

Some Metopiinae of Taiwan (Hymenoptera : Ichneumonidae)

Kanetosi KUSIGEMATI*

Abstract

Twenty-one species and one subspecies of the subfamily Metopiinae belonging to seven genera are recorded from Taiwan. Of them eight species are described as new to science : — *Metopius* (*Tylopius*) *oharai*, *Hypsicera taiwana*, *H. oharai*, *H. obliqua*, *Exochus posticus*, *E. flavonotatus*, *E. perfectus* and *E. saigusai*. Three species are newly recorded from Taiwan : — *Chorinaeus aizanensis* Kusigemati, *Triclistus grobulipes* (Desvignes) and *Exochus ornatus* Momoi and Kusigemati.

In this report are treated some ichneumonflies of the subfamily Metopiinae collected by Dr. C. M. Yoshimoto, Dr. T. C. Maa, Dr. S. Miyamoto, Dr. T. Shirôzu, Dr. T. Saigusa, Mr. K. Ôhara and Mr. H. Takemoto in Taiwan. The writer is thankful to the above mentioned seven entomologists for their kindness in offering material for his study. The writer is also grateful to Dr. S. Momoi of the Kobe University for his kindness in giving me the opportunity to study invaluable specimens and critical advice. Grateful acknowledgement is made to Prof. A. Nagatomi of the Kagoshima University, for his constant encouragement and assistance.

1. *Acerataspis formosana* Cushman

Acerataspis formosana Cushman, 1937, Arb. über Morph. u. Taxonom. Ent. 4: 291.

Specimen examined: 1 ♂, Fenkihu, 1370 m, Chiayi Hsien, 10-12-iv-1965, C. M. Yoshimoto leg.

Distribution : Taiwan.

2. *Chorinaeus aizanensis* Kusigemati

Chorinaeus aizanensis Kusigemati, 1967, Ins. Mats. 30: 25.

*Entomological Laboratory, Faculty of Agriculture, Kagoshima University, Korimoto 1-21-24, Kagoshima, 890 Japan.

This species is new to Taiwan. The present specimen agrees well with the original description of *aizanensis*, but differs in having the following aspects:—

♀. Mandible more slender, 2.1 times as long as basal width; distance between lateral ocelli and eyes 1.1 times as long as diameter of an ocellus; antennae with 38 segments; 1st flagellar segment about 2.2 times as long as wide at apex and 1.3 times as long as the 2nd. Hind femur 3.2 times as long as wide in lateral view; basitarsus of middle leg 8/9 as long as the following segments together except claws. Abdomen with 2nd tergite 3/4 as long as wide at apex and 8/9 as long as the 3rd. Antennae a little darker; face yellow, with a small, central dark brown spot; clypeus yellow, broadly margined with dark brown along upper margin and with a broad dark brown stripe on centroventral area; abdominal tergite black.

Length: Body 7.1 mm., forewing ca. 5.8 mm.

Specimen examined: 1♀, Alishan, 2270 m, Chiayi Hsien, 8-9-iv-1965, in Malase trap, C. M. Yoshimoto leg.

Distribution: Taiwan and Japan.

3. *Metopius (Metopius) browni* Ashmead

Metopius browni Ashmead, 1905, Proc. U. S. Nat. Mus. 29: 117.

Specimens examined: 2♂♂ & 1♀, Hengchun, Pingtung Hsien, in drainage gutter, 4-iv-1965, in Malase trap, C. M. Yoshimoto leg.

Distribution: Taiwan, China, Japan, Hong Kong, Korea, Philippines, Mongolia and India.

4. *Metopius (Ceratopius) dissectorius taiwanensis* Chiu

Metopius (Ceratopius) dissectorius taiwanensis Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 11.

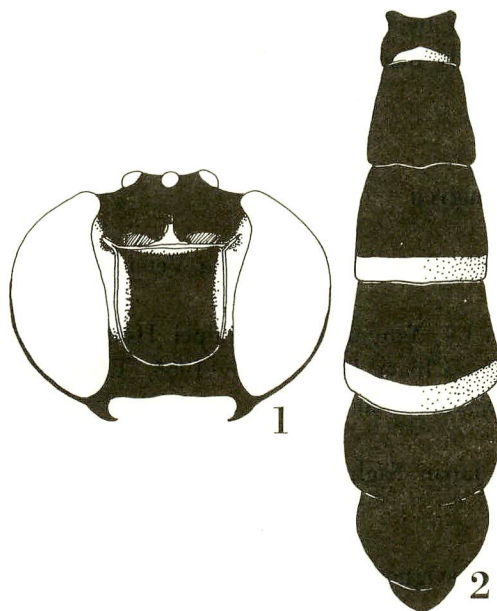
Specimen examined: 1♂, Fenchihu, Chiayi Hsien, 10-iv-1965, S. Miyamoto leg.

Distribution: Taiwan.

5. *Metopius (Tylopius) oharai*, sp. nov. (Figs. 1 & 2)

♀. Face with facial shield 8/9 as wide as high, the lower margin being broadly rounded medially; punctures of facial shield rather small, strong, of irregular size; malar space short, about 1/3 as long as basal width of mandible; mandible bidentate, the lower tooth being much shorter than the upper one; clypeus with a broad and weak

impression medially; 2nd segment of maxillary palpus swollen, $5/8$ as long as wide; frons sparsely and rather weakly punctate, the punctures being denser laterally; distance between lateral ocelli and eyes about 1.6 times as long as diameter of an ocellus; temple narrow, flat, finely and densely punctate; antennae with 61 segments; 1st flagellar segment about as long as wide at apex and 1.3 times as long as the 2nd. Mesoscutum with notauli weakly impressed, extending to center of mesoscutum; scutellum with coarse, very strong punctures, the lateral carina being weakly produced and almost truncate apically; mesopleurum and metapleurum with coarse, very strong punctures. Propodeum with median basal area with a longitudinal carina; areola separated from basal area by a distinct carina; costula present. Forewing with nervulus postfurcal by about $2/7$ of its own length; areolet rhomboidal, with a short stalk above, with 2nd recurrent vein emitted from basal $2/3$ of its length; 1st intercubitus about $2/3$ as long as 2nd intercubitus; metacarpella with 17 hamuli; nervellus bent above middle. Hind femur about 2.6 times as long as wide in lateral view. Abdomen with 1st tergite polished, and bare on anterodorsal surface, with several very large punctures on



