

Mesochorinae of Formosa (Hymenoptera : Ichneumonidae)

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Abstract

Eighteen species of the subfamily Mesochorinae belonging to three genera are recorded from Formosa. Of those, *Stictopisthus takemotoi*, *Astiphromma confusum*, *A. ohharai*, *Mesochorus jihyetanus*, *M. rubranotatus*, *M. hashimotoi* (which also occurs in Japan), *M. taiwanensis*, *M. dentus*, *M. takizawai* (which also occurs in Japan), *M. microbothros*, *M. stigmatus*, *M. interstitialis*, *M. monomaculatus*, *M. turgidus*, *M. atricoxalis*, and *M. instriatus* are described as new, and *M. castaneus* Uchida is recorded from Formosa for the first time.

Introduction

This paper is a report Formosan ichneumonflies of the subfamily Mesochorinae based on material collected from Formosa by K. Ôhara (1981 & 1984), H. Takemoto (1981), and T. Gotô (1984).

Insofar as I am aware, only one species of the subfamily Mesochorinae have been given by T. Uchida (1933). In the course of the present investigation I have found 18 species in Formosa, of which sixteen are new to science and one is new to Formosa. It seems that Formosa has a comparatively rich fauna of the Mesochorinae. According to Townes (1971), the members of this subfamily have been known as secondary parasites of Ichneumonidae, Braconidae, Tachinidae, and probably other families. No host record is, however, given in the Formosan species.

All specimens, including type specimens of the new species described herein, are preserved in the collection of the Entomological Laboratory, Kagoshima University, Kagoshima.

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Subfamily Mesochorinae

1. *Stictopisthus takemotoi* sp. nov. (Figs. 10, 40 & 57)

♀. Face rather strongly convex, especially on the lower portion, 1.4 times as wide as high, strongly and rather sparsely punctate; upper transverse carina strong, not dipped at the center; inner margins of eyes parallel-sided; clypeus slightly convex, with a few large, setiferous punctures, the apical margin blunt and subtruncate; malar space very finely striate, about as long as basal width of mandible; mandible rather slender, about 1.7 times as long as its basal width, with a dull, elongate, subapical protuberance, the upper tooth a little longer than the lower; temple strongly and rather sparsely punctate, $2/3$ as long as eye in lateral view, the lower portion vertically striate; occipital carina distinct and complete; distance between lateral ocelli and eyes about 1.7 times as long as diameter of an ocellus; frons polished, virtually bare, with a weak prominence just below anterior ocellus with a distinct vertical groove, and with a short and weak carinae on median bottom. Antenna about 1.3 times as long as forewing, with 35 segments; 1st flagellar segment 5.3 times as long as wide; 2nd flagellar segment $2/3$ as long as the 1st and about 1.2 times as long as the 3rd. Pronotum densely haired, the hairs sparser centrally and ventrally; mesoscutum finely and rather sparsely punctate, coarsely punctate on posteromedian portion; notaulus weakly impressed, reaching to apical $3/7$; scutellum short, weakly convex; mesopleurum strongly to weakly punctate on lower portion, virtually bare on median portion, and weakly and densely punctate on dorsal portion; mesosternum rather densely haired; metapleurum with distinct, sparse, setiferous punctures. Propodeum (Fig. 10) short, sparsely haired, strongly areolated; basal area about as long as wide at base, without hairs, the hind margin wide and truncate; areola about 1.6 times as long as wide at costula, receiving costula at basal $3/7$, with 3 hairs; petiolar area 1.1 times as long as wide and about 1.1 times as long as areola; propodeal spiracle circular, situated equidistant from pleural and lateral longitudinal carinae; 1st pleural area finely and vertically striate. Leg with hind femur about 3.8 times as long as wide in lateral view; hind metatarsus 2.8 times as long as 2nd tarsal segment; tarsal claws weakly pectinate at base, hind ones each with 2 or 3 fine teeth. Wings (Figs. 40 & 57) with nervulus postfurcal by about its own length; stigma short, 2.8 times as long as wide, with radius emitting from basal $3/5$; areolet large, receiving 2nd recurrent vein a little basad of the middle; 3rd abscissa of discoideus about as long as the 2nd; nervellus vertical, 1.6 times as long as intercubitella; brachiella very short, present on basal $2/7$; 2nd abscissa of cubitella unpigmented. Abdomen polished, virtually bare, the lateral sides of 4th to 6th tergites sparsely haired; 1st tergite about 3.3 times as long as wide at apex; postpetiole about 1.5 times as long as wide at apex, longitudinally striate on about apical $5/7$; 2nd tergite 1.3 times as long as wide at apex and about 1.1 times as long as the 3rd; ovipositor sheath straight, moderately wide, about 6.7 times

as long as wide, about 1/2 as long as hind tibia, and sparsely haired.

Pale yellow to light yellowish brown. Apical teeth of mandible dark brown; ocellar area yellowish brown. Antennae fuscous, paler basally. Mesoscutum with three large dark brown markings, the marking of median lobe extending to basal 1/3; concavities of wings dark brown. Propodeum light yellowish brown, the areola, 1st lateral area except for basolateral corner and basal part of areola, and 2nd lateral area black. Legs with hind femur light fuscous, a little darker apically; hind tibia pale yellow, the basal and apical 1/5 blackish; all tibial spurs light fuscous; all tarsi light fuscous, a little paler basally. First tergite with a large, black median marking, the basal and apical 1/4 light yellowish brown; 1st sternite light yellowish brown; 2nd tergite light yellowish brown, with a pair of large lateral subtriangular markings; 3rd tergite light yellowish brown, dark brown on apicodorsal 1/2. Ovipositor sheath fusco-ferruginous. Wings hyaline; stigma infusate.

Length: Body 4.5 mm., forewing 3.9 mm.

♂. Unknown.

Holotype. ♀, Formosa: Jihyetan, 750 m, Nantou Hsien, 27-iv-1981, H. Takemoto leg.

Distribution: Formosa.

This species is very similar to the Japanese *S. punctatus* Nakanishi, 1968, but it is readily distinguished from the latter by the weakly pectinate tarsal claws, the completely areolated propodeum, and the light yellowish brown mesoscutum with three large dark brown markings.

Key to the Formosan species of *Astiphromma*

1. Face without any striate area; inner margins of eyes weakly convergent ventrally (Fig. 2); malar space short, 1/2 as long as basal width of mandible. Propodeum with basal area confluent with areola. Nervellus intercepted (Fig. 42). Second tergite with a large, triangular yellowish brown marking; 3rd and 4th tergites dark brown laterally, light yellowish brown dorsally. 3. *confusum* sp. nov.
- Face with a striate area on lower corner; inner margins of eyes weakly divergent ventrally (Fig. 1); malar space long, 1.0-1.2 times as long as basal width of mandible. Propodeum with basal area separated from areola by a distinct carina. Nervellus intercepted (Fig. 41). Second tergite blackish, with a narrow, yellowish brown apical band; 3rd and 4th tergites dark brown, a little paler basally.
..... 2. *ohharai* sp. nov.

2. *Astiphromma ohharai* sp. nov. (Figs. 1, 24 & 41)

