.8 x  
as long as wide; 3rd 1.4 x as long as wide. Eyes convex, 0.20 mm in maximum  
diameter; FW 2.4 x EL. anterior angle of ocellar triangle slightly obtuse.

POL:AOL = 13:10; OOL 1.23 x WOT.

Pronotal disc 0.52 x as long as maximum width; seen from above, maximum  
width 1.72 x minimum width; disc microreticulate. Mesonotum microreticulate;  
scutellum with a groove anteriorly. Propodeal disc 0.83 x as long as wide;  
maximum width 1.23 x posteriormost width; posterior border moderately concave;  
5 discal carinae present; median and submedian areas reticulate; sublateral  
areas with longitudinal rugae.

Gaster smooth and shining.

Subcosta, median and anal veins with erect or suberect long hairs; radial  
vein 1.12 x as long as pterostigma.

Male. HL 0.53 mm; HW 0.55 mm; WF 0.33 mm; LA 0.98 mm; LP 0.33 mm; WPD 0.39  
mm; FWL 1.6 mm; TL 2.0 mm.

Body black; gaster somewhat brownish; mandibles, antennae, and legs yellow  
to yellowish brown.

Head as in Fig. 348, surface microreticulate. Eyes 0.25 mm in length.  
POL:AOL = 4:3; OOL 0.74 x WOT.

Pronotal disc trapezoidal; maximum width 2.0 x minimum width; length 2.8 x  
maximum width. Propodeum wider than long, with a median carina, coarsely  
microreticulate.

Wings as in female. Subgenital plate shown in Fig. 352; genitalia as in  
Fig. 353.

Holotype. Female, Sakuragaoka, Setagaya-ku, Toko, 25.VII.1972, S.  
Tachikawa leg. [NIAES].



Paratypes. 1f, same locality as holotype, 30.X.1969, Y. Yoshikawa leg. [TE]; 1f, same locality, 22.XI.1972, Y. Yoshikawa leg. [TE]; 1f, same locality, 18.X.1972, K. Mochizuki leg. [TE]; 1f, same locality, 16.XII.1970, T. Sato leg. [TE]; 1f, 1.X.1971, S. Tachikawa leg. [TE]; 1f, same locality, 22.X.1969, T. Saito leg. [TE]; 1f, same locality, 17.IX.1971, Y. Yoshikawa leg. [TE]; 1f, same locality, 1971, Y. Yoshikawa leg. [TE]; 1f, same locality, 30.VIII.1970, K. Dobashi leg. [TE]; 1f, Kanaya, Shizuoka Pref., 19.VIII.1954, J. Minamikawa leg. [NIAES]; 1f, same locality, 10.VIII.1953, J. Minamikawa leg. [NIAES]; 1f, same locality, 11.VIII.1954, J. Minamikawa leg. [NIAES]; 1f, Kodaira-shi, Tokyo, 19.VII.1963, J. Minamikawa leg. [NIAES]; 1f, same locality, 18.X.1967, J. Minamikawa leg. [NIAES]; 1f, Kami-youga, Setagaya-ku, Tokyo, 17.XI.1972, Y. Yoshikawa leg. [TE]; 1f, Youga, setagaya-ku, Tokyo, 9.IX.1971, S. Katsuya leg. [TE]; 1f, Iwatsuk-shi, Saitama Pref., 27.IX.1966, Y. Yoshikawa leg. [TE]; 1f, same locality, 9.IX.1966, Y. Yoshikawa leg. [TE]; 1f, same locality, 11.IX.1972, Y. Yoshikawa leg. [TE]; 1f, Nishigahra, Tokyo, 18.IX.1958, N. Fukushima leg. [NIAES]; 1f, 1m, Yokohama, Kanagawa Pref., 19.IX.1935, K. Sato leg. [NASM]; 1f, same locality, 28.VIII.1941, K. Sato leg. [NASM]; 1f, same locality, 8.IX.1955, K. Sato leg. [NASM]; 1f, Harumi-cho, Tokyo, 20.X.1961, K. Sato leg. [NASM]; 2f, Ogose, Saitama Pref., 16.VII.1979, T. Nambu leg. [CNC, TE]; 1f, same locality, 19.XI.1979, T. Namubu leg. [MNHA]; 1f, same locality, 8.IX.1977, T. Nambu leg. [MNHA]; 1f, same locality, 4.VII.1979, T. Namubu leg. [TE]; 1f, same locality, 5.XI.1979, T. Nambu leg. [TE]; 2f, Yorii, Saitama Pref., X.1976, T. Namubu leg. [TE]; 1f, same

locality, VIII.1973, T. Nambu leg. [TE]; 1f, same locality, 8.IX.1969, T. Nambu leg. [TE]; 1f, same locality, 15.VII.1973, T. Namubu leg. [TE]; 1f, same locality, 10.X.1989, T. Nambu leg. [TE]; 1f, Ohkagou, Hachijo-jima I., Tokyo, 21.X.1988, H. Takahashi leg. [TE]; 1f, Kawasaki-shi, Kanagawa Pref., 20.VII.1979, M. Terayama leg. [TE]; 1f, Kiyosumi, Utsunomiya-shi, Tochigi Pref., 12.VIII.1981, K. Nakamura leg. [TE]; 1f, Yagoto, Aichi Pref., 30.VI.1972, H. Yamada leg. [TE]; 1f, same locality, 5.X.1971, H. Yamada leg. [TE]; 1f, Fukuoka-shi, Fukuoka Pref., 27.VIII.1958, R. Morimoto leg. [KUF]; 2f, same locality, 1944, K. Yasumatsu leg. [KUF]; 1f, Ropponmatsu, Fukuoka-shi, Fukuoka Pref., XI.1958, S. M. leg. [KUF].

Distribution. Honshu, Shikoku, Kyushu.

Host. *Anthrenus verbasci* (Coleoptera, Dermestidae) (Iwata, 1941, Yamada, 1942).

Remarks. Since Iwata (1941) Japanese students have erroneously identified this common Japanese species as *microneurus*. It is distinguished from *microneurus* as follows: 1) transverse carina concave (straight in *microneurus*), 2) inner sublateral carinae relatively weak (strong in *microneurus*) 3) posterior 1/4 of outer sublateral carinae curved inwards (almost straight in *microneurus*), 4) antennal scapes yellowish brown (blackish brown in *microneurus*), 5) trochanters blackish brown and tibiae testaceous (trochanters and tibiae yellowish brown in *microneurus*). The holotype of *microneurus* deposited in the collection of Museum d'Histoire Naturelle, Paris, is illustrated in Figs. 354-356. No specimen of the *microneurus* was found



among the Japanese material which I examined, and all of the records of microneurus from Japan are doubtful. *L. microneurus* is therefore excluded from the Japanese fauna until a reliable record is available.

Biology. Ecological study was made by Iwata (1941), Yamada (1942, 1955), Fujimaru (1991) and others.

This species has two generations a year. First generation adults emerge at the end of July and the second generation adults at the beginning of August. The females catch the larvae of *Anthrenus verbaci* (Coleoptera, Dermestidae), sting them into paralysis of abdomen. The females lay 1 to 4 eggs on a host. The hibernation is carried out by the larva which is enclosed in a cocoon.

*Laelius yokohamensis* sp. nov.

(Figs. 357, 361, 363)

Japanese name: Oh-arage-arigatabachi

Holotype. Female. HL 0.68 mm; HW 0.75 mm; FW 0.44 mm; LA 1.30 mm; LPD 0.40 mm; WPD 0.60 mm; FWL 1.95 mm; TL 3.5 mm.

Head, alitrunk and gaster black; mandibles reddish yellow; antennal scapes, 2nd segment, and anterior half of 3rd segment reddish yellow; legs reddish yellow. Fore wings with basal 1/3 hyaline, and apical 2/3 slightly brownish; veins and stigma pale yellowish brown.

Head 0.91 x as long as wide, relatively weakly microreticulate and

subopaque; the longest hair on occiput 0.10 mm. Mandibles with dentition, but the number of teeth not countable due to the condition of specimen. First 5 segments of antennae in a ratio of about 9:4:4:3:3 in length; 2nd and 3rd segments each 1.3 x as long as wide; 4th and 5th segments each as long as wide. Eyes 0.35 mm in maximum diameter; FW 1.26 x EL. POL:AOL = 9:6; OOL 0.78 x WOT.

Pronotal disc with concave sides and almost straight anterior border; maximum width 1.5 x minimum width; surface more strongly microreticulate than on head. Mesonotum microreticulate. Propodeal disc 0.67 x as long as wide, with parallel lateral borders and weakly concave occipital border; 7 discal carinae present; length of the anteriormost 0.6 x length of the disc; 1st submedian carinae connected to median carina near posterior end; sublateral carinae distinct; sublateral areas microreticulate with transverse rugae.

Gaster smooth and shining. Basal, median, and anal veins with long erect or suberect hairs; length of radial veins 2.3 x length of pterostigma.

Holotype. Female. Okazawa-cho, Yokohama, Kanagawa Pref., 1.VIII.1983, M. Kawai leg. NIAESJ.

Distribution. Honshu.

Remarks. Known only from the type.



Tribe Sclerodermini

Japanese name: Hosō-arigatabachi-zoku. [Yamada-arigatabachi-aka (as a sub-family Scleroderminae), Iwata in Yamada, 1942]

This tribe is separated by the other tribes as follows: 1) antennae with 13 segments; 2) clypeus short, truncate apically; 3) eyes situated forward on head; 4) PF = 6-5, 3-2.

Genus *Allobetylus* Kieffer

*Allobetylus* Kieffer, 1905. Proctotrypides. Species des Hymenopteres

d'Europe & d'Algerie, 9: 247.

Nesepyrus Bridwell, 1920. Proc. Hawaiian Ent. Soc., 4: 309. [Synonymized

by Terayama, part I of the present paper.]

Japanese name: Kibanaga-arigatabachi-zoku.

Diagnosis. Five species have been known from the Nearctic region and Hawaiian Islands. These are small wasps with the following combination of characteristics.

1. Head rectangular and elongate, more than 1.3 x as long as wide.
2. PF = 6, 2.
3. Mandibles elongate and sickle-shaped, terminating in 2 or 3 teeth.
4. Median lobe of clypeus truncated anteriorly.
5. Antennae with 13 segments.

6. Pronotum elongate.

7. Notauli and parapsidal furrows present.

8. Scutellum with a pair of basal pits which are connected by a groove or a very shallow impression.

9. Pterostigma very short.

10. Radial vein long.

*Allobetylus tomoae* sp. nov.

(Figs. 365-367)

Japanese name: Kibanaga-arigatabachi.

Holotype. Female. HL 0.73 mm; HW 0.51 mm; FW 0.23 mm; LA 1.10 mm; LPD 0.35 mm; WPD 0.35 mm; TL 3.0 mm.

Body black; coxae, trochanters, femora and posterior half of fore tibiae blackish brown; mandibles, antennae, tibiae except for posterior half of fore tibiae and tarsi brown.

Head rectangular, 1.43 x as long as wide, with almost parallel sides and concave posterior border in frontal view; surface microreticulate. Mandibles sickle-shaped; tip with 3 teeth. Anterior border of clypeus with 3 small blunt teeth at midlength. Antennae short; first 5 segments in a ratio of about 10:3:1.5:1.5:1.7 in length; scape 3.3 x as long as wide; 2nd segment 2.0 x as long as wide; 3rd segment as long as wide; apical segment 1.5 x as long as



wide, 1.5 x as long as previous segment. Eyes flat, with short erect hairs, 0.25 mm in maximum diameter; FW 0.92 x EL. Ocellus small, front angle of ocellar triangle acute; POL:AOL = 5:7; OOL 2.75 x WOT.

Pronotal disc 0.79 x as long as wide; surface microreticulate. Mesonotum microreticulate, notauli shallow. Propodeal disc as long as wide, with parallel sides and weakly concave posterior border; anterior triangle strongly microreticulate, elsewhere moderately microreticulate; median carina reaching midlength of the disc; lateral and transverse carinae distinct.

Gaster smooth and shining.

Holotype. Female, Tadami-cho, Minami-aizu-gun, Fukushima Pref., 10.VI.1959, M. Kanno leg. [NIAES].

Paratypes. 2f, Shimoda, Izu, Shizuoka Pref., 30.VI.1985, T. Satoh leg. [NASM, TE], 1f, Okinawa-jima I., Okinawa Pref., 13.V.1989 (emerged from a dead wood of *Cinnamomum* sp.), H. Makihara leg. [NIAES]; 1f, Kamakura, Kanagawa Pref., H. Nagase leg. [TE].

Distribution. Honshu, Okinawa Is.

Remarks. This is the first record of the genus from Asia.

Genus *Sclerodermus* Latreille

*Sclerodermus* Latreille, 1809. *Genera Crust. et Insect.*, 4: 118.

*Scleroderma* Oken, 1817. 1817. *Isis von Oken*, 1: 1178. [Unjustified emendation.]

*Sclerochroa* Foerster, 1850. *Verh. Naturhist. Ver. Rheinlande*, 7: 501. [New name for *Scleroderma*, preoccupied in plants. Unnecessary replace name.]

*Neoscleroderma* Kieffer, 1905. *Ann. Soc. Sci. Bruxelles*, 29: 106. [Synonymized by Evans, 1964.]

Japanese name: Hosō-arigatabachi-zoku.

Diagnosis. Small wasps with the following combination of characteristics.

1. PF = 5.3.
2. Anterior border of clypeus truncate.
3. Antennae with 13 segments.
4. Ocelli absent in apterous forms and developed in alate one.
5. Occipit without collar.
6. Propodeal disc without lateral and transverse carinae.
7. Costa absent.
8. Subcosta, median, and basal veins present.
9. Anal and transverse median veins present or absent.

Winged, short winged, or apterous forms in either sex are present.