Metopius (Tylopius) oharai, sp. nov., ♀

Fig. 1. Head in frontal view;

Fig. 2. Colour pattern of abdomen.

laterocentral and postcentral areas; median longitudinal carinae of 1st tergite strong on basal half, indistinct on apical half; 2nd tergite approximately as long as wide at apex and $7/8$ as long as the 3rd, very strongly and coarsely punctate; 3rd tergite less strongly punctate than in 2nd tergite, $6/7$ as long as wide at apex; 6th tergite about $5/6$ as long as wide at base.

Black. Facial orbit, lower half of frontal orbit, lateral margin of facial shield, upper margin of facial shield on median $2/3$ and interantennal process yellow (Fig. 1). Antennae black; scape with a small yellow spot apicoventrally. Legs black; front femur

dark brown at apex, with a small yellow spot on subapical inner side. Abdomen (Fig. 2) black; 1st tergite with a subapical yellow band, the band not attained lateral margin and interrupted by median longitudinal carinae; 2nd, 5th and the following tergites entirely black; 3rd tergite black on basal 3/5, yellow on apical 2/5; 4th tergite black on basal 5/7, yellow on apical 2/7. Wings strongly tinged with dark brown, a little darker anteriorly.

Length: Body 13.3 mm., forewing 10.7 mm.

♂. Unknown.

Holotype (♀): Nanshanchi, 650-700 m, Nantou Hsien, 22-iv-1981, K. Ôhara leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species is closely related to *M. fuscolatus* Chiu, 1962, from Taiwan, but is at once distinguishable from the latter by the wide 6th abdominal tergite, by the stout hind femur and by the colouration of head, pronotum, mesopleurum and abdominal tergites. Furthermore, it is similar to the Japanese species, *M. arakawai* Uchida, 1930, but it differs from the latter by the black and very strongly punctate scutellum, by the black legs, by the entirely black 2nd tergite and by the 3rd tergite with a apical yellow band.

6. *Triclistus pallipes* Holmgren

Triclistus pallipes Holmgren, 1873, Öfvers. Svenska Vetensk. Akad. Forh. 40: 59.

Specimens examined: 1♀, Yangmingshan, Taipei Hsien, 28-iii-1965, Y. Hirashima leg.; 1♂, Fenchihu, 1400 m, Chiayi Hsien, 12-iv-1965, T. Saigusa leg.; 1♀, Sungkang, Nantou Hsien, 29-vi-1965, T. Shirôzu leg.

Distribution: Taiwan, Japan, Saghalien, Kuriles, Russia, Europe and North America.

7. *Triclistus globulipes* (Desvignes)

Triclistus globulipes Desvignes, 1856, Catal. Brit. Ichneumon 1856: 45.

This species is new to Taiwan. The present material agrees well with Morley's (1911) and Kusigemati's (1971) redescrptions of the species based on European and Japanese material, respectively. The hind femur is 2.4-2.6 times as long as wide in lateral view, while in the Japanese form hind femur is 2.2-2.4 times as long as wide in lateral view. The antennae and hind femur are darker than in the Japanese form.

Specimens examined: 2♂♂, Wulai, Kueishan, 300-500 m, 11-xi-1957, T. C. Maa leg.; 1♂, Wulai, nr. Taipei, 300-500 m, 12-iv-1960, T. C. Maa leg.

Distribution: Taiwan, Japan and Europe.

8. *Triclistus dimidiatus* Morley

Triclistus dimidiatus Morley, 1913, Fauna of British India ... Hymenoptera 3: 301.

Specimens examined: 1 ♀, Taipei & environs. 10-50 m, 10-15-ix-1957, T. C. Maa leg.; 1 ♂, Fenchihu, Chiayi Hsien, 10-iv-1965, S. Miyamoto leg.; 1 ♀, Kuantzuling, Tainan Hsien, 7-iv-1965, Y. Hirashima leg.; 1 ♂, 17-24 km SE of Taipei, Taipei Hsien, 15-iv-1965, Y. Hirashima leg.; 1 ♀, Fenchihu, Chiayi Hsien, 1370 m, 10-12-iv-1965, C. M. Yoshimoto & B. D. Perkins leg.; 2 ♂♂, Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, K. Ôhara leg.

Distribution: Taiwan, Burma, Philippines, Thailand and Japan.

9. *Drepanoctonus auritus* Chiu

Drepanoctonus auritus Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 23.

Specimen examined: 1 ♀, Fenchihu, 1370 m, Chiayi Hsien, 10-12-iv-1965, C. M. Yoshimoto & B. D. Perkins leg.

Distribution: Taiwan.

10. *Hypsicera seta* Chiu

Hypsicera seta Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 26.

Specimens examined: 1 ♂, Nanshanchi, 650-700 m, Nantou Hsien, 23-iv-1981, K. Ôhara leg.; 1 ♂, Nanshanchi, 650-700 m, Nantou Hsien, H. Takemoto leg.; 3 ♂♂, Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, K. Ôhara leg.

Distribution: Taiwan.

11. *Hypsicera lita* Chiu

Hypsicera lita Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 26.