♀. Face about 1.3 times as wide as high, mat with fine sparse punctures; lower 1/3 of facial orbit obliquely and finely striate; inner margins of eyes slightly divergent ventrally (Fig. 1); clypeus slightly convex, the apical margin thick and truncate; malar space finely striate, long, about 1.2 times as long as basal width of mandible;

mandible small, about 1.2 times as long as its basal width, the apical teeth equal in length; temple weakly mat, with very fine, rather sparse, setiferous punctures, about $1/2$ as long as eye in lateral view; distance between lateral ocelli and eyes about 2.0 times as long as diameter of an ocellus; occipital carina distinct, in the middorsal area slightly arched upward; frons polished, bare on median area, slightly mat with a few hairs on lateral area, with a dull prominence just below anterior ocellus. Antenna about 1.1 times as long as forewing, with 31 segments; 2nd flagellar segment about $3/5$ as long as the 1st and about 1.2 times as long as the 3rd. Pronotum very finely and rather sparsely punctate wholly; mesoscutum finely and densely punctate; notaulus obsolete; scutellum moderately strongly convex, rather densely haired, the apical part not specialized; mesopleurum polished, virtually bare, with a finely and sparsely haired area just below the subtegular ridge; prepectus finely and sparsely punctate; mesosternum densely haired; metapleurum with fine, rather dense, setiferous punctures. Propodeum rather long, polished, distinctly areolated; basal area small, incompletely confluent with 1st lateral area, the hind margin truncate; 1st lateral area and petiolar area densely haired; areola 2.0 times as long as wide at costula, receiving costula at basal $2/9$, without hairs; petiolar area short, $3/4$ as long as wide and $4/9$ as long as areola; 2nd and 3rd lateral areas and pleural area sparsely haired; propodeal spiracle small, subcircular, closer to pleural carina than to lateral longitudinal carina; lateral carina almost entirely absent on 1st and 2nd lateral areas. Hind femur slender, 5.1 times as long as wide in lateral view; hind metatarsus 2.6 times as long as 2nd tarsal segment; tarsal claws weakly pectinate basally, hind ones each with 2 or 3 rather strong but short teeth. Wings (Figs. 24 & 41) with nervulus postfurcal by $4/7$ of its own length; stigma narrow, about 4.7 times as long as wide, with radius emitting from basal $3/5$; areolet receiving 2nd recurrent vein a little basad of the middle; 3rd abscissa of discoideus about 1.6 times as long as the 2nd; nervellus weakly reclivous, 1.3 times as long as intercubitella, not intercepted; brachiella absent; 2nd abscissa of cubitella very short, present as a short stub. Abdomen polished; 1st tergite about 2.7 times as long as wide at apex, with a few short hairs; postpetiole 1.4 times as long as wide at apex; dorsolateral carina distinct and complete; 2nd tergite about as long as wide at apex and 1.2 times as long as the 3rd, with fine, dense, setiferous punctures, the hairs very short; 3rd and following tergites with dense and fine setiferous punctures as in the 2nd tergite. Subgenital plate with dense and short hairs; ovipositor sheath moderately wide, 7.2 times as long as wide and about $7/9$ as long as hind tibia, densely haired wholly.

Black. Face largely dark brown; clypeus, ventrolateral $1/2$ of face, malar space, mouth parts except for mandibular teeth dull ferruginous, lower $1/3$ of temple and postoccipt whitish. Antennae fuscous. Propleurum yellowish brown to dark brown, darker basally; pronotum weakly tinged with dark brown, the anterior margin and posterodorsal corner whitish to yellowish brown; tegula and subtegular ridge whitish yellow; mesopleurum dark brown on about dorsal $1/2$, yellowish brown on about ventral $1/2$; mesosternum light yellowish brown; scutellum fulvous; mesoscutum,

metapleurum and propodeum blackish. Abdominal tergites dark brown to black; extreme apex of 1st tergite, apical 1/7 of 2nd tergite, extreme both ends of 3rd and 4th tergites light yellowish brown. Subgenital plate light yellowish brown; ovipositor sheath infusate, the tip yellowish brown. Front and middle legs with coxae and trochanters pale yellow; femora yellowish brown; tibiae and tarsi fuscous. Hind leg with coxa yellowish brown, dark brown on apicodorsal portion; 1st trochanter pale yellow; 2nd trochanter and femur fuscous, the inner side becoming a little paler; tibia fuscous, the both ends infusate; tarsus infusate. Wings subhyaline; stigma stramineous, the anterior and posterior margins infusate.

Length: Body 4.6 mm., forewing 4.3 mm.

♂. Differs from female as follows: —

Malar space 1.0 times as long as basal width of mandible; temple polished, 5/9 as wide as eye in lateral view. Antenna about 1.3 times as long as forewing, with 33 segments; 2nd flagellar segment 2/3 as long as the 1st. Propodeum with areola 2.1 times as long as wide at costula; median longitudinal carina on basal area obsolete. Hind femur about 4.9 times as long as wide in lateral view; hind metatarsus 2.4 times as long as the 2nd tarsal segment. Forewing with nervulus almost interstitial; nervellus about 1.5 times as long as intercubittella. Abdomen with 1st tergite 3.2 times as long as wide at apex; postpetiole 1.6 times as long as wide at apex; clasper 4/9 as long as hind tibia, the apex rounded. Face entirely whitish yellow; temple and postociput more extensively whitish yellow. Collar area and posterior margin of pronotum whitish yellow to light yellowish brown. Hind leg a little darker than in female.

Length: Body 4.4 mm., forewing 4.8 mm.

Holotype. ♀, Formosa: Jumeitang, Alishan, Chiai, 14-iv-1984, K. Ôhara leg. Paratype. Formosa: 1♂ (right flagellum lacking), same data as holotype.

Distribution: Formosa.

This species is very closely related to the Japanese *A. petiolatum* Nakanishi, 1969. It can easily be separated from the latter by the unstriated postpetiole, the areola which is separated from basal area, the dark brown face in the female, the colouration of the 2nd and following abdominal tergites.

3. *Astiphromma confusum* sp. nov. (Figs. 2, 25 & 42)

♂. Face about 1.1 times as wide as high, faintly mat, with distinct, rather dense, setiferous punctures, and unstriated areas; inner margins of face weakly convergent ventrally (Fig. 2); clypeus weakly convex, with a few long hairs, the apical margin thick and weakly convex; malar space not striate, very narrow, 1/2 as long as basal width; mandible short, 1.3 times as long as its basal width, the apical teeth approximately equal in length; temple narrow, about 1/2 as long as eye in lateral view, with distinct, rather dense, setiferous punctures; frons subpolished, faintly mat, weakly convex medially, with a few hairs; distance between lateral ocelli and eyes 1.5-1.6

times as long as diameter of an ocellus; occipital carina distinct and complete. Antenna about 1.2 times as long as forewing, with 33-35 segments; 2nd flagellar segment about $2/3$ as long as the 1st and about 1.1 times as long as the 3rd. Pronotum finely and densely punctate wholly; mesoscutum with dense, fine, setiferous punctures; scutellum weakly convex, rather sparsely and weakly punctate; mesopleurum sparsely and weakly punctate, the punctures sparser centrally; speculum polished and bare; prepectus sparsely haired; mesosternum densely haired; metapleurum with dense and fine setiferous punctures. Propodeum polished, distinctly and completely areolated, but the basal area confluent with areola; basal area, areola, 2nd lateral and pleural areas and 3rd pleural area sparsely haired; 1st lateral area and petiolar area densely haired; areola long, about 2.4 times as long as wide at costula, receiving costula at about basal $1/3$; petiolar area short, about $3/4$ as long as wide and about $1/2$ as long as areola; propodeal spiracle small, subcircular, touching pleural carina; lateral longitudinal carina absent on 1st lateral area. Legs with hind femur slender, 4.2-4.4 times as long as wide in lateral view; hind coxa faintly mat; hind metatarsus 2.3-2.5 times as long as 2nd tarsal segment; tarsal claws weakly pectinate at extreme base, hind ones each with 2 or 3 weak teeth. Wings (Figs. 25 & 42) with nervulus postfurcal by $2/5-1/2$ of its own length; stigma narrow, about 4.4 times as long as wide, with radius emitting from basal $4/7$; areolet large, receiving 2nd recurrent vein a little basal of the middle; 3rd abscissa of discoideus about 1.3 times as long as the 2nd; nervellus subvertical, intercepted at lower $1/7$, about 1.6 times as long as intercubittella; brachiella and discoidella slightly pigmented; apex of costula with 2 hamuli; metacarpella with 4 hamuli. First tergite polished, about 3.2 times as long as wide at apex, with very sparse, short hairs, and with a distinct and complete dorsolateral carina; postpetiole 1.5-1.7 times as long as wide at apex; 2nd tergite rather densely haired, about as long as wide at apex and about 1.2 times as long as the 3rd; 3rd and following tergites with dense and short hairs as in the 2nd; clasper $1/2$ as long as hind tibia, the apex rounded.