Key to the Japanese Species of Sclerodermus

1. Anterolateral borders of 1st gastral segment forming an angle in dorsal view; anterior border of the segments concave .....  
.....S. yakushimensis sp. nov. [Yaku]
- Anterolateral borders of 1st gastral segment rounded, not forming an angle in dorsal view; anterior border of the segment convex .....  
.....S. harmandi (Buysson) [Hok, Hon, Shi, Kyu, Ryu, Ogasawara]

*Sclerodermus harmandi* (Buysson) comb. nov.

(Figs. 369-382)

*Dissomphalus harmandi* Buysson, 1902. Bull. Mus. d'Hist. Nat. Paris, 9: 126.

*Dissomphalus(?) harmandi*: Kieffer, 1908. Genera Insectorum, 76: 36.

*Sclerodermus nipponense* Yuasa, 1930. Jour. Imp. Agr. Exp. St., 1: 224. Syn. nov.

*Scleroderma nipponense*: Evans, 1963. Bull. Mus. Comp. Zool., 129: 177

; Terayama, 1990. Bull. Toho Gakuen, (5): 21.

*Scleroderma guani* Xiao & Wu, 1983. Scientica Silv. Sinicae, 8: 81.

Provisional Syn.

Japanese name: Hoso-arigatabachi. [Kuro-arigatabachi, Yuasa, 1930; Chibi-arigatabachi, Yoshikawa, 1984.]

Redescription of holotype. Apterous female. HL 0.55 mm; HW 0.50 mm; WF 0.30 mm; LA 1.00 mm; LP 0.43 mm; WPD 0.35 mm; TL 4.0 mm.

Head, alitrunk, 1st gastral segment, and legs castaneous; gaster except for the 1st segment dark brown; antennae yellowish.

Head as in Fig. 370. 1.1 x as long as wide, with subparallel sides and concave posterior border. Mandibles with 4 teeth; basalmost and basal second tooth minute. Clypeus emarginate apically. First 5 antennal segments in a ratio of about 8:2:1:1:1 in length; scape clavate, 3.2 x as long as maximum width; 2nd segment slightly longer than wide; 3rd to 12th segments each broader than long; apical segment 2.0 x as long as wide. Eyes 0.16 mm in maximum diameter; WF 1.88 x EL; WH 3.13 x EL. Ocelli absent.

General shape of alitrunk shown in Figs. 371 and 372. Pronotal disc as long as wide; mesonotum 1.2 x as long as wide; in dorsal view, propodeum broadest at near posterior end; maximum width 1.56 x minimum width; posterodorsal corners bluntly angulated.

Body surface weakly microreticulate; reticulation on head less than that on alitrunk.

Alate female. HL 0.48 mm; HW 0.45 mm; WF 0.25 mm; LA 0.88 mm; LP 0.30 mm; WPD 0.32 mm; FWL 1.6 mm; TL 5.0 mm. (One individual was measured.)

Head, pronotum and propodeum castaneous; meso- and metanotum and gaster dark brown; antennae and legs yellowish.

General form of head as in apterous female. Eyes 0.18 mm in maximum diameter. Ocelli small; front angle of ocellae triangle acute; OOL 2.7 x WOT;



POL:AOL = 3:4; DAO ca. 0.02 mm.

Pronotal disc subtriangular, with rounded anterior border in dorsal view; 2.0 x as long as maximum width. Mesoscutum 1.9 x as long as wide. Propodeum rectangular, widest at posterior 1/5 in dorsal view; 1.1 x as long as maximum; posterolateral corners dully angulated.

Forewings as in male; anal vein indistinct; small pterostigma present at basal 1/3.

Male. HL 0.42-0.43 mm; HW 0.40-0.41 mm; WF 0.25 mm; 0.85-0.87 mm; WP 0.30-0.32 mm; WPD 0.41-0.43mm; FWL 1.4-1.5 mm; TL 1.8-2.0 mm (4 individuals were measured.)

Body blackish brown; antennae and legs brown.

Head slightly longer than wide, with convex posterior border in frontal view; posterolateral corners not forming an angle; surface weakly microreticulate. Mandibles with 2 teeth; apical large and acute. First 4 antennal segments in a ratio of 6:3:1:1 in length; 2nd segment 1.5 x as long as wide. Eyes 0.17-0.18 mm in length. Ocelli small, forming a acute triangle.

Pro- and mesonotal dorsum weakly microreticulate. Propodeum wider than long, smooth and shining in most part.

Forewings as in Fig. 380; anal vein obscure.

Variation. The apterous female varies in head length from 0.45 to 0.60 mm, and in head width from 0.40 to 0.62 mm; head and alitrunk vary from yellowish brown to blackish brown. Dorsolateral corners of propodeum of the Chinese individuals are more strongly angulated than that of the Japanese

ones.

The male varies in color from blackish brown to almost black.

Material examined. Japan. Nippon Moyen env. de Tokio at Alpes de Nikko, J. Harmand leg., 1901. (holotype, apterous female) [MNHN]; 1f, Sapporo, Hokkaido, 10.VII.1958, C. Watanabe leg.; 1f, Iwate Pref., Ogasawara leg.; 1f, Itabashi-ku, Tokyo, 25.IV.1985, T. Niisato leg.; 1f, Komae-shi, Tokyo, 25.IV.1984, M. Terayama leg.; 7f, Shikine-jima I., Izu Is, Tokyo, 28.III.1988, M. Terayama leg.; 13f, Tsukuba-shi, Ibaraki Pref., T. Satoh leg.; 12f, Hannou-shi, Saitama Pref., 29.IV.1972, H. Kobayashi leg.; 1f, Iitomi, Yamanashi Pref., 2.V.1971, K. Dobashi leg.; 2f, Yoriii-machi, Saitama Pref., 1.V.1965, T. Nambu leg.; 1f, same locality, 17.IV.1965, T. Nambu leg.; 1f, same locality, 1.VI.1981, T. Nambu leg.; 2f, Ichikawa-shi, Chiba Pref., V.1970.; 1f, Shibuya, Tokyo, 15.VI.1942, K. Sato leg.; 1f, Haramachi, Ohta-ku, Tokyo, 26.VII.1953, S. Katsuya leg.; 1f, same locality, 25.V.1952, S. Katsuya leg.; 1f, same locality, 27.IV.1953, S. Katsuya leg.; 5f, Tateyama, Chiba Pref., 28.XII.1979, M. Terayama leg.; 3f, Yoriii, Saitama Pref., 4.VIII.1982, T. Nambu leg.; 1f, Kanayama-machi, Minamiaizu-gun, Fukushima Pref., 19.VII.1968, Miyano leg.; 2f, Adachi-machi, Adachi-gun, Fukushima Pref., VII.1973, Miyano leg.; 1f, 1m, same locality, VIII.1977, Miyano leg.; 1f, Yokohama, Kanagawa Pref., 8.V.1952, S. Katsuya leg.; 2f, Shin-yamashita, Yokohama, Kanagawa Pref., 24.VII.1952, S. Kanagawa leg.; 3f, (Yokohama Bay), Yokohama, VI.1972, K. Iwata leg.; 2f, Hannou-shi, Saitama Pref., 12.V.1972, H. Kobayashi leg.; 1f, Tokorozawa-shi, Saitama Pref., IV.1971, T. Kuroda leg.; 20f, Tateyama, Chiba Pref.,



28.XII.1979, M. Terayama leg.; 1f, Iwatsuki-shi, Saitama Pref., 23.V.1965, Y. Yoshikawa leg.; 1f, same locality, 22.V.1965, Y. Yoshikawa leg.; 1f, Asagaya, Tokyo, 32.IV.1955, Y. Asano leg.; 1f, Nippara, Okutama, Tokyo, 28.VIII.1961, S. Katsuya leg.; 1f, Kirizumi, Gunma Pref., 13.VIII.1962, N. Gokan leg.; 1f, Mikura-jima I., Tokyo, 17.V.1967, Y. Kurosawa leg.; 1f, Aogasima I., Izu Is., Tokyo, 5.VIII.1989, M. Terayama leg.; 2f, Toga-jima I., Owase-shi, Mie Pref., 13-V-1988; 1f, Tokyo, 16.VIII.1962, J. Minamikawa leg.; 1f, Tokyo, 1.IX.1962, J. Minamikawa leg.; 1f, Kanaya, Shizuoka Pref., 10.V.1954, J. Minamikawa leg.; 1f, same locality, 10.VIII.1953, J. Minamikawa leg.; 1f, same locality, 10.X.1956, J. Minamikawa leg.; 1f, same locality, 12.VII.1953, J. Minamikawa leg.; 1f, same locality, 11.IX.1953, J. Minamikawa leg.; 1f, Hatsudai, Tokyo, 19.VI.1973, T. Okazaki leg.; 1f, Nishiogikubo, Tokyo, 13.VII.1939, M. Kawai leg.; 1f, the same locality, 1.V.1938, M. Kawai leg.; 2f, same locality, 1937, M. Kawai leg.; 1f, Kodaira-shi, Tokyo, 20.IX.1965, J. Minamikawa leg.; 1f, Kodaira-shi, Tokyo, 10.VIII.1963, J. Minamikawa leg.; 1f, Kirizumi, Gunma Pref., 27.VII.1967, M. et H. Hasegawa leg.; 1f, 1 alate female, Yakushima I., Kagoshima Pref., 21-31.VIII.1987, H. Makihara leg.; 1m, Okinawa-jima I., Okinawa Pref., 13.V.1989, H. Makihara leg.; 2f, Ishigaki-jima I., Okinawa Pref., 8.II.1975, H. Makihara leg.; 1f, Mt. Banna, Ishigaki-jima I., 29.VIII.1978, T. Nambu leg.; 1f, Ogasawara Is., Tokyo, 14-VI-1972, S. Okajima leg.; 2f, Chichi-jima I., Ogasawara Is., Tokyo, 31.III.1970, K. Kojima leg.; 1f, Haha-jima I., Ogasawara Is., Tokyo, 12.X.1990, E. Hasegawa leg.; 1f, Miyanoura, Yakushima I., Kagoshima Pref., 5-6.IV.1971, K. Yamagishi leg.; 1f,

same locality, Kagoshima Pref., 8.VIII.1975, K. Yamagishi leg.; 1f, Shimonoseki, Yamaguchi Pref., 26.IV.1967; 1f, Kamakura, Kanagawa Pref., 20.V.1953, H. Nagase leg.; 1f, same locality, 13.VII.1953, H. Nagase leg.; 5f, Toyohashi, Kanagawa Pref., V.1962, T. Tsunekawa leg.; 13f, Tukuba-shi, Ibaraki Pref., 1990, T. Satoh leg.; 11f, Higashi-hanawada, Utsunomiya-shi, Tochigi Pref., 8.IX.1992, T. Imura leg.

Korea. 2f, Suwon, Kyonggi-do, 25.VIII.1990, M. Terayama leg.

Taiwan. 1f, Nanshan-chi, Nantou Hsien, Taiwan, 5.VIII.1981, M. Terayama leg.

China. 60f, Zo-Se, near Shang-hai; 20f, 36m, Beijing, 20.XII.1983; 24f, Guangdong Prov., III.1991; 14f, 3m, Beijing, 1.VII.1992.

Remarks. This species is originally described as a genus *Dissomphalus* by Buysson (1902). I have examined the type species and concluded that it is a member of the genus *Sclerodermus* and conspecific in *Sclerodermus nipponicus* Yuasa, 1930. Therefore, the latter species is a junior synonym of *Sclerodermus harmandi*.

In China, *Sclerodermus guani* described by Xiao & Wu (1983) have been used enthusiastically for the control of red pine tree pest, mostly for cerambicid larvae. Unfortunately, the types of *S. guani* had not been deposited in the collection of the Forest Research Institute, Beijing, and uncertain where it is. However, all the individuals, which are regarded as *S. guani* and have been used for the pest control in China, were *S. harmandi*. I provisionally regarded as *S. guani* to junior synonym of *S. harmandi*. This species may be widely dis-



tributed in the East Asia.

The female has both fully winged and apterous forms and the male has only fully winged form.

Host. The host records are presented in Table 26.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Ryukyus, Ogasawara Is.), Korea (new record), Taiwan, China.

Biology. This species is parasitic of coleopteran wood borers, and this would be effective against for the control of cerambycids (Zhang et al., 1989; Enda, 1993). On the other hand, many cases to injuries to human in houses have been reported (Yuasa & Ogami, 1930; Yuasa, 1932; Asahina, 1953; Ariga, 1959; Ito & Shimogama, 1962; Kawashima, 1959; Higuma, 1966; Oda et al., 1981, etc.).

The females lay about 70 eggs (range 58-83) during the survival period in Wakayama Pref. The longevity of the females is about 40 days (range 19-70)(Ido, 1967). This species may has 4-5 generation a year in Japan. The hibernation is carried out by adult stage.

The females display some form of parental cares, especially protection, toward her eggs through larvae to cocoons (Tachikawa, 1985; Enda, 1992). She also produce parthenogenetically females.