Specimens examined: 2 ♂♂, Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, K. Ôhara leg.

Distribution: Taiwan.

12. *Hypsicera erythropus* (Cameron)

Hypsicera erythropus Cameron, 1902, Jour. Bombay Nat. Hist. Soc. 14: 432.

Specimen examined: 1 ♂, Nanshanchi, 650-700 m, Nantou Hsien, 23-iv-1981, H. Takemoto leg.

Distribution: Taiwan and India.

13. *Hypsicera affinis* Chiu

Hypsicera affinis Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 30.

The male of this species has not yet been described. On the basis of the present specimen a description of the male may be given below:—

♂. Face and clypeus combined $\frac{5}{6}$ as wide as high; face finely and moderately densely punctate, with very fine, transverse striae; clypeus polished, with several setiferous punctures, the apical margin being very weakly concave medially; malar space 1.1 times as long as basal width of mandible; mandible narrow, strongly tapering towards apex, unidentate; distance between lateral ocelli and eyes $\frac{5}{8}$ as long as diameter of an ocellus; temple narrow, weakly swollen, with short and dense hairs; occipital carina absent; frons rather flat, polished, rather densely and strongly punctate, with a weak V-shaped prominence just below anterior ocellus; antennae long, filiform, with 33 segments; 1st flagellar segment slender, about 3.5 times as long as wide at apex and about 1.8 times as long as the 2nd. Mesoscutum with notauli weakly impressed, reaching near center of mesoscutum; scutellum weakly convex, polished, with sparse hairs; metapleurum weakly convex, almost bare, with a few hairs on posterodorsal area. Propodeum strongly areolated; median longitudinal carinae almost parallel-sided; areola confluent with basal area; 2nd lateral area about 1.6 times as long as wide, with about 20 hairs wholly; propodeal spiracle elliptic. Forewing with nervellus postfurcal by $\frac{2}{3}$ of its own length; stigma about 3.3 times as long as wide, with radius emitted from basal $\frac{3}{5}$ of its length; nervellus weakly inclivous. Front and middle tarsal claws weakly pectinate basally; hind femur about 2.5 times as long as wide in lateral view. Abdomen with 1st tergite slender, about 1.7 times as long as wide at apex, rather sparsely hairy apicolaterally, bare on basal $\frac{1}{4}$ and median $\frac{1}{3}$, with median longitudinal carinae on basal $\frac{2}{3}$; 2nd tergite $\frac{7}{9}$ as long as wide at apex, with sublateral longitudinal carinae sharp throughout.

Black. Palpi pale yellow; mandible dark brown; upper part of face yellowish brown; antennae yellowish brown to infusate, darker apically. Humeral angle of pronotum and subtegular ridge tinged with yellowish brown; tegula yellowish brown. Legs pale yellow to yellowish brown; hind tibia with a distinct blackish basal band.

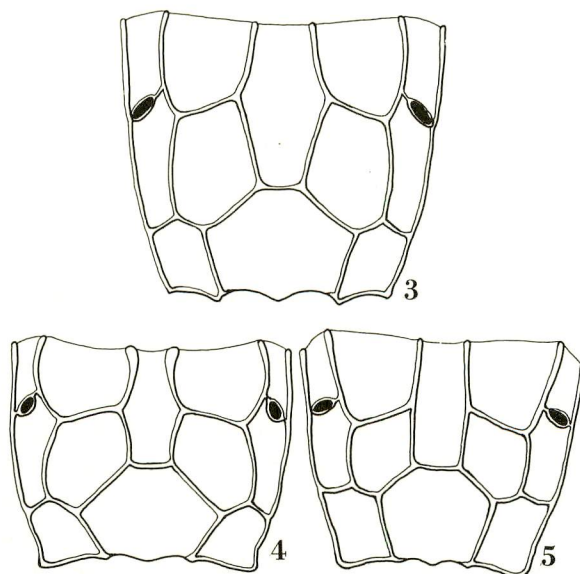
Length: Body ca. 4.2 mm., forewing 3.1 mm.

Specimen examined: 1 ♂, Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, H. Takemoto leg.

Distribution : Taiwan.

14. *Hypsicera oharai*, sp. nov. (Fig. 3)

♀. Face and clypeus combined $7/9$ as wide as high; face weakly and moderately densely punctate, with very fine, transverse striae, the striae being weaker ventrally; clypeus polished, with a few distinct setiferous punctures, the apical margin being more or less impressed and weakly concave medially; malar space about 1.3 times as long as basal width of mandible; mandible very narrow, strongly tapering towards apex, bidentate; distance between lateral ocelli and eyes $1/2$ as long as diameter of an ocellus; temple very narrow, weakly swollen and densely hairy; occipital carina very weak dorsally, absent laterally and below; frons rather flat, moderately densely and finely punctate, with a V-shaped prominence just below anterior ocellus; antennae long, filiform, with 39 segments; 1st flagellar segment 2.0 times as long as wide at apex and about 1.6 times as long as the 2nd. Mesoscutum with notauli distinct, reaching near center of mesoscutum; scutellum weakly convex, rather densely hairy; metapleurum weakly convex, with sparse hairs on dorsal margin and posterior part. Propodeum (Fig. 3) strongly areolated; areola confluent with basal area; 2nd lateral area about 1.4 times as long as wide, with about 20 hairs; propodeal spiracle elliptic. Forewing with nervellus postfurcal by about $4/7$ of its own length; stigma rather narrow, about 2.8 times as long as wide, with radius emitted from basal $5/9$ of its length; nervellus weakly inclivous. Front and middle tarsal claws strongly pectinate; hind femur rather slender, about 2.8 times as long as wide in lateral view. Abdomen with 1st tergite about 1.5 times as long as wide at apex, rather sparsely hairy apicolaterally, bare on basal $4/9$ and about median



Figs. 3-5. Areolation of propodeum: 3. *Hypsicera oharai*, sp. nov., ♀; 4. *H. obliqua*, sp. nov., ♂; 5. *H. taiwana*, sp. nov., ♀.