Black. Head black except for following whitish parts: face, clypeus, palpi, mandible, lower corner of frons and lower $1/3$ of temple. Scape and pedicel infusate, yellowish brown ventrally; flagellum infusate, a little paler basally. Pronotum light yellowish brown, dark brown along median dorsal margin; propleurum, tegula and subtegular ridge pale yellow; mesopleurum light yellowish brown on about ventral $1/2$, dark brown on about dorsal $1/2$; prepectus and mesosternum light yellowish brown. Front and middle legs pale yellow to light yellowish brown, the apical segments of tarsi a little darker. Hind leg with coxa pale yellow, with an indistinct apicodorsal dark brown band; trochanter pale yellow; femur fuscous, paler basally; tibia fuscous, darker basally and apically; tarsus infusate. First tergite black, with a small apical yellowish spot; 2nd tergite black, with a large, apicomedian triangular marking; 3rd tergite dark brown, with a median longitudinal yellowish band; 4th tergite dark brown, dirty yellowish brown dorsally, with a narrow apical yellowish band; 5th and following tergites dark brown; clasper dirty yellowish brown. Wings

subhyaline; stigma fuscous, a little darker anteriorly.

Length: Body 4.5–5.5 mm., forewing 4.7–5.0 mm.

♀. Unknown.

Holotype. ♂, Formosa: Meifeng-Tsuifeng, 2200–2300 m, Nantou Hsien, 16–17-iv-1984, T. Gotô leg. Paratype. Formosa: 1♂, 16–17-iv-1984, Meifeng-Tsuifeng, 2200–2300 m, Nantou Hsien, K. Ôhara leg.

Distribution: Formosa.

In general appearance and colouration this species is most closely related to the Japanese *A. petiolatum* Nakanishi, 1969, but it is at once distinguished from the latter by the inner margins of eyes which are weakly convergent ventrally, the comparatively short unstriated 1st tergite, and the entirely black scutellum. Furthermore, this species is similar to the preceding species, *A. ohharai* sp. nov., for the inner margins of the eyes which are convergent ventrally, and the unstriated face, etc. as mentioned in the key.

Key to the Formosan species of *Mesochorus*

1. Propodeum (Figs. 9 & 11) subpolished, short, very strongly areolated; basal area raised; costula originating from basal 2/3 of areola. Scutellum strongly punctate. wings (Figs. 26 & 43) with nervulus interstitial; nervellus vertical; apex of costella with 4 hamuli; metacarpella with 5 hamuli. 4. *jihyetanus* sp. nov.
- Propodeum (Figs. 12–23) polished, short to long, weakly to moderately areolated; basal area not raised; costula originating from basal 2/9–1/2 of areola. Scutellum weakly punctate, the apical portion not specialized. Wings (Figs. 27–39 & 44–56) with nervulus antefurcal, interstitial, or postfurcal; apex of costella with 1 or 3 hamuli; metacarpella with 4 or 5 hamuli. 2.
2. Forewing with nervulus interstitial (Fig. 27). Body almost entirely yellowish brown or light ferruginous. 3
- Forewing with nervulus antefurcal, interstitial, or postfurcal. Body black with yellowish markings, or yellowish brown with blackish markings. 4
3. Flagellum with 49 or 50 segments. Clasper (Fig. 7) comparatively long, about 1/2 as long as hind tibia, the apex pointed, with sparse, slanted hairs. Apex of costella with 3 hamuli. Thorax light ferruginous; mesoscutum with 3 dark brown longitudinal bands. 5. *tattakensis* Uchida
- Flagellum with 43 segments. Clasper (Fig. 8) comparatively short, 1/3 as long as hind tibia, with very sparse, erected hairs, the apex rounded. Apex of costella with 1 hamulus. Thorax yellowish brown; mesoscutum without dark brown bands, the base of median lobe darker. 6. *castaneus* Uchida
4. Nervulus antefurcal (Fig. 28). Ovipositor sheath wide, densely haired. Prepectus vertically striate. Mesoscutum ferruginous, dark brown basally; mesopleurum, mesosternum and scutellum entirely ferruginous. . . . 7. *rubranotatus* sp. nov.
- Nervulus interstitial or postfurcal (Figs. 29–39). Ovipositor sheath narrow, sparsely to densely haired. Prepectus weakly to strongly punctate. Mesoscutum

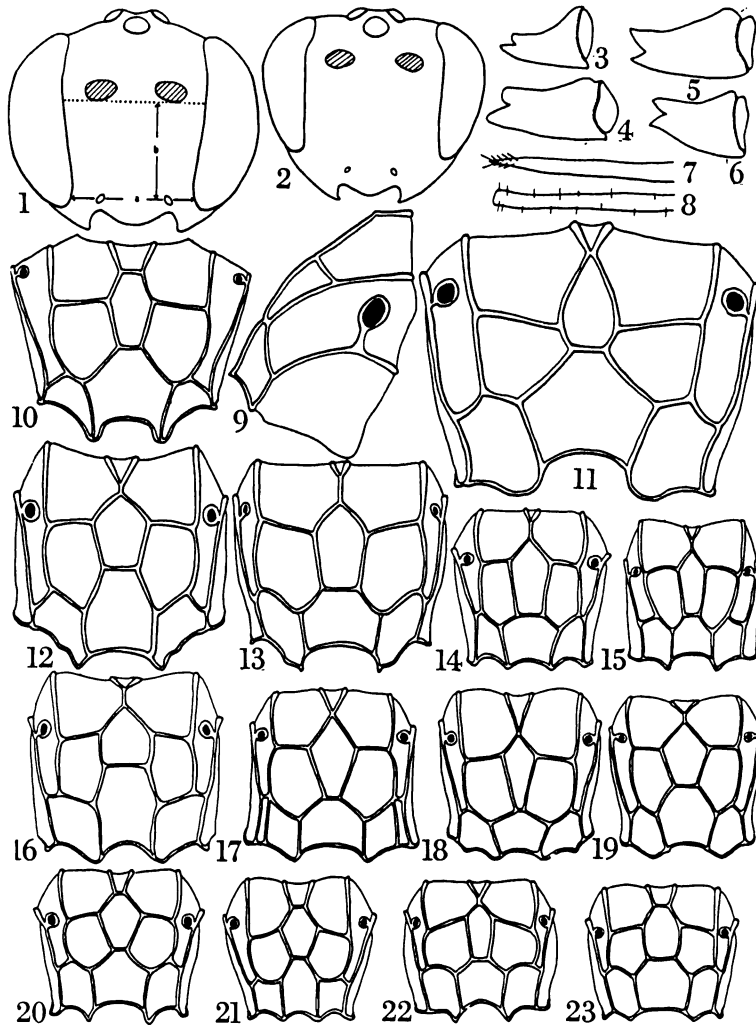
- black with yellowish markings, or yellowish brown with blackish markings; mesopleurum and mesosternum black, dark brown, or yellowish brown. 5
5. Head with occipital carina present laterally, absent dorsally; lower tooth of mandible clearly longer than the upper (Figs. 3 & 4). 6
- Head with occipital carina complete, or incomplete, when incomplete, the dorso-median area narrowly interrupted; lower tooth of mandible equal or shorter than the upper (Figs. 5 & 6). 7
6. Flagellum with 37-41 segments. Temple strongly and densely punctate; mandible very stout, 1.8-2.1 times as long as its basal width; lower 1/2 of facial orbit strongly striate. Mesosternum, mesopleurum, propodeum in female, metapleurum and abdominal tergites yellowish brown to light ferruginous; stigma infuscate. 8. *hashimotoi* sp. nov.
- Flagellum with 31 segments. Temple finely and sparsely punctate; mandible small, short, 1.4 times as long as its basal width; facial orbit not striate. Mesoscutum, meso- and metapleurum, propodeum and abdominal tergites black; stigma fuscous. 15. *instriatus* sp. nov.
7. Mesoscutum and propodeum entirely black. 8
- Mesoscutum yellowish brown with longitudinal dark brown bands; propodeum entirely yellowish brown, or yellowish brown with a dark brown marking. .. 13
8. Frons polished, impunctate medially, sparsely and weakly punctate laterally, with a deep, median pit at bottom. Mesosternum yellowish brown to blackish; stigma fuscous. 9
- Frons subpolished, finely and rather densely punctate, or transversely striate with distinct punctures, without a median pit at bottom. Mesosternum entirely black; stigma almost entirely pale. 11
9. Forewing (Fig. 34) with nervulus interstitial; 3rd abscissa of discoideus 3.2 times as long as the 2nd; nervellus strongly reclivous (Fig. 51). 13. *interstitialis* sp. nov.
- Forewing (Figs. 33 & 35) with nervulus postfurcal; 3rd abscissa of discoideus 1.5-1.8 times as long as the 2nd; nervellus subvertical or weakly reclivous (Figs. 50 & 52). 10
10. Forewing (Fig. 35) with stigma large, 3.1 times as long as wide, with radius emitting from basal 5/9. Propodeum (Fig. 23) with areola 1.6 times as long as wide at costula; petiolar area as long as wide. Mandible and postpetiole not striate. Clasper short, 2/5 as long as hind tibia. Frontal orbit and dorsal 1/3 of tempolar orbit blackish. 14. *stigmatus* sp. nov.
- Forewing (Fig. 33) with stigma slender, 3.6-3.8 times as long as wide, with radius emitting from basal 2/3. Propodeum (Fig. 18) with areola 2.2-2.5 times as long as wide at costula; petiolar area shorter than its width. Mandible transversely striate. Postpetiole weakly and longitudinally striate; clasper long, 5/9 as long as hind tibia. Frontal and tempolar orbits yellowish brown. 12. *microbathros* sp. nov.