Table 24. Host records of *Sclerodermus harmandi*.

| Host species                            | Source                              |
|---|-------------------------------------|
| <i>Anobiidae</i>                        |                                     |
| <i>Ptilieurus marmoratus</i>            | Yuasa, 1930                         |
| <i>Ernobius mollis</i>                  | Uemura, 1935; Asahina, 1953         |
| <i>Nicobium castaneum</i>               | Hori, 1980                          |
| <i>Bostrychidae</i>                     |                                     |
| <i>Dinoderus minutus</i>                | Hamada, 1963                        |
| <i>Scolytidae</i>                       |                                     |
| <i>Phloeosinus perlatus</i>             | Zhang et al., 1989                  |
| <i>Cerambycidae</i>                     |                                     |
| <i>Anaglyptus subfasciatus</i>          | Okada & Ido, 1966                   |
| <i>Chlorophorus annulatus</i>           | Okada & Ido, 1966                   |
| <i>Palaeocallidium rufipenne</i>        | Okada & Ido, 1966                   |
| <i>Ovalisia vivata</i>                  | Okada & Ido, 1966                   |
| <i>Monochamus alternatus</i>            | Nobuchi, 1980; Zhang et al., 1991   |
| <i>Semanotus bifasciatus sinoauster</i> | Xiao & Wu, 1983; Zhang et al., 1989 |
| <i>Saperda populnea</i>                 | Xiao & Wu, 1983                     |
| <i>S. balsamifera</i>                   | Zhang et al., 1989                  |
| <i>Anoplophora chinensis</i>            | Zhang et al., 1983                  |



|                                  |                    |
|----------------------------------|--------------------|
| <i>A. macularia</i>              | Lee & Chang, 1965  |
| <i>Apomeoyna maculaticallis</i>  | Lee & Chang, 1965  |
| <i>A. excavaticeps</i>           | Lee & Chang, 1965  |
| <i>Aromia bungii</i>             | Zhang et al., 1983 |
| <i>Chreonoma fortunei</i>        | Li, 1987           |
| <i>Stromarium longicorne</i>     | Lee & Chang, 1965  |
| <i>Palaeocallidium rufipenne</i> | Okada & Ido, 1966  |

*Sclerodermus yakushimensis* sp. nov.

(Figs. 383-388)

Japanese name: Yakushima-hoso-arigatabachi.

Holotype. Alate female. HL 0.85 mm; HW 0.80 mm; LA 1.63 mm; LPD 0.55 mm; WPD 0.60 mm; FWL 3.1 mm; TL 4.8 mm.

Body black; mandibles and antennae yeellowish brown; trochanters and femore castaneous; tibiae and tarsi yellowish brown.

Head slightly longer than wide, with gently convex sides and almost straight posterior border in frontal view; surface smooth and even shining with very weakly microreticulate. Mandibles with 4 teeth; apical tooth most developed; basalmost smallest. Clypeus emerginate, with a strong median carina. First 5 segments of antennae in a ratio of about 14:3.5:2:2:2 in length; scape 3.4 x as long as maximum width; 2nd segment 1.8 x as long as wide; 3rd as long as wide; 4th to 12th segments each slightly wider than long; apical segment 1.5 x as long as wide. Compound eyes 0.28 mm in maximum diameter. Ocelli small, forming an obtuse triangle; OOL 3.5 x WOT.

Alitrunk smooth and shining, but weakly microreticulate. Pronotal disc 1.45 x as long as wide; mesonotum 0.71 x as long as wide. Propodeum broadest at posterior end; maximum width 1.1 x minimum width; posterolateral corners forming an angle; disc 0.92 x as long as wide.

Gaster smooth and shining, but weakly microreticulate; 1st gastral segment



with concave anterior border in dorsal view; anterolateral borders forming an angle.

Paratype apterous female. HL 0.60 mm; HW 0.53 mm; WF 0.48 mm; LA 1.40 mm; LPD 0.50 mm; WPD 0.55 mm; TL 5.2 mm.

General shape as in alate female, but ocelli and tegulae absent.

Holotype. Alate female. Onoma, Yakushima I., Kagoshima Pref., 7.III.1991, T. Satoh leg. [NIAES].

Paratypes. 2 alate females, 1 apterous female, same data as holotype [NIAES, BMNH, NASM].

Distribution. Yakushima. I.

#### Tribe Cephalonomiini

Japanese name: Kona-arigatabachi-zoku.

This tribe is distinguished from the other tribes by the 12-segmented antennae, truncate median lobe of clypeus, and PF= 5-3, 2-1. These are minute and rarely exceeding 2.5 mm in total body length. Wings are reduced or absent in some species.

#### Genus *Plastanoxus* Kieffer

*Plastanoxus* Kieffer, 1905. in Andre, Spec. Hymen. Eur. Alger., 9: 244.

*Snappania* Hedqvist, 1975. Ent. Tidskr., 96: 130. [Synonymized by Evans, 1978.]

Japanese name: Keshi-arigatabachi-zoku.

Diagnosis. Very small wasps with the following combination of characteristics.

1. PF = 5-3, 2-1.
2. Clypeus with median lobe short, bluntly rounded or truncate.
3. Antennae with 12 segments.
4. Mesoscutum without notauli.
5. Radial vein long.
6. Prostigma present.
7. Anal vein absent or very faintly indicated.



8. Costa absent.

Key to the Japanese species of *Plastanoxus*

(Female)

1. Pronotal disc smooth and shining in most parts; head less than 1.30 x as long as wide.....*P. amamiensis* Terayama & Tachikawa [Hon. Amami]  
- Pronotal disc strongly microreticulate; head much slender, more than 1.35 x as long as wide..... *P. fukuokensis* sp. nov. [Kyu]

*Plastanoxus amamiensis* Terayama & Tachikawa, 1987

(Figs. 394-402)

*Plastanoxus* sp.: Tachikawa & Oda, 1977. *Trans. Shikoku Ent. Soc.*, 13: 129.

*Plastanoxus amamiensis* Terayama & Tachikawa, 1987. *Trans. Shikoku Ent. Soc.*,

18: 311.

Japanese name: Tsutsukinoko-arigatabachi. [Tsutsukinoko-arigatabachi, Tachikawa, 1980.]

Redescription of holotype. Female. HL 0.38 mm; HW 0.30 mm; WF 0.20 mm; LA 0.57 mm; LPD 0.23 mm; WPD 0.22 mm; FWL 1.0 mm; TL 1.5 mm.

Body black; mandibles, antennae and legs brown; 1st and anterior half of 2nd gastral tergites brownish; wings hyaline; veins, pterostigma and prostigma brownish.

Head rectangular, with convex sides and weakly convex posterior border, shining and only weakly microreticulate; WH 0.8 x LH. Mandibles slender, with a shape apical tooth and 2 small blunt teeth. Clypeus broadly truncate apically. First 5 segments of antennae in a ratio of about 35:15:5:5:7 in length; 3rd segment wider than long. Eyes with short erect hairs sparsely; WF 1.14 x HE; distance from eye tops to vertex crest subequal to HE. Ocelli small in a right triangle; OOL 1.5 x WOT.

Pro- and mesonotal dorsum smooth and shining. Propodeal disc 0.67 x as long as its anterior width; median carina delicate but nearly complete to the transverse carina; central, basal and posterolateral areas with fine reticulations; elsewhere smooth and shining; propodeal declivity strongly reticulate.

Gaster smooth and shining. Forewings without closed cells; radial vein nearly straight, extending about 0.37 x distance from pterostigma to wing tip.

Redescription of a paratype male. HL 0.33 mm; HW 0.35 mm; WF 0.23 mm; LA 0.57 mm; LPD 0.22 mm; WPD 0.22 mm; FWL 1.0 mm; TL 1.3 mm.

Body black; mandibles, antennae dark brown; legs dark brown except tibiae light brown; 1st and anterior half of 2nd gastral tergites brownish; wings hyaline; veins, stigma and prostigma brownish.

Head rounded, without posterolateral angles; WH 1.08 x LH; shining and very weakly microreticulate. Mandibles and clypeus as in female. Eyes with short hairs sparsely; WF 1.5 x HE. Front angle of ocellar triangle more than a right angle; median ocellus far behind the eyes; OOL about as long as WOT.



First 5 segments of antennae in a ratio of 23:17:7:8:8 in length; 3rd segment as long as wide.

Pronotum shining and very weakly microreticulate; mesonotum and scutellum smooth and shining. Propodeum as in female. Wing venation also in that sex.

Gaster smooth and shining. Subgenital plate half circular, with long median stalk. Parameres of genitalia divided into a broad ventral and a more slender dorsal arms as in Fig. 400.

Variation. The head shape of the individuals from Kyoto has slightly more slender than that of Amami-ohshima I.

Material examined. Shin-mura, Amami-oshima I., Kagoshima Pref., 6. IV. 1977, A. Oda leg. (holotype, female) [EUM]; 4f, 7m, same data as holotype (paratypes) [EUM, NIAES, OMNH]; 22f, 18m, Ashiu, Kyoto Pref., 26. V. 1990, S. Satuda leg.

Host. *Octotemnus laminifrons* Motschulsky (Coleoptera: Ciidae) (Tachikawa & Oda, 1977).

Distribution. Honshu, Amami Is.

*Plastanoxus fukuokensis* sp. nov.

(Figs. 391-393)

Japanese name: Keshi-arigatabachi.

Holotype. Female. HL 0.38 mm; HW 0.28 mm; WF 0.18 mm; LA 0.58 mm; LPD 0.23 mm; WPD 0.24 mm; FWL ca. 1.0 mm; TL ca. 1.5 mm.

Body blackish brown; mandibles, antennae and legs dark brown; wings hyaline; veins, pterostigma and prostigma brownish.

Head rectangular, with subparallel sides and weakly convex posterior border, weakly microreticulate and subopaque; WH 0.74 x LH. Mandibles slender. Clypeus broadly truncate apically. First 4 segments of antennae in a ratio of about 5:1.5:1:1 in length; 3rd segment slightly wider than long. Eyes with short hairs; WF 1.55 x HE. Ocelli small in a right triangle; OOL 1.7 x WOT.

Pronotum coarsely microreticulate; mesonotum smooth and shining. Propodeal disc slightly longer than wide; median carina delicate but nearly complete to the transverse carina; basal triangular area strongly microreticulate; sub-lateral areas smooth and shining.

Gaster smooth and shining. Forewings without closed cells; radial vein almost straight, extending about 0.37 x distance from pterostigma to wing tip.

Holotype. Female, Fukuoka-shi, Fukuoka Pref., 13. VII. 1956, T. Hidaka leg. [KUF].

Host. *Sitophilus oryzae* (according to the label attached to the pin).

Distribution. Kyushu.

Remarks. Known only from the type.



Genus *Cephalonomia* Westwood

*Cephalonomia* Westwood, 1833. Mag. Nat. Hist., 6: 420.

*Holopedina* Foerster, 1850. Verh. Naturhist. Ver. Rheinlande, 7: 502.

[Synonymized by Ashmead, 1893.]

*Cephaloderma* Hoffer, 1936. Festcher. Embrik Strand, 1: 459. [Synonymized by Evans, 1964.]

Japanese name: Kona-arigatabachi-zoku.

Diagnosis. Minute wasps and its wings fully developed, short, or absent in either sex. It is separated from the other genera with the following combination of the characteristics.

1. PF = 5-4, 2-1.
2. Clypeus short, median lobe absent or poorly developed.
3. Antennae with 12 segments.
4. Ocelli present (with few exceptions in wingless form).
5. Mesoscutum without notauli.
6. Parapsidal furrows present as thin lines in winged forms.
7. Radial vein absent.
8. Prostogma present.
9. Median vein often absent.
10. Basal vein absent.
11. Anal vein absent.

Key to the Japanese species of *Cephalonomia*

(Female)

1. Body yellow in color.....*C. gallicola* (Ashmead) [Hok, Hon, Shi, Kyu]
- Body black in color.....2
2. Propodeal disc longer than wide; basal triangular area absent .....
- ..... *C. tarsalis* (Ashmead) [Hon, Shi]
- Propodeal disc wider than long; basal triangular area present and with 3-4 pairs of weak longitudinal reugulae .....
- ..... *C. shirahamana* sp. nov. [Sakishima]

*Cephalonomia gallicola* (Ashmead)

(Figs. 404-408)

*Sclerochroa gallicola* Ashmead, 1887. Ent. Amer., 3: 75.

*Cephalonomia gallicola*; Ashmead, 1893. Bull. U.S. Nat. Mus., 45: 48.

*Cephalonomia gallicola*; Tachikawa, 1976. Trans. Shikoku Ent. Soc., 13: 64.

*Holopedina nubilipennis* Ashmead, 1887. Ent. Amer., 3: 97. [Synonymized by Emden, 1931.]

*Cephalonomia xambeui* Giard, 1898. Bull. Ent. Soc. France, 1898: 50. [See Evans, 1978.]

*Cephalonomia quadridentata* Duchaussoy, 1917. Bull. Soc. Hist. Nat. Afrique Nord, 9: 111. [See Evans, 1978.]



*Cephalonomia caesarorum* Van Emden, 1931. Zeitschr. Morph. Okol. Tiere, 23:

431. [Nomen nudum, Evans, 1978.]

*Cephalonomia strandi* Hoffer, 1936. Festschr. Embrik Strand, 1: 460. [Synonym-

ized by Evans, 1964.]

*Cephalonomia* sp.: Nawa, 1913. Insect World, 17: 313.

Japanese name: Shibamushi-arigatabachi. [Aka-arigata-tamagobachi, Nawa, 1913;

Shibamushi-arigatabachi, Tachikawa, 1976.]

Female. Apterous. HL 0.50 mm; HW 0.44 mm; WF 0.29 mm; LA 0.63 mm; LPD 0.24 mm; WPD 0.30 mm; TL 1.8-2.0 mm.

Body brown; legs yellowish brown.

General shape as in Fig. 404. Head rectangular, 1.1 x as long as wide, weakly microreticulate and subopaque. Mandibles with 3 teeth. Eyes 0.09 mm in length. Ocelli small, forming a acute triangle; POL:AOL = 1:3-3.5.

Alitrunk weakly microreticulate; pronotal disc slightly wider than long; Mesonotum short, 0.44 x as long as wide in dorsal view. Propodeal disc wider than long, 0.8 x as long as wide, widest at posterior end; posterolateral corners angulate.

Gaster weakly microreticulate.

Alate male. HL 0.38 mm; HW 0.35 mm; FW 0.25 mm; LA 0.68 mm; LPD 0.20 mm; WPD 0.26 mm; FWL 1.2 mm; TL 1.5 mm.