1/3, with median longitudinal carinae on basal 5/7; 2nd tergite 7/9 as long as wide at apex, rather densely punctate, impunctate apicolaterally, with sublateral longitudinal carinae sharp throughout.

Black. Palpi yellowish brown; mandible blackish; interantennal process and upper median part of face tinged with yellowish brown; antennae infusate, a little paler basally; tegula yellowish brown; humeral angle of pronotum tinged with yellowish brown. Legs yellowish brown; hind tibia without distinct dark brown band.

Length: Body 5.4 mm., forewing 4.1 mm.

♂. Face and clypeus combined 5/7 as wide as high; face finely and rather densely punctate, with very fine, transverse striae on upper part; malar space a little shorter than basal width of mandible; distance between lateral ocelli and eyes 7/8 as long as diameter of an ocellus; occipital carina obsolete dorsally; antennae with 37 segments. 1st flagellar segment about 3.0 times as long as wide at apex and about 1.4 times as long as the 2nd. Propodeum with 2nd lateral area with 13-17 hairs. Front and middle tarsal claws more weakly pectinate than in female. Apex of penis without setae. Antennae a little paler than in female; hind tibia with a distinct, blackish basal band.

Length: Body 5.4 mm., forewing ca. 3.7 mm.

Holotype (♀): Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, K. Ôhara leg. Paratype: 1♂, Jihyetan, 750 m, Nantou Hsien, 27-iv-1981, H. Takemoto leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species is very closely related to *H. affinis* Chiu, 1962, from Taiwan, but it differs from the latter by the distinct occipital carina, by the more slender 1st and 2nd abdominal tergites and by the metapleurum with hairs. Furthermore, it resembles the Japanese species, *H. rugosa* Kusigemati, 1971, but is easily separated by the presence of the occipital carina, by the absence of the basal band of the hind tibia in the female and by the sparsely hairy 2nd lateral area of propodeum.

15. *Hypsicera taiwana*, sp. nov. (Fig. 5)

♀. Face and clypeus combined about 4/5 as wide as high; face rather strongly rugosopunctate on dorsal half, moderately strongly punctate on ventral half, the punctures becoming sparser below; clypeus polished, with strong, sparse punctures, the apical margin being more or less impressed and weakly concave medially; malar space about 1.7 times as long as basal width of mandible; mandible very narrow, strongly tapering towards apex, bidentate; distance between lateral ocelli and eyes 7/8 as long as diameter of an ocellus; temple very narrow, weakly swollen, densely hairy; occipital carina weak but distinct, absent dorsally; frons rather flat, densely and weakly punctate, with a weak V-shaped prominence just below anterior ocellus; antennae long, filiform, with 42 segments; 1st flagellar segment about 2.9 times as long as wide at apex and 2.0 times as long as the 2nd. Mesoscutum with notauli shortly impressed, reaching near center of mesoscutum; scutellum weakly convex and densely hairy as in *oharai*; metapleurum weakly convex, polished, with a row of hairs along upper dorsal margin. Propodeum (Fig. 5) strongly areolated; areola confluent with basal area; 2nd lateral area about 1.3

times as long as wide, with 3 or 4 hairs on apicolateral corner; propodeal spiracle elliptic. Forewing with nervulus postfurcal by about $1/2$ of its own length; stigma narrow, about 3.4 times as long as wide, with radius emitted from basal $3/5$ of its length; nervellus subvertical. Front and middle tarsal claws less strongly pectinate than in *oharai*; hind femur 2.8 times as long as wide in lateral view. Abdomen with 1st tergite about 1.3 times as long as wide at apex, rather sparsely hairy on apicolateral $3/5$, bare on basal $2/5$ and about median $1/3$, with median longitudinal carinae on basal $2/3$; 2nd tergite $5/7$ as long as wide at apex, rather densely punctate, with a large impunctate part on central area, with sublateral longitudinal carinae sharp throughout.

Black. Palpi pale yellow to yellowish brown; mandible dark brown, paler apically; antennae yellowish brown to infusate, paler basally; upper part of face tinged with yellowish brown; humeral angle of pronotum yellowish brown; tegula pale yellow. Legs yellowish brown; hind tibia with a distinct blackish basal band.

Length: Body 4.8 mm., forewing ca. 3.6 mm.

♂. Unknown.

Holotype (♀): Lienhuachih, 500–550m, Nantou Hsien, 28-iv-1981, K. Ôhara leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species is very closely allied to the preceding species, *H. oharai*, sp. nov., from which it is easily separated by the hind tibia with a distinct blackish basal band, by the weakly pectinate front and middle tarsal claws, by the densely and strongly punctate frons and by the absence of occipital carina dorsally.