11. Temple with distinct, dense, setiferous punctures; distance between lateral ocelli and eyes 1.3 times as long as diameter of an ocellus. Tarsal claws simple. Face yellowish brown, with a large blackish median marking; hind coxa entirely black. 18. *atricoxalis* sp. nov.
- Temple with weak, sparse, setiferous punctures; distance between lateral ocelli and eyes 2.0–2.1 times as long as diameter of an ocellus. Tarsal claws weakly pectinate. Face entirely fulvous, or yellowish brown with a dark brown spot just below antennal sockets; hind coxa pale yellow to fulvous ventrally, blackish dorsally. 12
12. Temple more densely punctate; malar space 1.0 times as long as basal width of mandible in male. First tergite comparatively slender, 3.1 times as long as wide at apex. Occiput fulvous, with a dark brown dorsomedian band; postocciput fulvous; propodeum fulvous, dark brown on dorsal area; mesosternum and mesopleurum fulvous. 17. *turgidus* sp. nov.
- Temple more sparsely and weakly punctate; malar space 1.0 times as long as basal width of mandible in female, 3/4–6/7 in male. First tergite comparatively stout, 2.6–2.9 times as long as wide at apex. Occiput and postocciput blackish; pronotum dark brown, slightly tinged with yellowish brown; mesosternum and mesopleurum blackish. 16. *monomaculatus* sp. nov.
13. Propodeum with areola 1.9 times as long as wide at costula; petiolar area about as long as wide and 2/3 as long as areola. Forewing with nervulus postfurcal by 1/6 of its own length (Fig. 31); nervellus more strongly reclivous (Fig. 48). First flagellar segment 1.1 times as long as the 2nd. Hind femur comparatively slender, 5.1 times as long as wide in lateral view. Ovipositor sheath densely haired. ... 10. *dentus* sp. nov.
- Propodeum with areola 1.3–1.5 times as long as wide at costula; petiolar area 1.1–1.4 times as long as wide and 1.0–1.5 times as long as areola. Forewing with nervulus postfurcal by 1/2–4/7 of its own length (Figs. 30 & 32); nervellus less strongly reclivous (Figs. 47 & 49). First flagellar segment 1.6–1.8 times as long as the 2nd. Hind femur comparatively stout, 4.0–4.8 times as long as wide in lateral view. Ovipositor sheath sparsely haired. 14
14. Propodeum (Fig. 16) with basal area very small, with a long stalk on posterior margin; petiolar area 1.3–1.5 times as long as areola. Ovipositor sheath 10.8 times as long as wide. Propodeum fulvous, the basal area, 1st and 2nd lateral areas and areola more or less blackish in both sexes. 9. *takizawai* sp. nov.
- Propodeum (Fig. 19) with basal area rather large, the posterior margin pointed, without a stalk on posterior margin; petiolar area about 1.0 times as long as areola. Ovipositor sheath 9.0 times as long as wide. Propodeum fulvous, with a pair of dark brown bands along lateral longitudinal carina in female, entirely fulvous in male. 11. *taiwanensis* sp. nov.

4. *Mesochorus jhiyetanus* sp. nov. (Figs. 9, 11, 26 & 43)

♀. Face strongly and rather densely punctate, about 1.4 times as wide as high; upper transverse carina of face rather strongly dipped downward at the center; clypeus flat, with sparse, large, setiferous punctures, the apical margin thick and weakly convex; malar space about $1/3$ as long as basal width of mandible; mandible stout, weakly tapering towards apex, about 1.7 times as long as its basal width, the lower tooth a little shorter and smaller than the upper; frons polished, transversely and finely striate on lateral area, with a wide, shallow, median vertical groove; temple distinctly and rather sparsely punctate, narrow, about $2/5$ as long as eye in lateral view; occipital carina weak laterally, absent dorsally; distance between lateral ocelli and eyes $5/9$ as long as diameter of an ocellus. Antenna about 1.4 times as long as forewing, with 41 segments; 1st flagellar segment 1.6 times as long as the 2nd. Pronotum rather densely and weakly punctate wholly; mesoscutum strongly and densely punctate; notaulus obsolete; prescutellar transverse groove with weak, sparse punctures, and with weak longitudinal rugulae; scutellum moderately strongly convex, with dense, setiferous punctures, the apical portion pointed, and the apical margin subtruncate; mesopleurum polished, coarsely and densely punctate; prepectus densely and weakly punctate; mesosternum subpolished, with weak, dense, setiferous punctures. Propodeum (Figs. 9 & 11) subpolished, short, very strongly and completely areolated, the basal area raised; areola 1.5 times as long as wide at costula, with costula originating from basal $2/3$; petiolar area about 1.1 times as long as wide and about 1.5 times as long as areola; propodeal spiracle large, subcircular, closer to lateral longitudinal carina than to pleural carina. Hind femur 5.0 times as long as wide in lateral view; hind metatarsus about 2.8 times as long as 2nd tarsal segment; tarsal claws strongly pectinate, hind ones each with 5 or 6 strong teeth. Wings (Figs. 26 & 43) with nervulus interstitial; stigma large, 3.3 times as long as wide, with radius emitting from basal $2/3$; areolet receiving 2nd recurrent vein basal of the middle; 3rd abscissa of discoideus about 2.4 times as long as the 2nd; nervellus vertical, about 1.6 times as long as intercubittella; apex of costella with 4 hamuli; metacarpella with 5 hamuli. Abdomen polished; 1st tergite 3.3 times as long as wide at apex, with very sparse hairs; postpetiole 1.5 times as long as wide at apex; 2nd tergite sparsely haired, bare on median portion, about as long as wide at apex, about 1.2 times as long as the 3rd; 3rd tergite rather sparsely haired, the hairs denser basolaterally, sparser apically, and bare on posteromedian portion; 4th and subsequent tergites sparsely haired. Subgenital plate large, with dense and long hairs, and with a distinct median longitudinal groove; ovipositor sheath wide, about 5.8 times as long as wide, about $1/2$ as long as hind tibia, and densely haired wholly.

Blackish. Face largely blackish brown; inner orbit whitish yellow; outer orbit narrowly tinged with dark brown; temple dark brown to blackish brown; lower part of temple and malar space whitish yellow; vertex and occiput blackish; clypeus yellowish brown; mandible whitish yellow, the apical teeth dark brown; palpi pale. Antennae yellowish brown, a little darker apically. Propleurum dark brown;



Figs. 1-2. Head in frontal view: 1, *Astiphromma ohharai* sp. nov., ♂ (a, width of face; b, height of face); 2, *A. confusum* sp. nov., ♂.

Figs. 3-6. Mandibles: 3, *Mesochorus instriatus* sp. nov., ♀; 4, *M. hashimotoi* sp. nov., ♀; 5, *M. tattakensis* Uchida, ♂; 6, *M. interstitialis* sp. nov., ♂.

Figs. 7-8. Apical portion of clasper: 7, *M. tattakensis* Uchida; 8, *M. castaneus* Uchida.

Fig. 9. Propodeum in lateral view: *M. jihyetanus* sp. nov., ♀.