Body yellowish brown; legs and head paler; antennae brown except scape yellowish brown.

Head squariform and microreticulate. Mandibles with 3 teeth. First 5 segments of antennae in a ratio of 6:3:1:1:1 in length. Eyes 0.15 mm in length. Ocelli small, forming compact triangle.

Pro- and mesonotal disc weakly microreticulate. Propodeal disc squariform, wider than long; posterolateral borders angulate; median triangular area reticulate; sublateral areas smooth and shining.

Forewings as in Fig. 405; median and anal veins obscure.

Variation. Female varies in total length from 1.3 to 2.6 mm and shows slight variation in color.

Material examined. 1f, Wakaba-cho, Chofu-shi, Tokyo, 10.IX.1990, M. Terayama leg.; 4f, same locality, 14.VIII.1991, M.T. & E.S. leg.; 2f, same locality, 13.VI.1991, M.T. & E.S. leg.; 1f, 1m, Kobe, Hyogo Pref., 27.IX.1977; 3f, Fukuoka, C. Okuma leg.; 1f, 1 alate female, Fukuoka, 1944, K. Yasumatsu leg.; 1f, Fukuoka, 30.III.1942, T. Shirozu leg.; 1f, Fukuoka, 18.VIII.1950, Y. Hirashima leg.; 2f, 1m, Fukuoka, VI.1955, Y. Hirashima leg.; 1m, Aburayama, Fukuoka, 21.VI.1959, S. Miyamoto leg.

Remarks. This species is firstly recorded in 1976 by Tachikawa from Japan, and after that, a lot of injury by the wasp sting had been reported. Therefore it is thought to recently introduced to Japan (Kiritani & Morimoto, 1992; Shinohara, 1993). However, the record of *Cephalonomia* sp. by Nawa (1913) is the present species in his figure and there is a specimen collected in 1942 from Fukuoka City in the collection of Kyushu University.

Distribution. Japan [Hok, Hon, Shi, Kyu]; widely distributed in Europe, North



America and Asia.

Host. Coleopteran larvae as follows: *Lasioderma sericorne*, *Stegobium paniceum*, *Ptinus* sp., and *Araecerus fasciculatus*.

Ecology. The detail ecological study was made by Van Emden (1931) and Kearns (1934). In Japan, there are Sakai & Nishida (1978), Ito (1980, 1981), Okutani (1987), Momoi & Tanioka (1982), Yamasaki (1982), and others.

This species is well known as a household sanitary injurious pest and may repeat 4 to 5 generations a year in Japan. The females lay 4.4 eggs on a host at intervals of 2.1 days, and survived a period of 2 months in summer and 6 months in winter. Clausen (1940) reported that one female deposited 158 eggs upon 76 hosts during a period of 36 days. The females did not lay their eggs at the temperatures below 15 c and above 40 c. This species produces parthenogenetically females.

The females always apterous, but the males have both fully winged and apterous forms.

*Cephalonomia shirahamana* sp. nov

(Figs. 412-414)

Japanese name: Shirahama-arigatabachi.

Holotype. Female. 0.63 mm; HW 0.55 mm; LA 0.93 mm; LPD 0.25 mm; WPD 0.36 mm; FWL 1.5 mm; TL ca. 2.3 mm.

Body black; legs and antennae dark brown.

Head rectangular, 1.15 x as long as wide, with weakly convex posterior border in frontal view; surface smooth in most part. Mandibles with 3 teeth; apical tooth acute and most developed. Antennae short, not reaching the posterolateral corners of head; scape 3.0 x as long as wide; 2nd segment longer than wide; 3rd to 11th segments each wider than long; apical segment longer than wide. Eyes large, 0.23 mm in length. Ocelli forming a right-angle.

Pro- and mesonotal dorsum weakly microreticulate. Propodeal disc wider than long, with weakly concave posterior border; weak median carina present; basal triangular area microreticulate with 3-4 pairs of weak longitudinal rugulae as in Fig. 414; sublateral areas smooth and shining.

Gaster smooth and shining.

Holotype. Female. Shirahama, Iriomote-jima I., Okinawa Pref., 31.VIII-5.IX. 1969, H. Makihara leg. [NIAES].

Distribution. Yaeyama Is.

*Cephalonomia tarsalis* (Ashmead, 1893)

(Figs. 409-414)

*Ateleopterus tarsalis* Ashmead, 1893. Bull. U.S. Nat. Mus., 45: 45.

*Neoscreroderma tarsale*: Kieffer, 1908. Genera Insectorum, 76: 41.

*Cephalonomia tarsalis*: Gahan, 1930. Proc. U.S. Nat. Mus., 77: 11.



*Cephalonomia tarsalis*: Tachikawa, 1966. Kontyu, Tokyo, 34: 21.

*Cephalonomia carinata* Kieffer, 1907. Berlin. Ent. Zeitschr., 51: 295. [See Brown, 1978.]

*Cephalonomia meridionalis* Brethes, 1913. An. Mus. Nac. Hist. Nat. Buenos Aires, 24: 87. [Synonymized by De Santis, 1970.]

*Cephalonomia kiefferi* Fouts, 1920. Proc. Ent. Soc., Wash., 22: 71. [See Brown, 1978.]

Japanese name: Nokogiri-hirata-arigatabachi. [Nokogiri-hirata-arigatabachi; Tachikawa, 1966.]

Female. HL 0.40 mm; HW 0.40 mm; FW 0.25 mm; LA 0.75 mm; LPD 0.24 mm; WPD 0.25 mm; FWL 1.3 mm; TL 1.6 mm.

Body black; legs, mandibles and antennae dark brown; antennal scapes black.

Head as long as wide, with almost straight posterior border in frontal view; surface weakly microreticulate. Mandibles with an apical tooth alone. Antennae with 12 segments; scape 3.0 x as long as wide; 2nd segments 2.0 x as long as wide; 3rd to 11th segments each with almost as long as wide. Eyes 0.17-0.18 mm in length. Ocelli forming a regular triangle.

Pro- and mesonotum weakly microreticulate. Propodeal disc almost as long as wide and moderately microreticulate; median carina present, reaching the transverse carina.

Gaster smooth and shining.

Forewings with median vein present; posterior half of anal vein obscure.

Male. General shape as in female, but differs as follows: 1) antennae elongate, 3rd to 11th segments each distinctly longer than wide, 2) head rounded, posterodorsal corners not forming an angle, 3) posterior half of propodeal disc smooth and shining.

Material examined. 2f, Fukagawa, Koto-tu, Tokyo, 26.X.1972, Y. Yoshikawa leg.; 4f, 1m, Matsuyama, Ehime Pref., 3.XI.1960, T. Tachikawa leg.

Host. Coleopteran larvae as follows; *Oryzaephilus surinamensis*, *Sitophilus granarius*, *S. oryzae*, *S. zaemays*, and *Tribolium castaneum*.

Remarks. Two females from Fukagawa, Tokyo, were collected in a grain warehouse. This species is apparently cosmopolitan and associated with stored products. All of the hosts of the wasps are coleopteran larvae which are pests of stored products.

Distribution. Japan [Honshu, Shikoku]; widely distributed in the North America, Europe, Australia, Asia and Africa.



Subfamily Mesitiinae

Mesitiinae [sic.] Berland, 1928.

Type genus: *Mesitius* Spinola, 1851.

Mesitiinae; Kurian, 1954.

Japanese name: Toge-arigatabachi-aka.

This subfamily is consist of 21 genera, and distributes to the Ethiopian, Oriental, and Palaearctic regions. The largest generic diversity is seen in the Palaearctic region. Some species are short winged, or apterous. This subfamily is separated the other subfamilies by the presence of propodeal spines and large 2nd gastral tergite.

Two species are occurred in Japan.

Genus *Heterocoelia* Dahlbom

*Heterocoelia* Dahlbom, 1854. Hymenoptera Europaea Praecipue Borealia.

Frederici Nicolai, Berlin, 2: 9, 21.

Japanese name: Toge-arigatabachi-zoku.

Diagnosis. Medium sized wasps with the following combination of characteristics.

1. Pronotum with a distinct at least partly developed median longitudinal furrow.
2. Median carina of clypeus simple, not dilated anteriorly.
3. Head and pronotum strongly punctate.

4. Mesonotum without a distinct at least partly developed median longitudinal carina.

5. Subgenital plate with a single stalk.

*Heterocoelia inagiensis* sp. nov.

(Figs. 416-417)

Japanese name: Inagi-toge-arigatabachi.

Holotype. Female: HL 1.24 mm; HW 1.10 mm; WF 0.73 mm; LA 1.95 mm; DPL 0.48 mm; DPW 1.15 mm; TL 5.0 mm.

Head and gaster black; alitrunk red; mandibles and clypeus reddish brown; antennae dark brown except frist two segments rather reddish brown; legs red.

Head 1.36 x as long as wide, with convex posterior border, microreticulate with large punctures which are ca. 0.025 mm in average diameter; occiput with a distinct collar; WF 1.51 x HW. Mandibles with 4 acute teeth; apical tooth most developed. Clypeus with a developed median carina; anterior border triangular with a dull median angulation. Maxillary palpi 6 segmented; labial 3 segmented. First 5 antennal segments in a ratio of 22:9:8:6:6 in length; scape massive, 2.8 x as long as wide; 2nd segment 1.6 x as long as wide; 3rd 1.6 x as long as wide and 4th slightly wider than long; terminal segment 1.8 x as long as wide. Eyes convex, with long hairs which are ca. 0.08 mm long; maximum diameters 0.45 mm. Ocelli small; OOL 0.92 x WOT. POL: AOL= 9:7.

Pronotal disc 1.7 x as long as maximum width, with a longitudinal furrow at middle; anterolateral corners bluntly angulated in dorsal view; disc



microreticulate with large punctures. Mesoscutum 0.28 x as long as wide; notauli deep and weakly curved; parapsidal furrows present at posterior half; punctures smaller than those on head. Scutellar pits large, 0.05 mm in maximum length, connected with distinct impression. Propodeum wider than long, with almost parallel sides and straight posterior border; maximum width 2.20 x median length. Posterolateral spines of propodeum longer than wide, with the tip rounded.

Gaster shining with minute punctures; punctures on 1st gastral tergite fewer than those on 2nd.

Forewings short, 0.80 mm in length, not exceeding posterior margin of propodeum.

Holotype. Female, Higashi-naganuma, Inagi-shi, Tokyo, 5-6. VIII. 1988, M. N. & M. T. leg. [NIAES].

Paratypes. 1f, Ogose, Saitama Pref., 22. V. 1979, T. Nambu leg. [NIAES]; 1f, Nohara, Konan, Saitama Pref., 15. IX. 1993, T. Nambu leg. [TE].

Distribution. Honshu.

*Heterocoelia kamakurensis* sp. nov.

(Fig. 418)

Japanese name: Kamakura-toge-arigatabachi.

Holotype. Male. HL 1.25 mm; HW 1.20 mm; WF 0.78 mm; LA 2.45 mm; DPL 0.50 mm; DPW 1.20 mm; FWL 3.40 mm; TL 5.7 mm.

Ground color black; tibiae and tarsi brown; antennae blackish brown;

wings brown except basal half of forewings darker; veins brown.

Head almost as long as wide including eyes, with convex posterior border in frontal view; surface microreticulate with large punctures which are ca. 0.03 mm in average diameter. Clypeus with developed median carina; anterior border trapezoidal. First 5 antennal segments in a ratio of about 16:9:14:11:12 in length; scape 2.2 x as long as wide; 2nd segment 1.3 x as long as wide; 3rd to 13th segments each longer than wide, more than 2.0 x as long as wide. Eyes strongly convex, with long hairs which are 0.38 mm long. OOL 1.17 x WOT; POL: AOL = 16:9.

Pronotal disc 2.03 x as long as maximum width; maximum width 1.53 x minimum width; punctures larger than those on head.

Mesoscutum microreticulate with shallow punctures; notauli deep; parapsidal furrows present but shallow. Scutellum microreticulate with about 13 punctures. Propodeal disc 0.5 x as long as width, with parallel sides and straight posterior border in dorsal view. Propodeal spines as long as wide, with rounded tip.

Anterior half of 1st gastral tergite opaque and scattered with micropunctures; posterior half smooth and shining. 2nd gastral tergite moderately punctate.

Holotype. Male, Kamakura, Kanagawa Pref., 9. VII. 1953, H. Nagase leg. [NIAES].

Paratype. 1m, the same data as holotype [TE].

Distribution. Honshu.

Remarks. The combination of the sexes in this genus is usually difficult by comparing the dried specimens, unless there are a certain number of the sets



of the two sexes captured at the same place and time. The possibility is that this species is the male of *H. inagiensis*. However, I described here as a separate species and should be wait to the resolution of this male-female association in the future.

Subfamily Bethylinae

Bethylini Kieffer, 1914. [As a tribe.]

Type genus: *Bethylus* Latreile, 1802.

Bethylinae; Berland, 1928. [Reised to subfamily status.]

Japanese name: Arigatabachi-aka.

This subfamily is compact, comprises 6 genera and distributed in the all zoogeographical regions. These wasps are parasitic on lepidopteran larvae and it is distinguished tfrom he other subfamilies by the following combination of characteristics.

1. Eyes large, more than 0.5 x head width.
2. Frons with median carina or polished stream extending a short distance from clypeus.
3. Metanotum reduced, the scutellum in contact with the propodeum medially or nearly so.
4. Dorsolateral corners of propodeum simple, without spine.
5. Basal vein with a base of cubitus.
6. Strong notch present on the anterior margin near the base of hind wings.
7. Claws strongly curved.

In Japan, 13 species in 3 genera are recorded.