16. *Hypsicera obliqua*, sp. nov. (Fig. 4)

♂. Face and clypeus combined about $7/9$ as wide as high; face densely and shallowly punctate, with fine transverse striae on upper central part; clypeus polished, densely punctate as in face, with apical edge being margined with a weak carina, and slightly concave medially; malar space short, about as long as basal width of mandible; mandible narrow; strongly tapering towards apex, bidentate, the lower tooth being very short; distance between lateral ocelli and eyes about $5/7$ as long as diameter of an ocellus; temple very narrow, almost flat, with short and dense hairs; occipital carina absent; frons weakly convex, moderately densely punctate, with a V-shaped prominence just below anterior ocellus and with a small impunctate area on antennal scrobe; antennae filiform, with 43 segments; 1st flagellar segment 2.3 times as long as wide at apex and about 1.5 times as long as the 2nd. Mesoscutum with notauli shortly impressed, reaching about basal $2/7$ of mesoscutum; scutellum weakly convex, with dense setiferous punctures; metapleurum polished, weakly convex, with a wide hair band along dorsal margin. Propodeum (Fig. 4) strongly areolated; areola confluent with basal area, with 11 hairs; 2nd lateral area wide, about 1.2 times as long as wide, wholly covered with rather dense hairs; propodeal spiracle elongate. Forewing with nervulus postfurcal by $4/9$ of its own length; stigma about 3.4 times as long as wide, with radius emitted from basal $3/5$ of its length; nervellus strongly inclivous. Front and middle tarsal claws

moderately pectinate; hind femur about 2.7 times as long as wide in lateral view. Abdomen with 1st tergite about 1.4 times as long as wide at apex, moderately densely hairy, the hairs becoming sparser medially, and absent basomedially, with median longitudinal carinae on about basal 5/7; 2nd tergite about 5/7 as long as wide at apex, densely punctate, with sublateral longitudinal carinae sharp rather than obtuse throughout; apex of penis without setae.

Black. Palpi pale yellow; mandible dark brown; antennae dark brown, paler basally; upper margin of face and humeral angle of pronotum weakly tinged with dark brown; tegula yellowish to dark brown. Legs yellowish brown to dark brown; coxae and femora darker; hind tarsus light infuscate; hind tibia with a distinct blackish basal band.

Length: Body 6.4 mm., forewing 5.0 mm.

♀. Unknown.

Holotype (♀): Lienhuachih, 500-550 m, Nantou Hsien, 28-iv-1981, K. Ôhara leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species is closely related to the Japanese species, *H. harrelli* Momoi and Kusigemati, 1970, from which it is readily distinguished by the areola with hairs, by the densely hairy 2nd lateral area of propodeum, by the metapleurum with a dorsal wide hair band, by the short malar space and by the strongly inclivous nervellus.

17. *Exochus stenus* Chiu

Exochus stenus Chiu, 1962, Bull. Taiwan Agr. Res. Inst. 20: 34.

Specimen examined: 1♀, Hsintien 100 m, Taipei Hsien, 29-ix-1957, T. C. Maa leg.

Distribution: Taiwan. Chiu,

18. *Exochus posticus*, sp. nov. (Figs. 7 & 12)

♀. Face as wide as high, finely and sparsely punctate; clypeus very sparsely punctate, the apical edge being margined with a weak carina, and slightly concave medially; malar space as long as basal width of mandible; temple rather flat, with very sparse, short hairs; distance between lateral ocelli and eyes about as long as diameter of an ocellus; occipital carina very weak, absent dorsally and below; frons with V-shaped prominence; yellow spots at top of eyes large, touching margin of eye and fused with yellow frontal orbit; antennae with 29 segments; 1st flagellar segment 2.6 times as long as wide at apex and 2.4 times as long as the 2nd. Mesoscutum with notauli very short but strong; mesopleurum very sparsely hairy, the hairs being sparser centrally, and bare posteriorly; metapleurum polished and bare; scutellum weakly convex. Propodeum (Fig. 7) with costula present; areola confluent with median basal area; median longitudinal carinae distinct on basal area, obsolete on areola, and absent on apical area; apical transverse carinae distinct on pleural area and present as short stubs on

lateral area; median basal area, areola, 2nd lateral area and petiolar area polished and bare except for very sparsely hairy lateral margin of 2nd lateral area; 1st lateral area regularly spaced hairy wholly; propodeal spiracle long-ovate. Forewing with nervellus postfurcal by about $4/7$ of its own length; portion of cubitus between intercubitus and 2nd recurrent vein about $8/9$ as long as intercubitus. Hind femur about 2.4 times as long as wide in lateral view; front spur of middle tibia $3/4$ as long as hind spur of middle tibia. Abdomen with 1st tergite 1.5 times as long as wide at apex, about 1.4 times as long as the 2nd, with median longitudinal carinae on basal $4/9$; 2nd tergite $6/7$ as long as wide at apex; epipleurum of 3rd tergite narrowly wedge-shaped, the inner edge being weakly concave on basal half.

Black. Face yellow, with a dark brown transverse band ventrally; clypeus yellow, with a brownish spot apicocentrally; malar space yellow; frons laterally yellow, the yellow area continuous to yellow top of eye; tempolar orbit yellow, the yellow area not continuous to top of eye; lower part of temple, mouth parts, upper dorsal margin of pronotum, tegula and subtegular ridge pale yellow to yellowish brown. Antennae infusate. Scutellum except for blackish brown basocentral area and postscutellum yellowish brown. Front and middle legs yellowish brown; apex of coxae and femora pale yellow. Hind leg (Fig. 12) with coxa blackish brown, paler apically; 1st trochanter dark brown; 2nd trochanter pale yellow; femur dark brown basally and pale yellow apically; tibia light yellowish brown, a little darker apically; tarsus light yellowish brown. Apex of each tergite weakly tinged with yellowish brown.

Length: Body 5.0 mm., forewing 4.0 mm.

♂. Unknown.

Holotype (♀): Meifeng-Tsuifeng, 2200-2300 m, Nantou Hsien, 25-iv-1981, K. Ôhara leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species is very closely related to the Japanese species, *E. rufigaster* Kusigemati, 1971, but it is readily distinguished from the latter by the short antennae with 29 segments; by the more slender 1st and 2nd flagellar segments, by the yellow face, by the entirely black mesopleurum and by the coloration of abdominal tergite. This species belongs to the *pictus* group of Townes and Townes (1959).