Figs. 10-23. Areolation of propodea in dorsal view: 10, *Stictopisthus takemotoi* sp. nov., ♀; 11, *M. jihyetanus* sp. nov., ♀; 12, *M. hashimotoi* sp. nov., ♀; 13, *M. rubranotatus* sp. nov., ♀; 14, *M. dentus* sp. nov., ♀; 15, *M. interstitialis* sp. nov., ♂; 16, *M. takizawai* sp. nov., ♀; 17, *M. atricoxalis* sp. nov., ♀; 18, *M. microbathros* sp. nov., ♀; 19, *M. taiwanensis* sp. nov., ♀; 20, *M. monomaculatus* sp. nov., ♀; 21, *M. instriatus* sp. nov., ♀; 22, *M. turgidus* sp. nov., ♂; 23, *M. stigmatus* sp. nov., ♂.

pronotum dark brown, a little darker posteriorly; postscutellum dull ferruginous; mesopleurum black, the front, hind and dorsal margins tinged with yellowish brown; metapleurum and propodeum entirely fusco-testaceous. Front and middle legs light yellowish brown. Hind leg with coxa and femur light ferruginous; trochanter and tibia except for fulvous both ends light yellowish brown; tarsus light yellowish brown, a little darker apically. Abdominal tergites blackish; 1st tergite black, light yellowish brown on about basal 2/5; apical margin of 1st to 3rd tergites light yellowish brown. Ovipositor sheath dark brown, the apical part yellowish brown. Wings hyaline; stigma infusate.

Length: Body 6.4 mm., forewing 5.9 mm.

♂. Unknown.

Holotype. Formosa: Jihyetan, 750 m, Nantou Hsien, 27-iv-1981, H. Takemoto leg.

Distribution: Formosa.

This species is closely related to the Palearctic *M. politus* Gravenhorst, 1829, but it differs from the latter by the subpolished and strongly punctate pronotum, meso-scutum, meso- and metapleurum, and propodeum, the strongly areolated propodeum, the propodeal spiracle which is closer to the lateral longitudinal carina than to the pleural carina, and the apex of costella with 4 hamuli.

5. *Mesochorus tattakensis* Uchida (Figs. 5, 7, 27 & 44)

Mesochorus tattakensis Uchida, Ins. Mats. 8: 62, 1933.

The male of this species was previously unknown. On the basis of the present specimens a description of the male is given below: —

♂. Face moderately strongly and rather densely punctate, the punctures sparser laterally, about 1.2 times as wide as high; upper transverse ridge of face strongly dipped downward at the center; clypeus slightly convex, with large, sparse punctures, the apical margin thick and weakly convex; malar space 3/7 as long as basal width of mandible; mandible stout, weakly tapering towards apex, 1.6–1.7 times as long as its basal width, the lower tooth 5/7 as long as the upper (Fig. 5); temple weakly and rather sparsely punctate, narrow, about 1/2 as long as eye in lateral view; distance between lateral ocelli and eyes about 3/4 as long as diameter of an ocellus; frons polished, smooth, with a pair of concavities just above antennal sockets; occipital carina weak but distinct, with a narrow, dorsomedian interruption, Antenna about 1.6 times as long as forewing, with 51 or 52 segments; 1st flagellar segment about 1.5 times as long as the 2nd. Pronotum weakly and rather sparsely punctate, the punctures finer ventrally; mesoscutum with fine, dense, setiferous punctures; notaulus slightly impressed, present on about basal 1/2; prescutellar transverse groove very finely punctate; scutellum weakly convex, finely and sparsely punctate, the apical portion not specialized; mesopleurum moderately strongly and sparsely punctate; metapleurum with fine, sparse, setiferous punctures. Propodeum (Fig. 7) distinctly areolated, finely

and sparsely punctate, with long whitish hairs; basal area without a stalk on posterior margin, the posterior margin pointed; areola 2.3 times as long as wide at costula; costula originating from basal 1/3 of areola; petiolar area 0.9 times as long as wide and about 1/2 as long as areola; propodeal spiracle large, circular, closer to pleural carina than to lateral longitudinal carina. Hind femur slender, about 6.0 times as long as wide in lateral view; hind metatarsus 2.3 times as long as 2nd tarsal segment; tarsal claws not pectinate. Wings (Figs. 27 & 44) with nervulus interstitial; stigma large, 3.8 times as long as wide, with radius emitting from basal 2/3; areolet receiving 2nd recurrent vein a little basad of the middle; 3rd abscissa of discoideus 2.3–2.5 times as long as the 2nd; nervellus weakly reclivous, 1.8–2.0 times as long as intercubitella; apex of costella with 2 or 3 hamuli; metacarpella with 5 hamuli. Abdomen polished; 1st tergite about 4.3 times as long as wide at apex, with very sparse, long hairs; postpetiole 1.9–2.1 times as long as wide at apex; 2nd tergite about 1.5 times as long as wide at apex, about 1.3 times as long as the 3rd, very sparsely haired, the postero-medial portion virtually bare; 3rd and subsequent tergites sparsely haired laterally, virtually bare medially. Clasper (Fig. 7) about 1/2 as long as hind tibia, the apex pointed, with sparse, slanted hairs.

Light yellowish brown to light ferruginous. Face and clypeus light yellowish brown, a little paler laterally; malar space, lower part of temple, mandible except for dark brown apical teeth, palpi and subtegular ridge whitish yellow; temple except for lower part, vertex, frons and occiput light ferruginous; antennae light ferruginous, darker apically. Legs light yellowish brown, the hind coxa a little darker. Pronotum, pro-, meso- and metapleurum yellowish brown; mesoscutum ferruginous, the basal 1/4 of median lobe and lateral lobes largely blackish; scutellum, propodeum and abdomen ferruginous. Clasper light yellowish brown. Wings hyaline; stigma stramineous medially, infusate on anterior and posterior sides.

Length: Body 8.5–8.8 mm., forewing 7.2–7.4 mm.

Specimens examined. Formosa: 2♂♂, 17-iv-1981, Mt. Lalashan, 1300–1500 m, Taoyuan Hsien, K. Ôhara leg.

Distribution: Formosa.

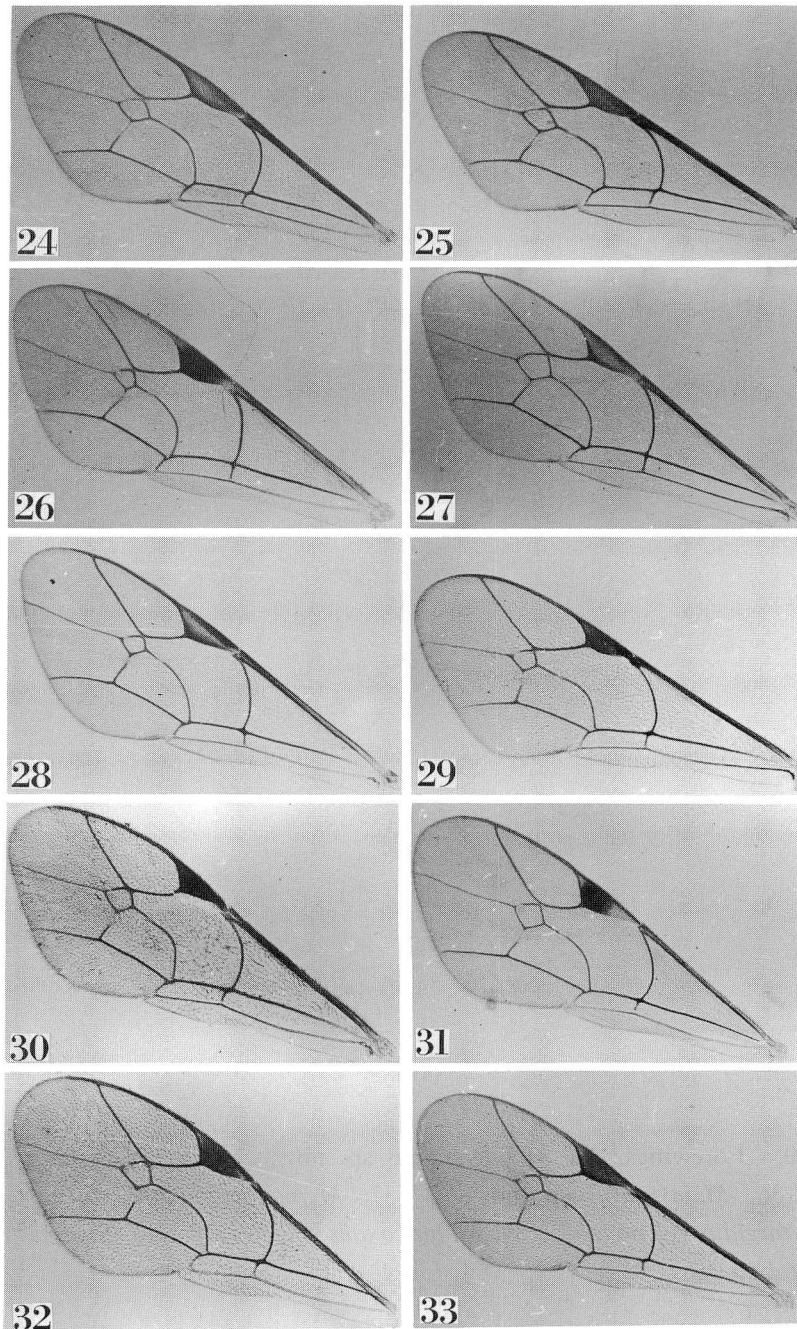
6. *Mesochorus castaneus* Uchida (Fig. 8)

Mesochorus castaneus Uchida, Proc. Imp. Acad. Tokyo 9: 74, 1933.