Genus Bethylus Latreille

- Bethylus Latreille, 1802. Hist. Nat. Crust. Insect., 3: 315.
- Perisemus Foerster, 1856. Hymen. Studien, II.: 95. [Synonymized by Kieffer, 1939.]
- Episemus Thomson, 1862. Forh. Ofvers. k. Vetensk. Akad., 18: 452. [Designated by Richards, 1939.]
- Digoniozus Kieffer, 1905. In Andre, Spec. Hymen. Eur. Alger., 9: 245. [Synonymized by Evans, 1962.]
- Anoxus Thomson, 1862. Svenska Vetrnskapsakademien. Stockholm. Oefversigt at K. Academiens. Forhandlingar, 18: 451. [Synonymized by Terayama, the part I in this article.]
- Anoxys: Dalla Torre, 1898. Catalogus Hym. hucusque desc. Syst. et Syn., 5: 550. [Unjustified emendation.]
- Japanese name: Arigatabachi-zoku.

Diagnosis. Medium to small sized species with the following combination of characteristics.

1. PF = 5, 2.
2. Clypeus short, not stringly angulated medially.
3. Antennae with 12 segments.
4. Notauli absent.
5. Parapsidal furrows present.
6. Propodeum with lateral carinae but without transverse carina.

7. Prostogma absent.
8. Basal vein arose to subcosta well separate
9. Basal vein forming almost a right angle and giving rise to a short stub.
10. Transverse median vein appearing to arise far based of basal vein.

This genus is restricted to the Palaearctic and the Nearctic regions, and short winged species are present.

Key to the Japanese species of Genus Bethylus

1. Forewings short, not reaching the posterior border of propodeum in both sexes .....B. sarobethsuensis sp. nov. [Hok]  
- Forewings fully developed, extending the posterior border of propodeum .....2
2. Clypeus broadly rounded (Fig. 427); mandibles with 5 teeth, basal tooth triangular .....B. pirika sp. nov. [Hok, Hon]  
- Clypeus truncate apically (Figs. 424, 426); mandibles with 4 teeth of which basal most large and truncated apically.....  
.....B. shiganus sp. nov. [Hon]



*Bethylus pirika* sp. nov.

(Figs. 425, 427)

Japanese name: Pirika-arigatabachi.

Holotype. Female. HL 0.95 mm; HW 0.83 mm; FW 0.53 mm; LA 1.35 mm; LP 0.55 mm; WPD 0.48 mm; FWL 2.35 mm; TL 3.9 mm.

Body black; coxae, trochanters, and femora blackish brown; mandibles, antennae, tibiae, and tarsi brown. Posterior 2/3 of forewings slightly brownish; pterostigma and veins brown.

Head 1.14 x as long as wide, HW 1.57 x FW; surface microreticulate with very shallow punctures sparsely. Anterior border of clypeus broadly rounded. Mandibles with 5 teeth; apical tooth largest; apical 2nd larger than the basal 3 teeth. First 5 segments of antennae in a ratio of about 9:5:5:5:4.5 in length; 2nd to 4th segments each 2.5 x as long as wide. Eyes 0.38 mm in maximum diameter, FW 1.39 x EL. Ocelli small; front angle of ocellar triangle ca. 60°; POL:AOL = 1:1; OOL 2.30 x WOT.

Pro- and mesonotum microreticulate; dorsal width of pronotum 0.58 mm. Pronotum microreticulate except median area smooth and shining.

Gaster smooth and shining.

Variation. Size vary in head length from 0.87 mm to 0.98 mm, and head width from 0.79 mm to 0.85 mm.

Holotype. Female, Kyushu Univ. Exp. Forest, Ashoro-machi, Hokkaido, 24-26.VI.1980, K. Maeto leg. [NIAES].

Paratypes. 1f, Ashorobuto, Ashoro-machi, Hokkaido, 27.VI.1980, H. Takemoto leg. [NIAES]; 3f, Shimamatsu, Hokkaido, 8.VII.1965, K. Kusigemati leg. [TE]; 1f, same locality, 12.VI.1967, K. Kusigemati leg. [KU-K]; 1f, Jyozan-kei, Hokkaido, 2.IX.1965, K. Kusigemati leg. [KU-K]; 5f, Rubesu, Shibetsu, Nemuro, Hokkaido, 25-28.VIII.1971, K. Yamagishi leg. [BMNH, USNM, CNC]; 1f, Sapporo, Hokkaido, 14.VI.1967, M. Suwa leg. [HUF]; 1f, Rokkasho-mura, Kamikita-gun, Aomori Pref., 4-5.VIII.1992 [TE]; 1f, Yamanaka-ko, Minami-tsuru-gun, Yamanashi Pref., 2.VIII.1978, Y. T. & H. Suda leg. [TE].

Distribution. Hokkaido, Honshu.

*Bethylus sarobetsuensis* sp. nov.

(Figs. 420-422)

Japanese name: Sarobetsu-arigatabachi.

Holotype. Female. HL 0.73 mm; HW 0.58 mm; FW 0.35 mm; AL 0.90 mm; LP 0.40 mm; WPD 0.28 mm; FWL 0.18 mm; TL 3.0 mm.

Body including mandibles black; anterior half of antennal scapes and antennal 2nd to 4th segments yellow, posterior half of scapes and antennal 5th to terminal segments brown; coxae, trochanters and femora blackish brown; tibiae brown; tarsi yellow.

Head elongate, 1.26 x as long as wide, with straight posterior border and rounded posterolateral borders in frontal view; surface microreticulate. Man-



dibles with 3 teeth; apical and middle teeth triangular; basal tooth broadly rounded. Anterior margin of clypeus broadly rounded. Antennae with 12 segments; first 5 segments in a ratio of about 6:3.5:2:2.8:3; 2nd segment 1.8 x as long as wide; 3rd segment slightly longer than wide. Eyes 0.30 mm in length, situated anterior portion of head in lareral view; FW 1.17 x EL. Ocelli small, forming a regular triangle; OOL 2.0 x WOT.

Pronotal disc as long as wide, with almost parallel sides and convex anterior border in frontal view; surface microreticulate. Dorsum of mesonotum microreticulate; mesoscutum 0.5 x as long as wide, scutellar disc 0.7 x as long as wide. Propodeum 1.25 x as long as wide, with subparallel sides in dorsal view; disc weakly microreticulate and rather shining in most part.

Gaster very weakly microreticulate and subopaque.

Wings extremely small; forewing oval, only extending beyond the anterior border of propodeum by about 1/3 of their length.

Paratype male. HL 0.63 mm; HW 0.53 mm; FW 0.33 mm; LA 0.78 mm; LP 0.30 mm; WPD 0.25 mm; FWL 0.10 mm; TL 2.9 mm.

Body black; mandibles and antennae yellow; fore coxae, trochanters, femora dark brown, tibiae yellowish brown, tarsi yellow; middle and hind legs dark brown except tarsi yellow.

General shape of head, pro- and mesonotum as in female. Propodeum 1.2 x as long as wide, gradually tapering to the posteriormost; dorsal surface weakly microreticulate and rather shining.

Forewings oval and small, only reaching the anterior border of propodeum.

Holotype. Female, Toyotomi, Sarobetsu, Hokkaido, 2.VIII.1961, C. Watanabe leg. [HUS].

Paratypes. 1f, 2m, same data as holotype [HUS].

Distribution. Hokkaido.

*Bethylus shiganus* sp. nov.

(Figs. 423-426, 428, 429)

Japanese name: Shiga-arigatabachi.

Holotype. Female. HL 0.68 mm; HW 0.61 mm; FW 0.39 mm; LA mm; LP 0.45 mm; WPD 0.43 mm; FWL 1.88 mm; TL 2.8 mm.

Body black; mandibles and antennae yellow; trochanters brown, femora blackish brown; anterior 1/3-1/2 of tibiae yellowish, lest brown; tarsi yellow.

Head as in Fig. 424. 1.11 x as long as wide, strongly microreticulate. Mandibles with 4 teeth; tip of apical 3 teeth bluntly pointed; basal tooth broad with truncate apice. Anterior border of clypeus trapezoidal, anterior border almost straight. First 5 segments of antennae in a ratio of about 7:4:3:3:3 in length; 2nd segment 2.2 x as long as wide; 3rd 2.3 x as long as wide. Eyes 0.29 mm in maximum diameter; FW 1.34 x EL. Ocelli small, frming an acute triangle; POL:AOL = 1:1; OOL 1.75 x WOT.

Pro- and mesonotum microreticulate; reticulation on scutellum less than



that on mesoscutum. Propodeum microreticulate except median area smooth and shining.

Gaster smooth and shining.

Holotype. Female, Shiga-kogen, Nagano Pref., 2-4.VIII.1967 [NIAES].

Distribution. Honshu.

Remarks. Known only from the type.

Genus *Odontepyris* Kieffer

*Odontepyris* Kieffer, 1904. Ann. Mus. Civ. Storia Nat. Genova, Ser. 3, 1: 378.

Japanese name: Washibana-arigatabachi-zoku.

Diagnosis. Medium to small sized wasps with the following combination of characteristics.

1. PF = 5, 3.
2. Median lobe of clypeus large and triangular.
3. Median carina of clypeus continues on well up the front.
4. Antennae with 13 segments.
5. Pronotum short, wider than long.
6. Notauli absent.
7. Scutellum with a pair of pits basally.
8. Propodeal disc with median, lateral, and transverse carinae.
9. A pair of pits present on base of propodeal disc.
10. Pterostigma large.
11. Prostigma present and rectangular.
12. Areola present (a few species absent).

*Odontepyris japonicus* sp. nov.

(Fig. 431)

*Prosielora* sp.: Terayama, 1990. Bull. Toho Gakuen, (5): 42.

Japanese name: Washibana-arigatabachi.



Holotype. Female. HL 1.20 mm; HW 1.28 mm; FW 0.85 mm; LA 2.20 mm; LPD 0.58 mm; WPD 0.95 mm; FWL 3.70 mm; TL 5.5 mm.

Body black; mandibles black; antennae dark brown, except undersides from scape to 7th segments yellow; coxae and femora black; trochanters, tibiae and tarsi yellow; wings brownish; veins brown, stigma dark brown.

Head wider than long with straight posterior border; HW 1.51 x FW; wider than maximum width of alitrunk; surface microreticulate with shallow punctures. Mandibles with 4 teeth. Clypeus strongly projecting anteriorly. First 5 segments of antennae in a ratio of about 14:5:7:7:6 in length; scape 2.5 x as long as wide; 2nd segment 1.6 x as long as wide; 3rd segment 2.0 x as long as wide. Eyes 0.53 mm in maximum length; FW 1.60 x EL.

Pronotum 1.03 mm in dorsal width; anterolateral corners rounded; surface microreticulate with shallow punctures sparsely. Mesonotum microreticulate; scutellar pits round, separated by 3.7 x their own diameter. Propodeal disc 0.61 x as long as wide; median area reticulate; sublateral areas with weak transvers rugae; declivity microreticulate. Forewings as in Fig. 431.

Holotype. Female, Ogano, Saitama Pref., 6.VII.1988, T. Nambu leg. [NIAES].

Paratypes. 1f, Sapporo, Hokkaido, 20.VIII.1927, K. Sato leg. [NASM]; 1f, Shumarinai-ko, Sorachi, Hokkaido, 8.VIII.1968, T. Nambu leg. [BMNH]; 1f, Kunitachi, Tokyo, 19.VI.1932, H. Yuasa leg. [NIAES]; 1f, Nagano-shi, Nagano Pref., 10.V.1932, K. Sato leg. [NASM]; 1f, Ohara, Komatsu-shi, Ishikawa Pref., 23.VII.1991, I. Togashi leg. [TE].

Distribution. Hokkaido, Honshu.

Genus *Gonozus* Foerster

*Gonozus* Foerster, 1856. Hymen. Studien II, p. 96.

*Parasierola* Cameron, 1883. Trans. Ent. Soc. London, 1883, :197. [Synonymized by Evans, 1978.]

*Progonozus* Kieffer, 1905. Ann. Sci. Soc. Bruxelles, 29: 105. [Synonymized by Evans, 1978.]

*Perasierola*, Kieffer, 1914. Das Tierreich, 41: 533-542. [Synonymized by Evans, 1978.]

Japanese name: Hamaki-arigatabachi-zoku.

Diagnosis. Small wasps with the following combination of the characteristics.

1. PF = 5, 3.
2. Clypeus with a strongly produced angular or subangular median lobe.
3. Eyes large, with or without erect hairs.
4. Antennae with 13 segments.
5. Notauli absent.
6. Scutellum with a transverse basal groove or a pair of small pits which are connected by a weak groove.
7. Propodeal disc with lateral carinae; transverse carina present, incomplete or absent.
8. Prostigma present, large and triangular.



9. Areola or a short vein arising from basal vein present.

The specimens which are identified as *G. platynotae* by Nawa (1902) are later described as a new species, *G. japonicus*, by Ashmead (1904). So I remove the record of *G. platynotae* which is later synonymized with *G. floridanus* to the Japanese fauna.