19. *Exochus flavonotatus*, sp. nov. (Figs. 6 & 13)

♂. Face about 1.2 times as wide as high, strongly and rather densely punctate; clypeus strongly and more sparsely punctate than in face, the apical margin being almost truncate medially; malar space $7/8$ as long as basal width of mandible; mandible rather narrow, moderately tapering towards apex, weakly swollen on surface, the lower tooth being very short; temple weakly swollen, covered with short, rather dense hairs; occipital carina entirely absent; yellow spots at top of eyes triangular, touching margin of eye and not continuous to yellow frontal orbit; distance between lateral ocelli and eyes $6/7$ as long as diameter of an ocellus; antennae with 34 segments; 1st flagellar segment 2.6 times as long as wide at apex and 1.6 times as long as the 2nd. Mesoscutum with notauli shortly and distinctly impressed; scutellum rather flat, with long and sparse

hairs; metapleurum bare, with a few hairs on posterior corner. Propodeum (Fig. 6) strongly areolated; costula strong; areola confluent with median basal area; median longitudinal carinae curved at costula; 2nd lateral area with about 10 hairs on apico-lateral corner; propodeal spiracle long-ovate. Forewing with nervulus postfurcal by about $2/3$ of its own length; portion of cubitus between intercubitus and 2nd recurrent vein about 2.3 times as long as intercubitus. Leg with hind femur 2.6 times as long as wide in lateral views; front spur of middle tibia $5/9$ as long as hind spur of middle tibia. Abdomen with 1st tergite about 1.1 times as long as wide at apex, about 1.4 times as long as the 2nd and with median longitudinal carinae on about basal $1/2$; 2nd tergite about $2/3$ as long as wide at apex; epipleurum of 3rd tergite narrowly wedge-shaped, the inner margin being slightly concave.

Black. Face, clypeus, malar space, lower $1/3$ of temple, lower $2/3$ of frontal orbit and spots at top of eyes yellow; palpi, mandible except for brown apical teeth, upper dorsal margin of pronotum, tegula, scutellum and postscutellum yellow; mesopleurum black, with a large, yellow spot, the spot being interrupted by prepectal carina; subtegular ridge weakly tinged with yellowish brown; antennae infusate; scape infusate dorsally, yellowish brown ventrally. Front and middle legs entirely pale yellow. Hind leg (Fig. 12) with coxa blackish; trochanter except for each yellowish brown apex, dark brown; femur pale yellow; tibia pale yellow, with a blackish basal band; tarsus light yellowish brown.

Length: Body 6.0 mm., forewing 4.7 mm.

♀. Unknown.

Holotype (♂): Chiaoliping, Chiayi Hsien, 13-iv-1965, T. Saigusa leg. The type is preserved in the collection of the Entomological Laboratory, Kyushu University.

This species belongs to the *pulatus* group of Townes and Townes (1959). In general appearance it is very similar to *E. prosopius* Gravenhorst, 1829, but differs from the latter in having a yellow scutellum and postscutellum, the mesopleurum with a large yellow spot and yellow frontal orbit.

20. *Exochus ornatus* Momoi and Kusigemati

Exochus ornatus Momoi and Kusigemati, 1970, Pacific Insects 12: 413.

This species is new to Taiwan. The present specimen agrees well enough with the original description of *ornatus*, but differs in having the following aspects: —

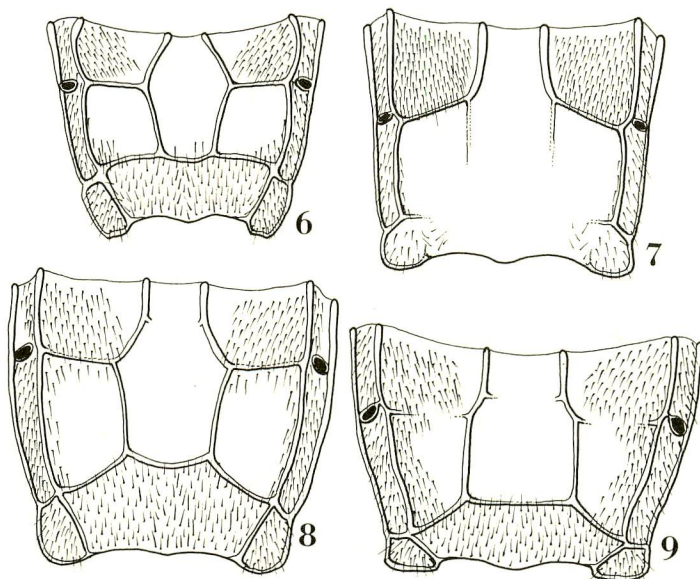
♀. Malar space $7/9$ as long as basal width of mandible; distance between lateral ocelli and eyes $5/6$ as long as diameter of an ocellus; 1st abdominal tergite 1.5 times as long as wide at apex; dark brown lower area of face a little paler than in the Japanese form; propleurum entirely tinged with dark brown; prepectus and central part of mesopleurum weakly tinged with dirty yellowish brown. Forewing about 4.1 mm. in length.

Specimen examined: 1 ♀, Histsun-Chihtuan, 1000–1200 m, Taoyuan Hsien, 18-iv-1981, H. Takemoto leg.

Distribution: Taiwan and Japan.