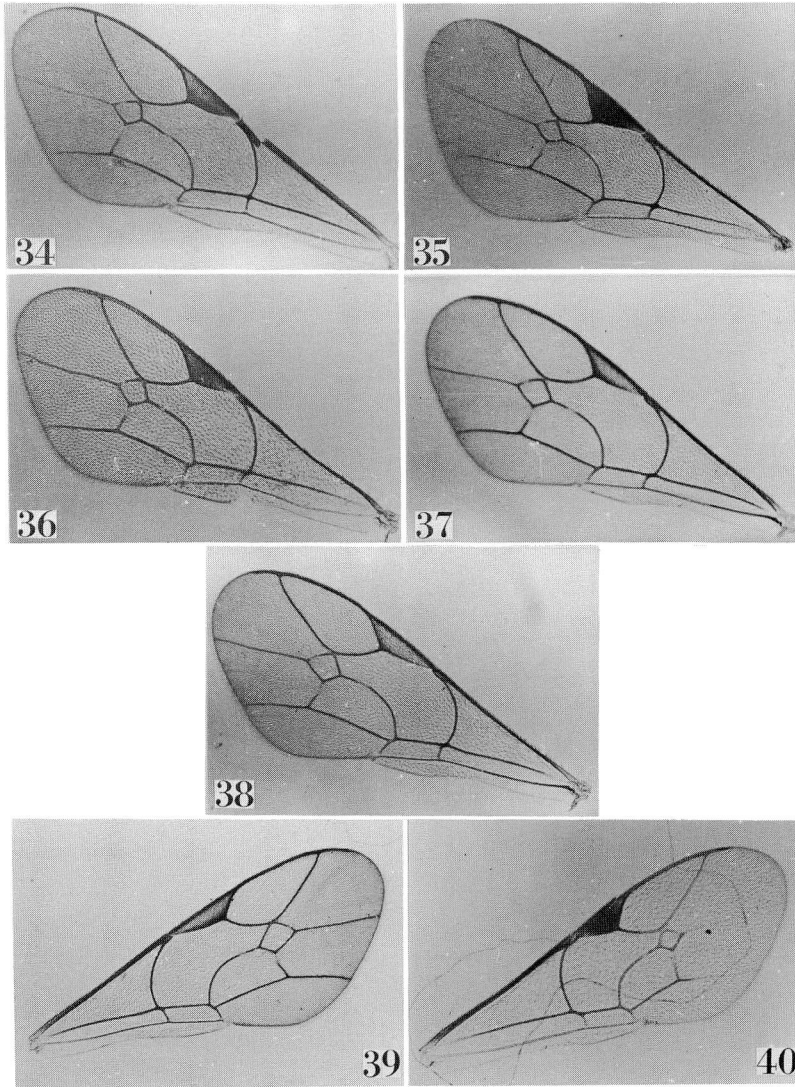
Specimen examined. Formosa: 1♂, 25-iv-1981, Meifeng-Tsuifeng, 2200–2300 m, Nantou Hsien, H. Takemoto leg.

This is the first of the species to be recorded in Formosa. The present material agrees well with the Japanese form except the body is a little paler.

Distribution: Formosa and Japan (Hokkaido; Honshu; Kyushu).



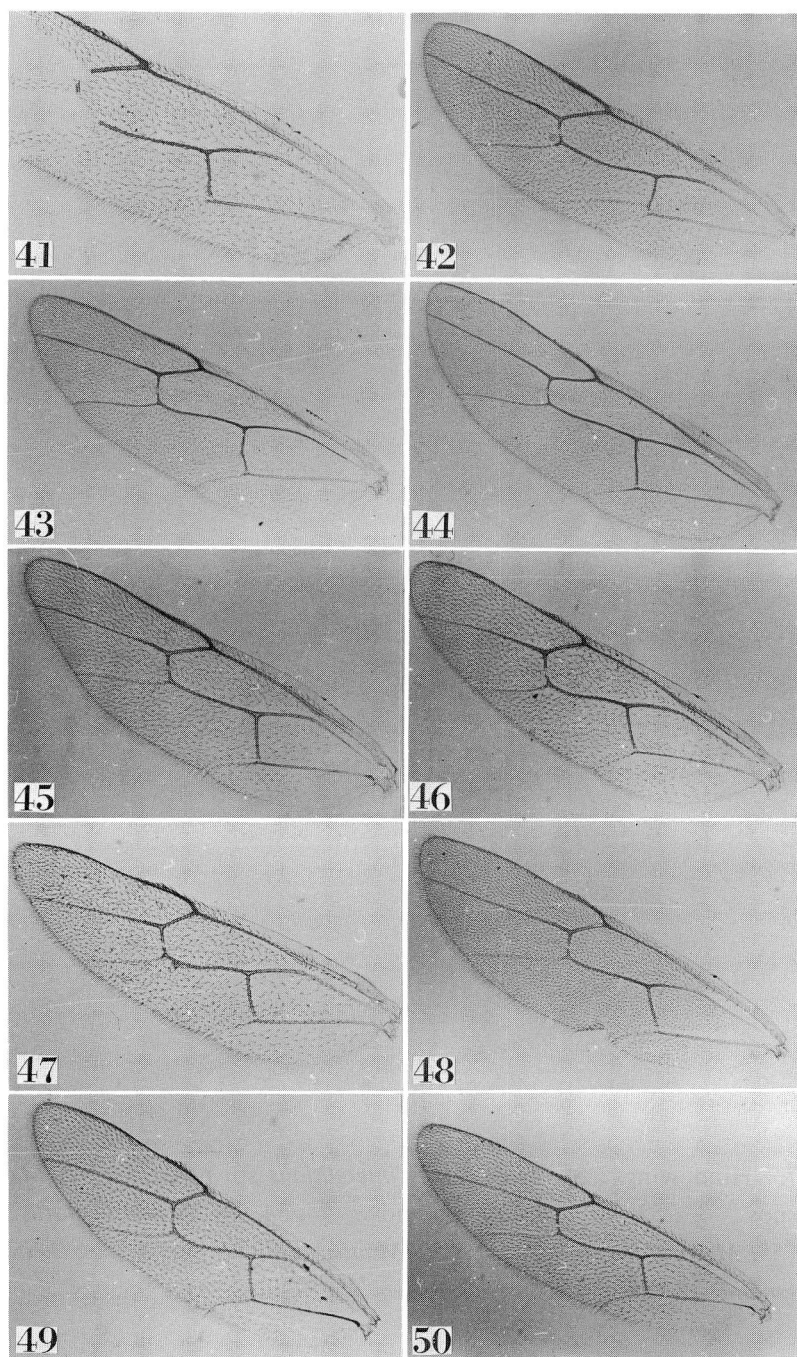
Figs. 24-33. Forewings: 24, *Astiphromma ohharai* sp. nov., ♀; 25, *A. confusum* sp. nov., ♂; 26, *M. jihyetanus* sp. nov., ♀; 27, *M. tattakensis* Uchida, ♂; 28, *M. rubranotatus* sp. nov., ♀; 29, *M. hashimotoi* sp. nov., ♀; 30, *M. takizawai* sp. nov., ♀; 31, *M. dentus* sp. nov., ♀; 32, *M. taiwanensis* sp. nov., ♀; 33, *M. microbathros* sp. nov., ♀.