Key to the Japanese species of *Goniozus*

(Female)

- 1. Areola absent, any with a short vein arising from basal vein.....2
- Areola present.....5
- 2. Eyes elongate, 1.8 x as long as wide (Figs. 459, 460) .....
- ..... *G. eriae* sp. nov. [Hon, Kyu]
- Eyes wider, less than 1.6 x as long as wide (Fig. 434).....3
- 3. Pronotal disc narrow, 0.30 x as long as wide (Fig. 438); median and submedian cells of forewings without hairs .....
- ..... *G. kaiensis* sp. nov. [Hon]
- Pronotal disc broader, more than 0.45 x as long as wide (Fig. 436); median and submedian cells of forewings with decumbent hairs .....
- .....4
- 4. Lateral borders of clypeus forming a weak lobe (Fig. 458) .....
- ..... *G. japonicus* Ashmead [Hon, Shi, Kyu, Ryu]

- Lateral borders of clypeus transverse, not forming a distinct lobe (Fig. 457) .....
- ..... *G. yezo* sp. nov. [Hok]
- 5. Head elongate, more than 1.2 x as long as wide (Fig. 449) .....
- .....6
- Head shorter, less than 1.1 x as long as wide .....
- .....7
- 6. Posterolateral corners with 2 pairs of distinctly long hairs .....
- ..... *G. hoorai* sp. nov. [Ryu]
- Posterolateral corners of head without remarkably long hairs .....
- ..... *G. yoshikawai* sp. nov. [Hon, Kyu]
- 7. Eyes covered with numerous erect hairs; 3rd segment of antennae thin and long, 2.0 x as long as wide..... *G. tosaensis* sp. nov. [Shi]
- Eyes only sparsely covered with hairs or hairless; 3rd segment of antennae thick and short, less than 1.5 x as long as wide.....9
- 8. Posterolateral borders of head angulate in frontal view; middle and hind tibia black to blackish brown.....
- ..... *G. akitsushimanus* sp. nov. [Hon, Kyu]
- Posterolateral borders of head at most dully angulate in frontal view; middle and hind tibia yellow to yellowish brown .....
- .....9
- 9. Propodeal disc entirely microreticulate .....
- ..... *G. iyonis* sp. nov. [Shi]
- Propodeal disc with at least median area smooth and shining .....
- ..... *G. kusigematii* sp. nov. [Kyu, Okinawa]



Table 25. Character matrix of Japanese species of *Goniozus*.

|                         | Hairs  |         | Shape   |
|-------------------------|--------|---------|---------|
|                         | Areola | on eyes | of head |
| <i>G. eriae</i>         | -      | -       | r       |
| <i>G. kaiensis</i>      | -      | -       | r       |
| <i>G. japonicus</i>     | -      | -       | r       |
| <i>G. yezo</i>          | -      | -       | r       |
| <i>G. hoorai</i>        | +      | +       | r       |
| <i>G. yoshiokai</i>     | +      | +       | R       |
| <i>G. tosaensis</i>     | +      | ++      | r       |
| <i>G. akitsushmanus</i> | +      | +       | R       |
| <i>G. iyonis</i>        | +      | -       | r       |
| <i>G. kusigematii</i>   | +      | -       | r       |

Hairs on eyes. -: absent. +: present. ++: abundant.

Shape of head. r: round. R: rectangular.

*Goniozus japonicus* Ashmead

(Figs. 433-436, 439-440, 458)

*Goniozus japonicus* Ashmead, 1904. Jour. New York Ent. Soc., 12: 67.

*Goniozus japonicus*: Yasumatsu, 1933. Hakubutsu, 3: 1.

*Goniozus japonicus*: Watanabe, 1940. Insecta Matsumurana, 14: 85.

*Goniozus platynotae*: Nawa, 1902. Catalogue of Insects, 1st insects exhibition forum in Japan, (42): 8. [Misidentification.]

Japanese name: Hamaki-arigatabachi. [Hamaki-yadoribachi, Kiguma, 1899;

Hamaki-tamagobachi, Matsumura, 1908; Hamaki-arigatabachi, Yasumatsu,

1950.]

Redescription of holotype. Female. Head as in Fig. 439; lateral head length and width 0.75 mm and 0.35 mm respectively. Eyes 0.43 mm in length. First 5 antennal segments in a ratio of about 5:3.5:2.5:3:3 in length. Alitrunk 1.25 mm in length.

HL, HW, and FW did not measure because the specimen has detached on the small board by turn backed body position. Gaster lacking.

Female. HL 0.65-0.75 mm; HW 0.60-0.65 mm; FW 0.35-0.36 mm; LA 1.10-1.28 mm, LPD 0.31-0.35 mm; WPD 0.50-0.54 mm; FWL 2.01-2.18 mm; TL 2.7-3.5 mm. (20 individuals were measured.)

Body black; mandibles yellow; antennae yellow, from 6 or 7th segments to terminal segment brownish; coxae and femora dark brown; trochanters, tibiae



and tarsi yellowish brown.

Head longer than wide, 1.09-1.15 x as long as wide, with weakly convex to almost straight posterior border; HW 1.71-1.80 x FW; frons and vertex microreticulate and scattered with very shallow and weak punctures; gena smooth and shining. Mandibles with 4 acute teeth. Median lobe of clypeus narrow, forming an acute angle apically; lateral lobes weakly rounded. Antennal scapes 2.1-2.3 x as long as wide; 2nd to 4th segments each longer than wide. Eyes 0.39-0.40 mm in length; 1.6 x as long as wide. Posterior ocelli located almost near the posterior border; POL: AOL = 5:11; OOL 0.8 x WOT.

Pronotal disc 0.46 x as long as wide; anterolateral borders dully angulate, posterior border very weakly convex; surface microreticulate and scattered with very shallow weak punctures. Mesonotum microreticulate, but reticulation slightly weaker than that on head and pronotum. Propodeal disc 0.62-0.65 x as long as wide; lateral borders slightly narrowing at posterior 1/4; basal triangular smooth and shining, elsewhere strongly microreticulate.

Gaster almost smooth and shining. Forewings without areola; median and submedian cells with decumbent hairs.

Male. General shape as in female, but ocelli larger and strongly produced; POL:POL = 3:1; OOL 0.5 x WOT; DAO 0.07-0.08 mm.

Material examined. Japan. Gifu, Japan, X.1902 (holotype, female) [holotype No. 7111, USNM]; 2f, Nangoku-shi, Kochi Pref., 6.VI.1991, (reared from *Lobesia aeolopa*); 1f, Mt. Takao-san, Tokyo, 29.IX.1963, J. Minamikawa leg.; 15f, 2m, Saitama Pref., 14.VII.1966, K. Uchibori leg. (reared from *Archips* sp.); 5f,

Saitama Pref., 18.V.1964, K. Uchibori leg. (reared from *Archips* sp.); 1f, Monomi-yama, Higashi-matsuyama-shi, Saitama Pref., 7.IV.1993, Tamaki leg.; 4f, Anou, Mie Pref., 16-20.VI.1988, T. Okada leg.; 3ff, Myoken-ji Temple, Niizo, Toda-shi, Saitama Pref., 15.X.1986, M. Hasegawa leg.; 1f, Sasaguchihama, Nakajo-machi, Niigata Pref., 6.VI.1980, K. Maeto leg.; 1m, Yokohama, Kanagawa Pref., 19.IX.1935, K. Sato leg.; 2ff, same locality, 22.VIII.1938, K. Sato leg.; 1f, same locality, 31.VIII.1941, K. Sato leg.; 2ff, Kanaya, Shizuoka Pref., 20.VIII.1952, J. Minamikawa leg.; 1f, same locality, 25.IX.1954, J. Minamikawa leg.; 1f, Tsu-shi, Mie Pref., VIII.1956, K. Tsutsui leg. (reared from *Glyphodes pyloalis*); 1f, Nagasaki Pref., 1923, T. Ishii leg.; 1f, Nakazawa, nr. Mt. Takao-san, Tokyo, 16.IV.1978, A. Shinohara leg.; 1f, Fuchu, Tokyo, 9.VIII.1955, A. Habu leg.; 1f, Kawanami-cho, Koyu-gun, Miyazaki Pref., 21.VI.1962, J. Minamikawa leg.; 1f, Ohta-shi, Shimane Pref., 8.VIII.1961, Teraguchi leg.; 1f, Kamakura, Kanagawa Pref., 22.IV.1950, H. Nagase leg.; 5f, Tokyo, 1960, J. Minamikawa leg., (reared from *Glyphodes pyloalis*); 3f, Tsunashima, Yokohama, Kanagawa Pref., 13.VIII.1938, K. Sato leg., (reared from *Olethreutus acharis*?); 1f, Tenryu-kyo, Nagano Pref., 5.VI.1950, K. Sato leg.; 1f, Mt. Senpyomaki, Tsushima is., Nagasaki Pref., 30.IV.1989, K. Konishi leg.; 1m, Fukuoka-shi, Fukuoka Pref., 5.X.1953; 1f, Sata, Izashiki-Toyamazaki, Kagoshima Pref., 23.V.1952, Esaki & Hirashima leg.; 3f, Okinoshima, Fukuoka Pref., 25-28.VII.1958, Hirashima, Murakami & Y. Miyatake leg.; 1f, Hirao, Fukuoka-shi, Fukuoka Pref., 5.V.1954; 1f, same locality, 18.V.1959, Y. Murakami leg.; 1f, Mt. Tachibana, Fukuoka Pref., 18.V.1968, Y. Yoshida leg.;



1f. Mt. Tenjosan, Fukui Pref., 24.VII.1956, Y. Murakami leg.; 1f. Kagoshima Pref., 14.VII.1955, Y. Hirashima leg.; 1f. Kamiozoegawa, Fuji, Saga Pref., 25.IX.1973, K. Yamagishi leg.; 1f. same locality, 6.IX.1973, K. Yamagishi leg.; 2f. same locality, 28.IV.1973, K. Yamagishi leg.; 1m. same locality, 6.IX.1973, K. Yamagishi leg.; 4f, 1m, Takamatsu, Kagawa Pref., 5.VIII.1948, K. Iwata leg.; 1f. Kurihara, Onomichi, Hiroshima Pref., 24.I.1932, K. O. leg.; 2f. Taterayama, Tsushima I., Nagasaki Pref., 27.IX.1959, Hidaka, Kamiya, K. Morimoto & T. Kawarabata leg.; 1f. same locality, 28.IX.1960, Hidaka, Morimoto, Kamiya & Kawarabata leg.; 1f. Azamo-Taterayama, Tsushima I., Nagasaki Pref., 27.IX.1959, Hidaka, Morimoto, Kamiya & Kawarabata leg.; 3f. Okago-Fuji, Hachijo-jima I., Tokyo, 26.V.1964, Y. Hirashima & M. Shiga leg.; 2f. Eigo, Hachijo-jima I., Tokyo, 2.VI.1964, Y. Hirashima & M. Shiga leg.; 1f. Mitsune-Kantoyama, Hachijo-jima I., Tokyo, 30.V.1964, Y. Hirashima & M. Shiga leg.; 1f. Sueyoshi, Hachijo-jima I., Tokyo, 28.V.1964, Y. Hirashima & M. Shiga leg.; 4f, 1m, Saiwai-cho, Fuchu-shi, Tokyo, VIII.1988, H. Kunimi leg.; 3f. Kagoshima-shi, Kagoshima Pref., VIII.1975, K. Kusigemati leg., (reared from lepidopteran larva); 1m, Hikosan, Fukuoka Pref., 2. VIII.1930, K. Yasumatsu leg.; 1m, Yorii-machi, Saitama Pref., 27.IX.1979, T. Nambu leg.; 1f, Eigou, Hachijo-jima I., Tokyo, 11.X.1988, H. Takahashi leg.; 2f, Wakuri, Ichinomiya-shi, Aichi Pref., 13.IX.1970, S. Ohkusa leg.; 2f, Sugitate, Matsuyama-shi, Ehime Pref., 22.XI.1970, M. Sakai leg.; 1f, Mt. Kurino-dake, Kagoshima Pref., 23.V.1969, K. Kusigemati leg.; 1f, Shimota, Kagoshima Pref., 9.XI.1969, K. Kusigemati leg.; 1f, Terayama, Kagoshima-shi, Kagoshima Pref., 12.VIII.1978,

K. Kusigemati leg.; 1f, same locality, 27.IV.1970, K. Kusigemati leg.; 2f, same locality, 1.V.1970, K. Kusigemati leg.; 2f, same locality, 8.V.1970, K. Kushigemachi leg.; 3f, Toso, Kagoshima Pref., 10.IX.1970, K. Kusigemati leg.; 1f, Miike, Takaharu-machi, Miyazaki Pref., 20.V.1982, H. Takemoto leg.; 1f, Fuchu-shi Tokyo, 20.V.1988, M. T. & E. N. leg.; 1f, same locality, 9.VIII.1955, A. Habu leg.; 1f, Takagi, Kasugai-shi, Aichi Pref., 18.XI.1967, Y. Arita leg.; 1f, Mt. Takao-san, Tokyo, 20.VIII.1987, K. Konishi leg.; 2f, Ikuta, Kawasaki-shi, Kanagawa Pref., 8.IX.1972, Y. Yoshikawa leg.; 1f, same locality, 5.V.1971, Y. Yoshikawa leg.; 1f, same locality, 17.VI.1972, Y. Yoshikawa leg.; 2f, same locality, 3.VII.1972, Y. Yoshikawa leg.; 1f, same locality, 19.IX.1972, Y. Yoshikawa leg.; 1f, same locality, 19.VI.1972, Y. Yoshikawa leg.; 3f, Yoga, Setagaya-ku, Tokyo, 5.X.1972, Y. Yoshikawa leg.; 1f, same locality, 2.X.1972, Y. Yoshikawa leg.; 1f, Kinuta Park, Ohkura, Setagaya-ku, Tokyo, 5.X.1969, Y. Yoshikawa leg.; 1f, Iwatsuki-shi, Saitama Pref., 4.VIII.1964, Y. Yoshikawa leg.; 1f, Nogami, Chichibu, Saitama Pref., 28.VIII.1971, Y. Yoshikawa leg.; 1f, Hiroshima Pref., 28.VIII.1955, T. Ishihara leg.; 1f, Matsuyama-shi, Ehime Pref., 11.V.1954, S. Ueda leg.; 1f, Minatoyama, Matsuyama-shi, Ehime Pref., 8.VI.1955, S. Hisamatsu leg.; 1f, Kaname-cho, Hitoyoshi-shi, Kumamoto Pref., 6.VI.1956, H. Mayehara leg.; 3ff, Azai-cho, Shiga Pref., 15.VII.1990, N. Teramoto leg., (reared from *Hystichosolus spathantum*); 1f, Fukaya-shi, Saitama Pref., 11.XII.1967, T. Nambu leg.; 1f, Kamakita-ko, Yorii-machi, Saitama Pref., 6.V.1973, T. Nambu leg.; 2f, Yorii-machi, Saitama Pref., 27.IX.1979, T. Nambu leg.; 1f,