21. *Exochus perfectus*, sp. nov. (Figs. 8 & 11)

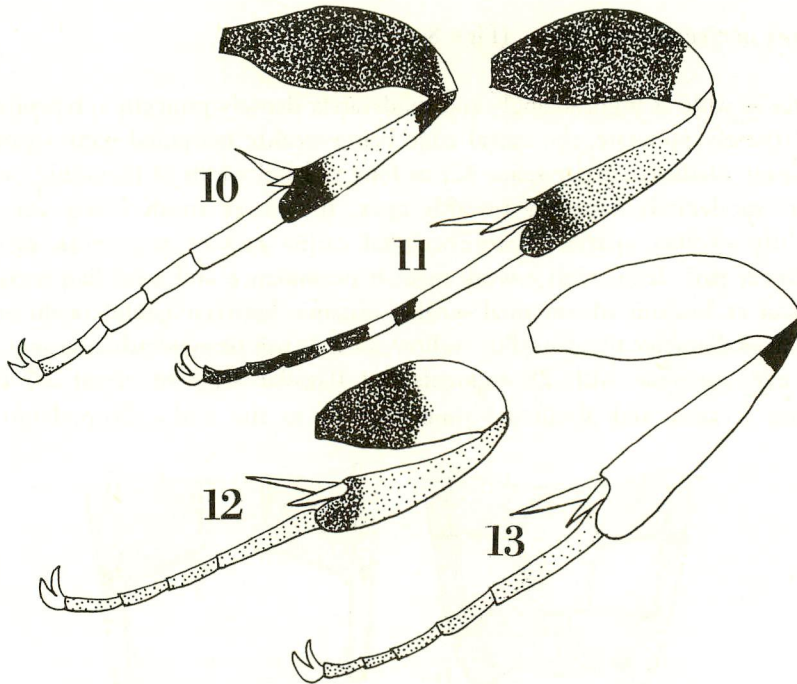
♀. Face as wide as high, strongly and moderately densely punctate; clypeus strongly and rather sparsely punctate, the apical edge being weakly margined with a carina and slightly concave medially; malar space $5/7$ as long as basal width of mandible; mandible rather wide, moderately tapering towards apex, the lower tooth being very short; temple slightly swollen, sparsely hairy; occipital carina present as a weak carina and absent on lower part; frons with a weak median prominence and a median weak longitudinal carina at bottom of antennal scrobe; distance between lateral ocelli and eyes about as long as diameter of an ocellus; yellow spots at top of eyes rather large, touching margin of eye; antennae with 28 segments; 1st flagellar segment about 2.7 times as long as wide at apex and about 1.5 times as long as the 2nd. Propodeum (Fig. 8)



Figs. 6-9. Areolation and hair arrangement of propodeum: 6. *Exochus flavonotatus*, sp. nov., ♂; 7. *E. posticus*, sp. nov., ♀; 8. *E. perfectus*, sp. nov., ♀; 9. *E. saigusai*, sp. nov., ♂.

weakly areolated; areola confluent with median basal area; median longitudinal carinae strongly curved at costula; costula very weak but distinct; 2nd lateral area sparsely hairy on anterior and outer lateral parts, and bare on inner lateral and posterior parts; propodeal spiracle elliptic. Forewing with nervulus postfurcal by $3/7$ of its own length; portion of cubitus between intercubitus and 2nd recurrent vein about 1.2 times as long as intercubitus. Leg with hind femur about 2.6 times as long as wide in lateral view; front spur of middle tibia $4/7$ as long as hind spur of middle tibia. Abdomen with 1st tergite about 1.2 times as long as wide at apex, about 1.2 times as long as the 2nd, and with median longitudinal carinae on about basal $1/2$; 2nd tergite

about $3/4$ as long as wide at apex; epipleurum of 3rd tergite semicircular, large, subtruncate apically, the inner margin being evenly and weakly arcuate.



Figs. 10-13. Colour pattern of left hind leg: 10. *Exochus saigusai*, sp. nov., ♂; 11. *E. perfectus*, sp. nov., ♀; 12. *E. posticus*, sp. nov., ♀; 13. *E. flavonotatus*, sp. nov., ♂.

Black. Face, clypeus, malar space, mouth parts, humeral angle of pronotum, tegula and subtegular ridge pale yellow to yellow; antennae blackish; scape black with a ventral yellow spot. Front and middle legs pale yellow to yellowish brown; middle coxa dark brown basally; femora reddish brown, pale yellow at apex; middle tibia light dark brown, with a basal pale yellow band. Hind leg with coxa black; 1st trochanter yellowish brown, blackish brown basodorsally; 2nd trochanter and femur light reddish brown, the apical part of femur being pale yellow (Fig. 11); tibia pale yellow on basal $1/4$, light yellowish brown on median $3/7$ and infusate on apical $1/3$ (Fig. 11); tarsus except for pale yellow basal $1/2$ of basitarsus and $1/2$ of 2nd segment, infusate (Fig. 11).

Length: Body ca. 5.4 mm., forewing 4.2 mm.

♂. Unknown.

Holotype (♀): Meifeng-Tsuifeng, 2200-2300 m, Nantou Hsien, 25-iv-1981, K. Ôhara leg. The type is preserved in the collection of the Entomological Laboratory, Kagoshima University.

This species belongs to the *tibialis* group of Townes and Townes (1959). It is easily distinguished from any other species of the group by the presence of occipital carina except for lower part.