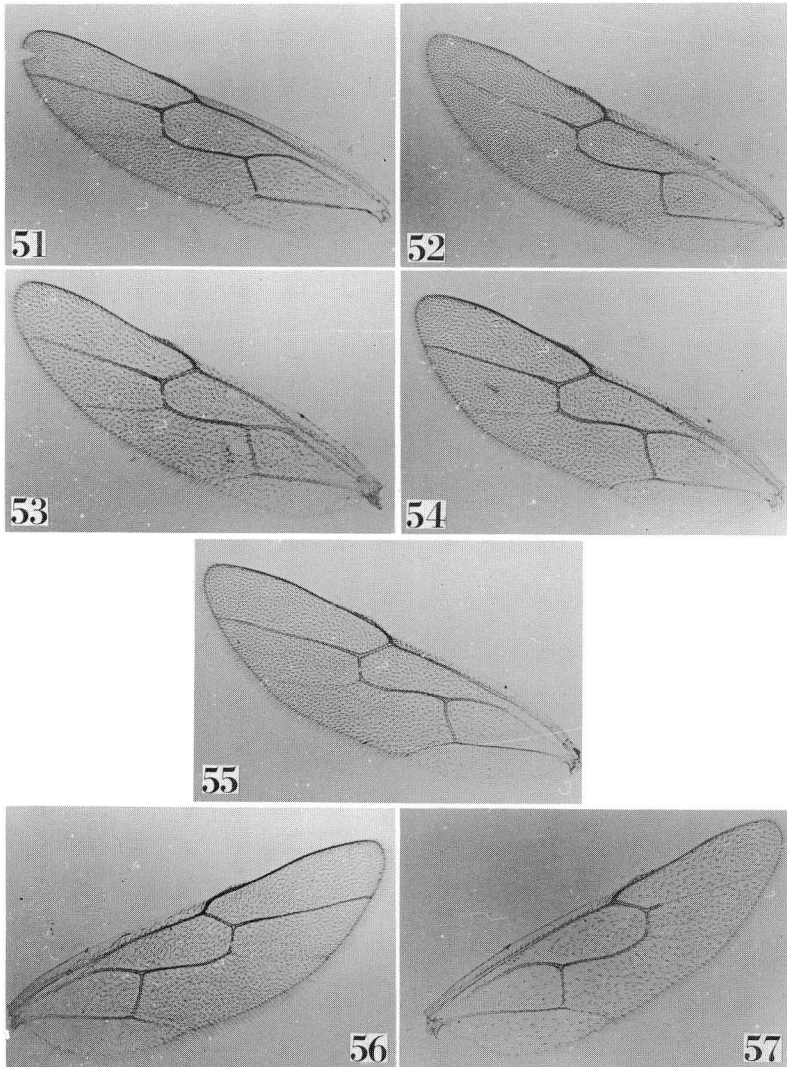
Figs. 34-40. Forewings: 34, *M. interstitialis* sp. nov., ♂; 35, *M. stigmatus* sp. nov., ♂; 36, *M. instriatus* sp. nov., ♀; 37, *M. monomaculatus* sp. nov., ♀; 38, *M. turgidus* sp. nov., ♂; 39, *M. atricoxalis* sp. nov., ♀; 40, *Stictopisthus take-motoi* sp. nov., ♀.

7. *Mesochorus rubranotatus* sp. nov. (Figs. 13, 28 & 45)

♀. Face about 1.3 times as wide as high, strongly and densely punctate, the punctures sparser laterally; upper transverse carina of face strongly dipped downward at the center; clypeus slightly convex, with large, sparse, setiferous punctures, the apical margin thick and weakly convex; malar space $5/8$ as long as basal width of mandible; mandible stout, weakly tapering towards apex, 1.6 times as long as its basal



Figs. 41-50. Hind wings: 41, *Astiphromma ohharai* sp. nov., ♀; 42, *A. confusum* sp. nov., ♂; 43, *Mesochorus jhyetanus* sp. nov., ♀; 44, *M. tattakensis* Uchida, ♂; 45, *M. rubranotatus* sp. nov., ♀; 46, *M. hashimotoi* sp. nov., ♀; 47, *M. takizawai* sp. nov., ♀; 48, *M. dentus* sp. nov., ♀; 49, *M. taiwanensis* sp. nov., ♀; 50, *M. microbathros* sp. nov., ♀.



Figs. 51-57. Hind wings: 51, *Mesochorus interstitialis* sp. nov., ♂; 52, *M. stigmatus* sp. nov., ♂; 53, *M. instriatus* sp. nov., ♀; 54, *M. monomaculatus* sp. nov., ♀; 55, *M. turgidus* sp. nov., ♂; 56, *M. atricoxalis* sp. nov., ♀; 57, *Stictopisthus takemotoi* sp. nov., ♀.

width, the lower tooth slightly shorter than the upper; temple distinctly and rather densely punctate, $2/3$ as long as eye in lateral view; distance between lateral ocelli and eyes about 1.3 times as long as diameter of an ocellus; frons polished, mostly impunctate, weakly punctate on dorsal margin, with a pair of shallow concavities; occipital carina strong laterally, weak dorsally, with a narrow dorsomedian interruption. Antenna about 1.2 times as long as forewing, with 36 segments; 1st flagellar segment

2.0 times as long as the 2nd. Pronotum weakly and rather densely punctate, the punctures finer ventrally; mesoscutum with fine, dense, setiferous punctures; notaulus very weak, reaching to the center; prescutellar transverse groove finely and rather sparsely punctate; scutellum moderately convex, very finely and rather sparsely punctate, the apical portion not specialized; mesopleurum rather weakly punctate, the punctures sparser ventrally and posteriorly; metapleurum with moderately dense, fine, setiferous punctures; prepectus finely and vertically striate, with weak punctures. Propodeum (Fig. 13) rather strongly areolated, rather densely haired, the areola and inner posterior half of 2nd lateral area virtually bare; areola 1.6 times as long as wide at costula, with costula originating from basal $2/5$; basal area small, with a long stalk on posterior margin; propodeal spiracle rather small, situated at equal distance of lateral and pleural carinae. Hind femur 4.9 times as long as wide in lateral view; hind metatarsus 2.5 times as long as 2nd tarsal segment; tarsal claws weakly pectinate basally, hind ones each with 3 small teeth. Wings (Figs. 28 & 45) with nervulus antefurcal by $2/7$ of its own length; stigma rather narrow, 3.6 times as long as wide, with radius emitting from basal $2/3$; areolet receiving 2nd recurrent vein at the middle; 3rd abscissa of discoideus 2.2 times as long as the 2nd; nervellus weakly reclivous, 1.7 times as long as intercubitella; apex of costella with 1 hamulus; metacarpella with 5 hamuli. Abdomen polished; 1st tergite 2.4 times as long as wide at apex, with very sparse short hairs; postpetiole 1.2 times as long as wide at apex; 2nd tergite about as long as wide at apex and about 1.3 times as long as the 3rd, with very short and very sparse hairs, a large median portion virtually bare; 3rd and following tergites very sparsely haired, but the lateral sides of each tergite rather densely haired. Subgenital plate largely bare, the base and apex with short dense hairs; ovipositor sheath moderately wide, 7.0 times as long as wide and about $1/2$ as long as hind tibia.

Black. Face blackish; facial orbit and lower $2/3$ of frontal orbit, clypeus, malar space, lower part of temple, mandible except for dark brown apical teeth, and palpi whitish yellow; frons except for frontal orbit blackish; upper $1/2$ of frontal orbit light ferrugeneous; outer orbit narrowly tinged with dark brown; temple except for outer orbit, vertex, and occiput blackish brown to black; antennae infusate. Propleurum dark brown basally, light yellowish brown apically; pronotum blackish, light brown on ventral margin and posterodorsal corner; mesoscutum dull ferrugineous, blackish on about basal $1/3$ of median lobe; scutellum, postscutellum, mesopleurum and mesosternum ferrugineous; tegula and subtegular ridge pale yellow, upper division of metapleurum ferrugineous, darker dorsally; metapleurum ferrugineous on about anterior $2/3$, blackish on posterior $1/3$. Legs stramineous; both ends of hind tibia and hind tarsus infusate. Abdomen black; extreme apices of 1st and 2nd tergites slightly tinged with yellowish brown; subgenital plate dark brown, pale yellow ventrally; ovipositor sheath infusate, the tip light yellowish brown. Wings hyaline; stigma largely stramineous, the anterior and posterior margins piceous.