Kashiwajima, Kochi Pref., 4.VII.1961, M. Miyatake leg.; 1f, Bouno-misaki, Kagoshima Pref., 27.IV.1966, K. Kusigemati leg.; 1f, Tokyo, 5.V.1961, J. Minamikawa leg.; 1f, Jyuriki, Okutama, Tokyo, 12.V.1974, S. Katsuya leg.; 5ff, Nisshin-cho, Aichi Pref., 21.III.1971, K. Yamagishi leg.; 2ff, Yamadera, Ojiya, Niigata Pref., 20.VIII.1970, K. Yamagishi leg.; 1f, Mt. Sanage-yama, Aichi Pref., 9.X.1970, K. Yamagishi leg.; 3ff, Kooridono, Ojiya, Niigata Pref., 1.VIII.1970, K. Yamagishi leg.; 1m, Mt. Aso-zan, Kumamoto Pref., 6.XI.1965, J. Minamikawa leg.; 2f, Kurio, Yakushima I., Kagoshima Pref., 13.VII.1970, K. Yamagishi leg.; 1f, Koshima, Yakushima I., Kagoshima Pref., 8.VII.1970, K. Yamagishi leg.; 1f, Hinokuchi, Yakushima I., Kagoshima Pref., 27-30.III.1971, K. Yamagishi leg.; 1f, Isso, Yakushima I., Kagoshima Pref., 18.X.1971, K. Kusigemati leg.; 1f, Onoaida, Yakushima I., 15.VI.1972, K. Kusigemati leg.; 1f, Ohgachi, Amami-ohshima I., Kagoshima Pref., 8.XI.1962, Y. Miyatake leg.; 1f, Hatsuno, Amami-ohshima I., Kagoshima Pref., 11.XI.1962, Y. Miyatake leg.; 1f, Yakkachi, Amami-ohshima I., Kagoshima Pref., 12.XI.1962, Y. Miyatake leg.; 1f, Kuchino-shima I., Tokara Is., Kagoshima Pref., 26.VI-3.VII.1969, H. Makihara leg.; 2f, Kunigami-son, Okinawa-jima I., Okinawa Pref., 10-11.X.1988, K. Konishi leg.; 1f, Hedo, Kunigami-son, Okinawa-jima I., Okinawa Pref., 5.IV.1979, K. Kusigemati leg.; 1f, Benoki, Kunigami-son, Okinawa-jima I., Okinawa Pref., 7.IV.1979, K. Ohara leg.; 1f, Uebaru, Nakijin, Okinawa-jima I., Okinawa Pref., 1.V.1991, M. Hayashi leg.; 1f, Ohara, Iriomote-jima I., Okinawa Pref., 19.I.1953, T. Shiraki leg.; 1f, Hirari, Ishigaki-shi, Ishigaki-jima I., Okinawa Pref., H. Hasegawa leg., 1f, Mt.

Banna-dake, Ishigaki-jima I., Okinawa Pref., 7-9.IX.1969, H. Makihara leg.  
Korea, 2f, Mt. Sudosan, 700m alt., Kyongsangpuk-do, 9-12.VII.1971, K. Yamagishi leg.; 3f, Mt. Sudosan, 1000m alt., Kyongsangpuk-do, 13-14.VII.1971, Y. Yamagishi leg.; 3f, Mt. Sudosan, 400m alt., 17-18.VII.1971, K. Yamagishi leg.; 1f, Tokchokto I., Kyonggi-do, 20.VIII.1990, M. Terayama leg.; 1f, Suigen, Keikido, 21.IV.1938, K. Sato leg.  
Taiwan, 1f, Yuchih, 7.V.1971, N. Fukuhara leg.; 1f, Antung Spa., Hualien, 1.V.1985, A. Saito leg.

Remarks. Although Ma (1935) recorded this species from Hangchow, East China in his catalogue, it is needed exact distribution record from China.

Distribution. Japan (Tohoku district to Yaeyama Is. of Ryukyus), Taiwan (new record), Korea (new record), China (?).

Host. The host record is shown as Table 28.

Biology. Biological observation was made by Iwata (1949, 1961), Kishitani (1961, 1962), Yukinari (1976, 1979) and others.

This species are parasitic of leaf-eating microlepidopteran larvae. A single female lays about 100 eggs during the survival period, the number of eggs per host is 1 to 7 in usual (the maximum case is 16). The longevity of the males are one-half of the females and the longest survival period is 43 day in the females at 25 c. This has at least 6 generation a year at Kansai district of Honshu. The hibernation is carried out by adult stage.

The sex-ratio produced by fertilized mother wasp is about 7:3 in female:male. Virgin females produce parthenogenetically male.



Two hymenopterous parasites, *Pediobius nawai* and *Eurytoma* sp., are known in this species up to the present (Tachikawa & Yukinari, 1974).

Table 26. Host record of *Goniozus Japonicus*.

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| Subfamilies and species   |
|---|
| Gelechiidae (5 spp.)  |
| <i>Campsolechia homoplasta</i> ; <i>Dactylethrella tegulifera</i> , <i>Dichomeris tostella</i> ,<br><i>Evippe syricitis</i> ; <i>Helcystogramma macroscopum</i> .   |
| Gracillariidae (4 spp.)   |
| <i>Caloptilia chrysolampra</i> ; <i>C. elongella</i> ; <i>C. soyella</i> ; <i>C. theivora</i> .   |
| Pyrilidae (3 sp.)   |
| <i>Glyphodes pyloalis</i> ; <i>Pleuroptya balteata</i> ; <i>P. chlorophanta</i> .   |
| Tortricidae (15 spp.)   |
| <i>Adoxophyes orana</i> (= <i>fasciata</i> ); <i>Apotomis geminata</i> ; <i>Archips fuscocupreanus</i> ; <i>A.</i><br><i>semistructus</i> ; <i>A. semistructa</i> ; <i>A. fasciata</i> ; <i>A. longicellana</i> ; <i>Capua vulgana</i><br>(= <i>flavillaceana</i> ); <i>Choristoneura diversana</i> ; <i>Eucoenogenes ancyrota</i> ; <i>Homona</i><br><i>magnanima</i> ; <i>Matsumuraeses phaseoli</i> ; <i>Notarcha derogata</i> ; <i>Palpita nigropunctalis</i> ;<br><i>Saliciphaga acharis</i> . |
| Olethreutidae (2 spp.)  |
| <i>Epinotia ancyrota</i> ; <i>Hystrichosolus spathanum</i> .  |

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*Goniozus yezo* sp. nov.

(Figs. 456-457)

Japanese name: Ezo-hamaki-arigatabachi.

Holotype. Female. HL 0.68 mm; HW 0.66 mm; FW 0.43 mm; LA 1.13 mm; LPD 0.33 mm; WPD 0.63 mm; FWL 2.40 mm; TL 3.0 mm.

Head and alitrunk black; gaster back, 1st and anterior half of 2nd gastral tergite brownish; mandibles reddish brown; antennae yellow; fore coxae, trochanters, and femora dark brown, tibiae and tarsi yellow; middle and hind legs dark brown except tarsi yellow.

Head nearly as long as wide with straight posterior border in frontal view; HW 1.53 x FW; microreticulate and scattered with shallow weak punctures. Mandibles with 4 acute teeth. Median lobe of clypeus narrow, less than a right angle, with rounded tip. Lateral portions of anterior border of clypeus straight, not forming a lobe. First 4 segments of antennae in a ratio of about 11:5:5:5 in length; 2nd segment as long as wide; 3rd segment slightly longer than wide. Eyes 0.36 mm in length; 1.81 x as long as wide; FW 1.19 x EL. Cellular triangle flat; posterior ocelli situated near occipital border of head; POL:AOL = 5:2; OOL 1.13 x WOT.

Pronotal disc 0.41 x as long as wide; anterolateral corners rounded, not forming a distinct angle in frontal view; surface microreticulate. Mesonotum microreticulate. Propodeal disc 0.53 x as long as wide, with almost parallel



lateral borders and straight posterior border in dorsal view; basal triangular and posterior portion of median area smooth and shining, remainder strongly microreticulate.

Gaster smooth and shining. Forewings without areola; median and submedian cells with decumbent short hairs.

Holotype. Female, Maruyama, Sapporo, Hokkaido, 5.VI.1957, S. Momoi leg. [HUS].

Paratype. 1f, Sapporo, Hokkaido, 1.VI.1961, H. Takada leg. [HUS].

Distribution. Japan (Hokkaido).

*Goniozus eriae* sp. nov.

(Figs. 459-460)

Japanese name: Eri-hamaki-arigatabachi.

Holotype. HL 0.94 mm; HW 0.58 mm; FW 0.33 mm; LA 1.05 mm; LPD 0.35 mm; WPD 0.50 mm; FWL 2.00 mm; TL 3.0 mm.

Head and alitrunk black; gaster black except 1st and anterior half of 2nd gastric tergites brown; mandibles and antennae yellow; fore coxae and femora dark brown, trochanters, tibiae and tarsi yellow; middle and hind legs yellowish brown, femora brownish.

Head elongate, 1.62 x as long as wide; posterolateral corners dully angulate in frontal view; HW 1.76 x FW; surface microreticulate. Mandibles with 4

teeth. Median lobe of clypeus narrow, tip shapely angulate; lateral lobes rounded; median carina strongly arched in profile. First 4 antennal segments in a ratio of about 6:3:2:2 in length; 2nd segment longer than wide; 3rd as long as wide. Eyes long as in Fig. 460; 0.36 mm in length; 1.81 x as long as wide; FW 0.91 x EL. POL:AOL = 5:2; OOL 0.94 x WOT.

Pronotal disc 0.50 x as long as wide, anterior border almost straight, anterolateral corners weakly angulate; surface microreticulate. Mesonotum microreticulate. Propodeum 0.70 x as long as wide; basal triangular area smooth and shining; elsewhere distinctly reticulate.

Gaster smooth and shining. Forewings without areola; median and submedian cells with decumbent short hairs.

Holotype. Female, Kirishima-jingu, Kagoshima Pref., 20.IX.1980, H. Nagase leg. [TE].

Paratype. 1f, Tokyo, 25.VIII.1938, N. Suyetake leg. [NASM].

Distribution. Honshu, Kyushu.

*Goniozus kaiensis* sp. nov.

(Figs. 437-438)

Japanese name: Kai-hamaki-arigatabachi.

Holotype. HL 0.68 mm; HW 0.78 mm; FW 0.45 mm; LA 1.23 mm; LPD 0.38 mm; WPD 0.60 mm; FWL 2.28 mm; TL 3.2 mm.



Body testaceous; mandibles, antennae, tibiae, and tarsi yellow.

Head wider than long, 0.87 x as long as wide; surface microreticulate and scattered with shallow punctures; gena smooth and shining. Mandibles with 4 teeth. Median lobe of clypeus rather narrow, with dully angulated tip. First 4 segments of antennae in a ratio of about 6:3:2.5:2.5 in length; 2nd segment somewhat longer than wide; 3rd as long as wide. Eyes 0.40 mm in length; 1.68 x as long as wide; FW 1.12 x EL. Ocelli large and DAO ca. 0.06 mm; ocellar triangle flat; POL:AOL = 2:1; OOL 0.73 x WOT.

Pronotal disc narrow, 0.30 x as long as wide; reticulation stronger than that on head. Mesonotum rather smooth and shining, only very weakly microreticulate. Propodeal disc 0.63 x as long as wide; basal triangular area smooth and shining; elsewhere reticulate.

Gaster smooth and shining; maximum width 0.88 mm as seen from above.

Median and submedian cells of forewings without hairs; areola absent.

Holotype. Female, kurio, Yamanashi Pref., 16.VIII.1970, K. Dobashi leg. [NIAES].

Remarks. Known only from the type.

Distribution. Honshu.

*Goniozus akitsushimanus* sp. nov.

(Figs. 454-455)

Japanese name: Kakugao-hamaki-arigatabachi.

Holotype. HL 0.57 mm; HW 0.55 mm; FW 0.34 mm; LA 1.10 mm; LP 0.38 mm; WPD 0.43 mm; FWL 1.85 mm; TL 2.8 mm.

Body including mandibles black; antennal scapes dark brown, funiculus yellow; legs dark brown except anterior portion of tibiae and tarsi yellow.

Head 1.04 x as long as wide, microreticulate; HW 1.6 x FW. Mouth parts not dissected. Median lobe of clypeus rather narrow, forming nearly a right angle. First 5 segments of antennae in a ratio of about 4:2:1.5:1.8:2 in length; 2nd segment slightly longer than wide; 3rd segment as long as wide. Eyes 0.26 mm in length; EL 1.3 x EW; FW 1.3 x EL; hairless. Front angle of ocellar triangle obtuse; POL:AOL = 2:1; OOL 1.25 x WOT.

Pronotal disc 0.45 x as long as wide and microreticulate. Mesonotum microreticulate. Propodeum slightly wider than long; broadest at anteriormost; posterodorsal borders rounded, not forming an angle; transverse carina absent; median area of disc smooth and shining, remainder reticulate; declivity reticulate.

Gaster smooth and shining. Forewings without areola.

Variation. Specimens examined vary in head length from 0.50 to 0.58 mm, and in head width from 0.50 to 0.58 mm.

Holotype. Female, Ikuta, Kawasaki-shi, Kanagawa Pref., 17.VI.1972, Y.



Yoshikawa leg. [NIAES].

Paratypes. 1f, Setagaya, Tokyo, XII.1971. Y. Watanabe leg. [TE]; 1f, Kamiozegawa, Fuji, Saga Pref., 28. IV.1973, K. Yamagishi leg. [TE]; 1f, Shimura, 11. IV.1935, H. Ise leg. [NIAES].