22. *Exochus saigusai*, sp. nov. (Figs. 9 & 10)

♂. Face about 1.1 times as wide as high, strongly and rather densely punctate; clypeus strongly and more sparsely punctate than in face, the apical margin being very weakly concave medially; malar space $2/3$ - $3/4$ as long as basal width of mandible; mandible moderately wide, moderately tapering towards apex, the lower tooth being very short; temple slightly swollen, with regularly spaced and dense hairs; occipital carina present laterally, absent dorsally and below; yellow spots at top of eyes subtriangular, touching margin of eye; distance between lateral ocelli and eyes about as long as diameter of an ocellus; frons with a weak V-shaped prominence just below anterior ocellus and with a median weak longitudinal carina at bottom of antennal scrobe; antennae with 25-27 segments; 1st flagellar segment 2.7-3.0 times as long as wide at apex and about 1.4 times as long as the 2nd. Mesoscutum with notauli rather wide, short, distinctly impressed; scutellum rather slightly convex, with long sparse hairs; metapleurum smooth, with a few hairs on posterior corner. Propodeum (Fig. 9) weakly to strongly areolated; costula almost absent, but present as short stubs on median and lateral longitudinal carinae, sometimes complete and strong; areola incompletely confluent with median basal area; median longitudinal carinae weakly curved at costula; 2nd lateral area sparsely hairy, bare on inner lateral margin; propodeal spiracle elliptic. Forewing with nervulus postfurcal by about $1/2$ of its own length; portion of cubitus between intercubitus and 2nd recurrent vein 1.3 times as long as intercubitus. Hind femur 2.5 times as long as wide in lateral view; front spur of middle tibia $2/5$ as long as hind spur of middle tibia. Abdomen with 1st tergite about 1.1 times as long as wide at apex, about as long as the 2nd and with median longitudinal carinae on about basal $1/2$; 2nd tergite about $4/5$ as long as wide at apex; epipleurum of 3rd tergite large, semicircular, subtruncate apically, the inner margin being evenly and weakly arcuate.

Black. Face yellow, with a longitudinal dark brown spot dorsocentrally; clypeus yellow, with a dark brown spot apicocentrally; face and clypeus sometimes entirely yellow; mouth parts, malar space, lower part of temple and frontal orbit yellow; upper dorsal margin of pronotum, sometimes humeral angle of pronotum, tegula and subtegular ridge yellow to light yellowish brown; scutellum blackish, yellowish on lateral and apical margins; postscutellum more or less tinged with dark brown; antennae infusate, a little darker dorsally. Legs pale yellow to yellowish brown; basal half of front and middle coxae and femora (Fig. 10) except for apicodorsal part, light reddish brown; hind tibia (Fig. 10) pale yellow, infusate on about apical $3/8$ and with a infusate basal band.

Length: Body 5.0-6.0 mm., forewing 4.0-4.8 mm.

♀. Unknown.

Holotype (♂): Fenchihu, 1400 m, Chiayi Hsien, 12-iv-1965, T. Saigusa leg. Paratype; 1♂, Chito, Exp. For., 1150 m, 12-15-x-1957, T. C. Maa leg. The type is preserved in the collection of the Entomological Laboratory, Kyushu University.

This species belongs to the *tibialis* group of Townes and Townes (1959). It is very closely related to the Japanese species, *E. erythropus* Kusigemati, 1971, from which it differs by the slender hind femur, by the yellow face, clypeus, and malar space. Furthermore,

it is also allied to *E. scutellaris* Chiu, 1962, from Taiwan, from which it is easily distinguishable by the yellow face, by the black mesopleurum and by the entirely pale yellow hind tarsi.

References

- 1) Chiu, S.-C.: The Taiwan Metopiinae (Hymenoptera: Ichneumonidae). Bull. Taiwan Agr. Res. Inst. 20: 1-37 (1962).
- 2) Cushman, R. A.: H. Sauter's Formosan collection: Ichneumonidae. Ard. Morph. Taxon. Ent. Berlin-Dahlem 4: 283-311 (1937).
- 3) Kusigemati, K.: On the Japanese species of the genus *Chorinaeus* Holmgren, with description of five new species (Hymenoptera: Ichneumonidae). Ins. Mats. 30: 17-27 (1967).
- 4) Kusigemati, K.: Taxonomic studies on the subfamily Metopiinae of Japan (Hymenoptera: Ichneumonidae). Mem. Fac. Agr. Kagoshima Univ. 8: 205-298 (1971).
- 5) Momoi, S. and K. Kusigemati: Metopiinae (Hymenoptera: Ichneumonidae) of the Ryukyu Archipelago. Pacific Insects 12: 401-415 (1970).
- 6) Morley, Cl.: The ichneumons of Great Britain; Tryphoninae. Ichneumonologia Britannica, IV, 344 pp. (1911).
- 7) Morley, Cl.: The fauna of British India, including Ceylon and Burma. Hymenoptera 3. Ichneumonidae, 532 pp. (1913).
- 8) Townes, H.: The genera of Ichneumonidae, part 4. Mem. Amer. Ent. Inst. 17, 372 pp. (1971).
- 9) Townes, H. and M. Townes: Ichneumon-flies of America North of Mexico: 1. Subfamily Metopiinae. U. S. Nat. Mus. Bull. 216, 318 pp. (1959).
- 10) Townes, H., M. Townes and V. K. Gupta: A Catalogue and reclassification of the Indo-Australian Ichneumonidae. Mem. Amer. Ent. Inst. 1, 522 pp. (1961).
- 11) Townes, H., M. Townes and S. Momoi: A catalogue and reclassification of the Eastern Palearctic Ichneumonidae. Mem. Amer. Ent. Inst. 5, 661 pp. (1965).
- 12) Uchida, T.: Vierter Beitrag zur Ichneumoniden-Fauna Japans (Tryphoninae). Jour. Fac. Agr. Hokkaido Imp. Univ. 25: 243-298 (1930).
- 13) Uchida, T.: H. Sauter's Formosa-Ausbeute. Jour. Fac. Agr. Hokkaido Imp. Univ. 33: 133-222 (1932).
- 14) Uchida, T.: Ichneumoniden Mandschukuos aus dem entomologischen Museum der kaiserlichen Hokkaido Universitaet. Ins. Mats. 16: 107-146 (1942).
- 15) Uchida, T.: Ichneumonologische Ergebnisse der japanischen wissenschaftlichen Schansi-Provinz, China-Expedition im Jahre 1942. Mushi 24: 39-58 (1952).