Distribution. Honshu, Kyushu.

*Goniozus hoorai* sp. nov.

(Fig. 443)

Japanese name. Horai-hamaki-arigatabachi.

Holotype. Female. HL 0.60 mm; HW 0.55 mm; FW 0.35 mm; LA 0.93 mm; LPD 0.30 mm; WPD 0.43 mm; FWL 1.7 mm; TL 2.4 mm.

Body black; mandibles dark brown; antennae and legs yellow.

Head 1.09 x as long as wide, with straight posterior border in frontal view; surface coarsely microreticulate; long whitish hairs present at near the occipital border, the longest hair ca. 0.18 mm. Median lobe of clypeus rather narrow, forming an acute angle. First 5 segments of antennae in a ratio of about 6:2:2:2:2.2 in length; 2nd segment as long as wide. Eyes with short erect hairs which are ca. 0.33 mm long. Ocelli relatively large and DA0 0.05 mm; ocellar triangle flat; POL:AOL = 2:1; OOL 0.8 x WOT.

Pronotal disc 0.45 x as long as wide, microreticulate. Disc of mesonotum rather flat, microreticulate. Propodeal disc 0.70 x as long as wide, with parallel lateral borders and straight posterior border in dorsal view; transverse carina distinct; median area smooth and shining; remainder microreticulate; declivity rather strongly microreticulate.

Forewings with closed areola.

Holotype. Female, Nantou, Meifeng (alt. 2140 m), Taiwan, 3-15. X.1990, C. R. Starr leg. [CNC].

Paratypes. 1f, Kubura, Yonaguni-jima I., Okinawa Pref., 9. VIII.1979, M.



Terayama leg. [TE; gaster lacking]; 1f, Hirara, Miyako-jima I., Ryukyu Is., Okinawa Pref., 17-23.VIII.1969, H. Makihara leg. [KUF]; 1m, Yona, Okinawa-jima I., Okinawa Pref., 11.V.1972, S. Okajima leg. [TE]; 1f, Shinmura, Yuwan, Amami-oshima I., Kagoshima Pref., 4.IV.1956, S. Miyamoto leg. [KUF].

Distribution. Japan (Ryukyus), Taiwan.

*Goniozus iyonus* sp. nov.

(Figs. 444-447)

Japanese name: Iyo-hamaki-arigatabachi.

Holotype. Female. HL 0.70 mm; HW 0.68 mm; FW 0.43 mm; LA 1.15 mm; LP 0.43 mm; WPD 0.53 mm; FWL 2.4 mm; TL 3.3 mm.

Body black; 1st and 2nd gastral tergites brownish; mandibles blackish brown except apices brownish; antennae yellow to brown; coxae, trochanters and femora blackish brown; fore tibiae and tarsi yellow; anterior half of middle and hind tibiae brown, posterior half yellow; middle and hind tarsi yellow.

Head almost as long as wide, with weakly concave posterior border in frontal view; surface microreticulate. Mandibles with rounded outer margin. Median lobe of clypeus narrow, forming an acute angle. Antennae short; first 5 segments in a ratio of length from the base about 7.5:3:3:3.5:3; 2nd to 5th segments each slightly longer than wide. Eyes without hairs and 0.35 mm in length; WF 1.23 x LE. Ocelli rather large in an obtuse triangle; DAO ca. 0.06

mm; POL:AOL = 5:2; OOL 0.8 x WOT.

Pronotal disc 0.41 x as long as wide; pro- and mesonotum microreticulate. Propodeum 0.81 x as long as wide, without transverse carina; basal triangular area smooth and shining; remainder densely microreticulate; declivity relatively weakly microreticulate.

Gaster smooth and shining. Forewings with closed areola.

Holotype. Female, Matsuyama, Ehime Pref., 7.II.1954, F. Takechi leg. [TE].

Remarks. Known only from the type.

Distribution. Shikoku.

*Goniozus kusigematii* sp. nov.

(Fig. 448)

Japanese name: Minami-hamaki-arigatabachi

Holotype. Female. HL 0.75 mm; HW 0.69 mm; FW 0.40 mm; LA 1.20 mm; LPD 0.33 mm; WPD 0.50 mm; FWL 2.4 mm; TL 3.2 mm.

Body black to blackish brown; mandibles and antennae yellow; coxae and femora blackish brown; trochanters, tibiae and tarsi yellow.

Head longer than wide, with straight posterior border in frontal view; malar area broad in lateral view; surface microreticulate with shallow punctures sparsely except malar areas smooth and shining. Mandibles with 4 teeth. Median lobe of clypeus narrowly convex anteriorly. First 5 segments of an-



tennae in a ratio of about 7:2.5:2.5:3:3 in length; 2nd to 5th segments each slightly longer than wide. Eyes hairless; 0.40 mm in length; EL 1.0 x FW. Ocellar triangle very flat; anterior ocelli almost reaching the level of posterolateral ocellus in frontal view; POL:AOL = 5:2; OOL 0.89 x WOT.

Pronotal disc 0.38 x as long as wide, surface micrireticulate. Mesonotum microreticulate. Propodeal disc 0.66 x as long as wide; transverse carina strong; median area smooth and shining; remainder reticulate; declivity mostly smooth and shining, but weakly microreticulate.

Gaster smooth and shining. Forewings with closed areola.

Holotype. Female, Bonomisaki, Kagoshima Pref., 27. IV. 1966, K. Kusigemati leg. [NIAES].

Paratypes. 1f, Satamisaki, Kagoshima Pref., 18. V. 1966, K. Kusigemati leg. [KU-K]; 1f, Hedo, Kunigami-son, Okinawa-jima I., Okinawa Pref., 5. IV. 1979, K. Ohara leg. [TE].

Distribution. Kyushu, Ryukyus (Okinawa-jima I.).

*Goniozus tosaensis* sp. nov.

(Figs. 441-443)

Japanese name: Tosa-hamaki-arigatabachi.

Holotype. Female. HL 0.68 mm; HW 0.68 mm; FW 0.38 mm; LA 1.08 mm; LPD 0.35 mm; WPD 0.50 mm; FWL 2.10 mm; TL 3.0 mm.

Body black with brownish tinge; 1st and 2nd gastral tergites blackish brown; mandibles, antennae and legs yellow.

Head as long as wide, with very weakly convex posterior border in frontal view; frons and vertex microreticulate rugosely; genal areas smooth and shining and narrow in lateral view. Mandibles with 4 teeth; apical tooth acute and longest. Median lobe of clypeus forming nearly a right angle; median carina strongly arched in profile. First 5 segments of antennae in a ratio about 6:3:3.5:3:3 in length; scape 1.7 x as long as wide; 2nd segment 1.5 x as long as wide; 3rd segment 1.9 x as long as wide. Eyes with coarse standing hairs; length 0.40 mm; 1.68 x as long as wide; FW 0.95 x EL. Ocellar triangle flat; POL:AOL = 2:1; WOT 0.87 x OOL.

Pronotal disc 2.5 x as long as wide; pro- and mesonotum microreticulate rugosely but microreticulum weaker than that on head. Pronotal disc 0.70 x as long as wide; median area smooth and shining; remainder reticulate; declivity weakly reticulate.

Gaster smooth and rather subopaque. Forewings with closed areola.

Holotype. Female, Kuroson, Kochi Pref., 29. IV. 1956, Y. Murakami leg. [TE].



Paratype. Kamiozegawara, Fuji, Saga Pref., 10.VIII.1973, K. Yamagishi leg. [KUF].

Distribution. Shikoku, Kyushu.

Remarks. This distinctive species is known only 2 individuals from Kochi and Saga Prefectures.

*Goniozus yoshikawai* sp. nov.

(Figs. 449-452)

Japanese name: Omonaga-hamaki-arigatabachi

Holotype. HL 0.60 mm; HW 0.50 mm; FW 0.31 mm; LA 0.93 mm; LP 0.31 mm; WPD 0.33 mm; FWL 1.60 mm; TL 2.7 mm.

Body black; mandibles black; posterior half of antennal scapes and antennal 2nd to 5th segments yellow, remainder of antennae brown; coxae and femora brown, trochanters; tibia and tarsi yellow.

Head longer than wide, 1.20 x as long as wide, with straight posterior border in frontal view, microreticulate. Mandibles with 4 teeth. Median lobe of clypeus rather broad, forming an obtuse angle. First 5 segments of antennae in a ratio of about 5:2.8:1.8:2:2 in length; scape short, 1.7 x as long as wide; 2nd segment longer than wide; 3rd to 5th segments each as long as wide. Eyes with short standing hairs; EL 0.28 mm; EL 1.64 x EW; WF 1.11 x EL. Front angle of ocellar triangle obtuse; POL:AOL = 3:2; OOL 1.18 x WOT.

Pronotal disc 0.5 x as long as wide, microreticulate. Mesonotum microreticulate. Propodeal disc narrowest at posteriormost; 0.73 x as long as wide; transverse carina present only near the posterolateral corners; disc reticulate; basal triangular area weakly reticulate.

Gaster smooth and shining. Forewings with closed areola.

Holotype. Ikuta, Kawasaki-shi, Kanagawa Pref., 10.VI.1972, Y. Yoshikawa leg. [NIAES].

Paratypes. 1f, same locality as holotype, 7.VI.1972, Y. Yoshikawa leg. [TE]; 2f, Fukuoka-shi, Fukuoka Pref., 18.IV.1931, S. Hashimoto leg. [KUF]; 1f, Hirao, Fukuoka-shi, Fukuoka Pref., 5.V.1954 [KUF]; 1f, Hakozaiki, Fukuoka-shi, Fukuoka Pref., 26.V.1969, O. Yata leg. [KUF].

Distribution. Honshu, Kyushu.



Genus *Sierola* Cameron

*Sierola* Cameron, 1881. Trans. Ent. Soc. London, 1881, p. 556.

Japanese name: Yotsume-arigatabachi-zoku.

Diagnosis. Small wasps with the following combination of the characteristics.

1. PF = 5.3.
2. Anterior border of clypeus projecting.
3. Antennae with 13 segments.
4. Notauli absent.
5. Propodeal disc with lateral carinae.
6. Transverse carina present, incomplete, or absent.
7. Median carina absent.
8. Prostigma present.
9. Marginal cell closed.

This genus has been known only a single species, *S. sinensis* (Figs. 464, 465), from Asia. I examined 2 additional species from East Asia (Japan) and 2 undescribed species from Southeast Asia (Thailand). Japanese species are the first record from the Palaearctic region.

Key to the Japanese species of *Sierola*

1. Middle and hind tibiae blackish brown; antennal 2nd segment as long as wide  
..... *S. echigoana* sp. nov. [Hon]
- All tibiae yellow; antennal 2nd segment longer than wide.....  
..... *S. shimotsukeana* sp. nov. [Hon]

*Sierola echigoana* sp. nov.

(Figs. 466-468)

Japanese name: Echigo-yotsume-arigatabachi

Holotype. HL 0.40 mm; HW 0.33 mm; FW 0.18 mm; LA 0.63 mm; LP 0.25 mm; WPD 0.30 mm; FWL 1.15 mm; TL 1.5 mm.

Body black, with brownish tinge; mandibles black; antennae, fore tibiae and tarsi yellow; middle and hind tibiae blackish brown excluding anterior and posterior portion yellowish; middle and hind tarsi yellow.

Head 1.21 x as long as wide, with almost straight but weakly convex posterior border, microreticulate. First 4 antennal segments in a ratio of about 3:1.5:1.2:1 in length; scape 1.5 x as long as wide, 2nd and 3rd segments each as long as wide; 4th to 8th segments each wider than long; 9th to 13th segments each moniform. Eyes 0.18 mm in maximum diameter; EL 1.0 x FW. Ocellar triangle obtuse; POL:AOL = 2:1; OOL 1.7 x WOT.



Pronotum 0.30 mm in dorsal maximum width, microreticulate. mesonotum microreticulate. Propodeum 0.83 x as long as wide as seen from above; dorsal and declivous surfaces microreticulate.

Gaster smooth and shining.

Variation. A single paratype larger than the holotype as following measurements: HL 0.50 mm; HW 0.38 mm; LE 0.20 mm; FWL 1.38 mm; TL 1.8 mm.

Holotype. Female. Yamadera, Ojiya, Niigata Pref., 20.VIII.1970. K. Yamagishi leg. [NIAES].

Paratype. 1f, Kooridono, Ojiya, Niigata Pref., 23.VIII.1970. K. Yamagishi leg. [TE].

*Sierola shimotsukeana* sp. nov.

(Figs. 469-470)

Japanese name: Shimotsuke-yotume-arigatabachi.

Holotype. Female. HL 0.5 mm; HW 0.42 mm; WF 0.25 mm; LA 0.73 mm; LP 0.30 mm; WPD 0.33 mm; FWL 1.60 mm; TL 1.9 mm.

Body black, gaster with brownish tinge; mandibles black; antennae yellow; coxae, trochanters and femora brown; tibiae and tarsi yellow.

Head 1.21 x as long as wide, with very weakly convex posterior border in frontal view, microreticulate. First 4 segments of antennae in a ratio of about 4:2:1.2:1.3; scape 1.6 x as long as wide; 2nd segment longer than wide; 3rd and 4th segments each as long as wide; 6th to 13th segments each moniform.

Eyes 0.20 mm in maximum diameter; WF 1.25 x LE. Ocellor triangular obtuse; POL :AOL = 3:2; OOL 1.3 x WOT.

Pronotum 0.40 mm in maximum width, microreticulate. Mesonotum microreticulate. Propodeum 0.91 x as long as maximum width; disc and declivity surface microreticulate.

Gaster smooth and shining.

Holotype. Female. Shiobara, Hikinuma, Tochigi Pref., 2.X.1985. K. Takahashi leg. [CNC].