Length: Body 6.2 mm., forewing 4.9 mm.

♂. Unknown.

Holotype. ♀, Formosa: Meifeng-Tsuifeng, 2200–2300 m, Nantou Hsien, 27-iv-1981, K. Ôhara leg.

Distribution: Formosa.

This species may be immediately distinguished from any other congeneric Formosan species by the antefurcal nervulus, the vertically striate prepectus, and the ferruginous mesoscutum, mesopleurum and mesosternum.

8. *Mesochorus hashimotoi* sp. nov. (Figs. 4, 12, 29 & 46)

♀. Face about 1.3 times as wide as high, strongly and rather densely punctate, the punctures a little sparser laterally; lower 1/2 of facial orbit strongly and obliquely striate; upper transverse carina of face moderately strongly dipped downward at the center; clypeus almost flat, with large, sparse, setiferous punctures, the apical margin weakly convex and thick; malar space strongly and vertically striate, 5/8–2/3 as long as basal width of mandible; mandible (Fig. 4) stout, slightly tapering towards apex, 1.8–1.9 times as long as its basal width, the lower tooth clearly longer than the upper one; temple strongly and rather sparsely punctate, 1/2–3/5 as long as eye in lateral view; occipital carina strong laterally, absent dorsally; distance between lateral ocelli and eyes about 1.5 times as long as diameter of an ocellus; frons polished, weakly convex medially, with weak sparse punctures. Antenna 1.3–1.6 times as long as forewing, with 42 or 43 segments; 1st flagellar segment 1.8–1.9 times as long as the 2nd. Pronotum weakly and sparsely punctate wholly; Mesoscutum moderately strongly and densely punctate, the punctures weaker and sparser laterally and posteriorly; notaulus slightly impressed, reaching to the center; prescutellar transverse groove polished, bare; scutellum moderately strongly convex, with very sparse and weak punctures, the apical portion not specialized; mesopleurum very sparsely and strongly punctate largely, weakly and densely punctate just below the subtegular ridge; prepectus finely and sparsely punctate; mesosternum finely and rather densely punctate; metapleurum with weak, rather sparse punctures. Propodeum (Fig. 12) distinctly areolated, rather sparsely haired, the basal area and areola virtually bare; areola 1.4–1.6 times as long as wide at costula, with costula originating from basal 1/3–1/2; propodeal spiracle large, subcircular, closer to pleural carina than to lateral longitudinal carina. Hind femur 4.3–4.5 times as long as wide in lateral view; hind metatarsus 2.7–2.9 times as long as 2nd tarsal segment; tarsal claws weakly pectinate at base, hind ones each with 2 or 3 weak teeth. Wings (Figs. 29 & 46) with nervulus postfurcal by 3/8–1/2 of its own length; stigma small, 3.5–3.9 times as long as wide, with radius emitting from basal 5/7; areolet receiving 2nd recurrent vein a little basad of the middle; 3rd abscissa of discoideus 2.2–2.5 times as long as the 2nd; nervellus rather strongly reclivous, 1.4–1.5 times as long as intercubittella; apex of costella with 1 hamulus; metacarpella with 5, sometimes 6 hamuli. Abdomen polished; 1st tergite very sparsely haired, 3.1–3.4 times as long as wide at apex; postpetiole 1.4–1.7 times as long as wide at apex; 2nd

tergite about 1.1 times as long as wide at apex, about 1.1 times as long as the 3rd, with short, very sparse hairs; 3rd and following tergites virtually bare, the lateral sides of 4th and 5th tergites sparsely haired. Subgenital plate mostly bare, with sparse hairs on base and along ventral margin; ovipositor sheath rather narrow, 9.0-10.7 times as long as wide and about 1/2 as long as hind tibia, densely haired on basal 1/3, very sparsely haired on apical 2/3.

Stramineous to fulvous. Apical teeth of mandible dark brown to ferruginous; frons yellowish brown laterally, dark brown to blackish medially; ocellar area, vertex, occiput and dorsal part of postocciput dark brown. Antennae infusate, a little paler basally. Mesoscutum black, with a pair of yellowish brown stripes along notaulus, the stripe sometimes indistinct, and sometimes entirely black; prescutellar transverse groove dark brown to black; scutellum yellowish brown, sometimes dark brown basally; mesopleurum yellowish brown, the anterior margin sometimes weakly tinged with dark brown. Propodeum fulvous, the basal area, 1st lateral area, basal part of 2nd lateral area and areola more or less tinged with dark brown, sometimes entirely light yellowish brown. Hind leg yellowish brown to ferruginous; coxa with a wide apical dark brown band; basal 1/6-2/7 and apical 2/9-3/8 of hind tibia dark brown to blackish. First tergite black, with a yellowish brown marking on posterior portion, the basodorsal portion tinged with yellowish brown; 2nd tergite black laterally, yellowish brown medially, the basomedian portion sometimes black; 3rd and following tergites yellowish brown to ferruginous, sometimes the lateral sides and apices dark brown. Ovipositor sheath dark brown, a little paler apically. Wings hyaline; stigma infusate.

Length: Body 5.3-5.8 mm., forewing 4.7-5.3 mm.

♂. Differs from female as follows: —

Mandible 1.8-2.1 times as long as its basal width; facial orbit very finely and obliquely striate; distance between lateral ocelli and eyes 1.6-1.7 times as long as diameter of an ocellus; antennae with 39-41 segments; 1st flagellar segment 1.6-1.8 times as long as the 2nd. Propodeum with petiolar area 1.3-1.4 times as long as wide; basal area sometimes confluent with 1st lateral area. Metatarsus of hind leg 2.8-3.0 times as long as 2nd tarsal segment; tarsal claws simple. First tergite 2.9-3.1 times as long as wide at apex; 2nd tergite 0.9-1.0 times as long as wide at apex; clasper about 4/7 as long as hind tibia.

In colouration similar to female. Occiput with a dark brown band along occipital carina; scutellum light yellowish brown, with a large dark brown marking; mesoscutum entirely black; propodeum fulvous, the basal area, 1st and 2nd lateral areas and areola black; 1st tergite more extensively black; 2nd tergite black, with a large triangular marking on posterior portion; 3rd tergite blackish, with a basomedian yellowish marking; 4th and following tergites fulvous, dark brown dorsally.

Length: Body 6.0-6.9 mm., forewing 5.1-5.5 mm.

This species is variable in colouration. In general, specimens from Formosa are darker, with the frons yellowish brown laterally, dark brown to blackish medially, the vertex dark brown, the dorsal area of occiput and postocciput more extensively

darkened, while specimens from Japan are paler, with the frons and vertex except for ocellar area light yellowish brown, the dorsal area of occiput weakly tinged with dark brown along occipital carina, the propodeum sometimes entirely light yellowish brown. In one specimen (♀, 18-iv-1981) from Formosa the 2nd tergite was largely black, with a large, triangular subapical yellowish brown marking, the 3rd tergite yellowish brown, dark brown laterally and apicodorsally, the 4th and 5th tergites dark brown dorsally.

Holotype. ♀, Japan: Kagoshima-shi, Kyushu, 22-v-1963, K. Hashimoto leg. Paratypes. Formosa: 1♀, 18-iv-1981, Hsitsun-Chihtuan, 1000–1200 m, Taoyuan Hsien, K. Ôhara leg.; 1♀, 23-iv-1981, Nanshanchi, 650–700 m, Nantou Hsien, H. Takemoto leg. Japan: 2♂♂, 20-vii- & 9-ix-1965, Sapporo, Hokkaido, K. Kusigemati leg.; 1♀, 7-vii-1966, Nukabira, Hokkaido, K. Kusigemati leg.; 1♀, 23-v-1969, Kurino-dake, Kagoshima-ken, K. Kusigemati leg.; 1♂, 4-viii-1970, Shiiba, Miyazaki-ken, A. Nagatomi leg.; 1♂, 11-vi-1975, Takachihono-mine, Kagoshima-ken, T. Shiba leg.

Distribution: Formosa and Japan (Hokkaido; Kyushu).

This species is extremely allied to the Palearctic *M. furgurans* Curtis, 1833, but it differs from the latter by the postfurcal nervulus, the absence of the occipital carina on the dorsal area, and the infusate stigma.

9. *Mesochorus takizawai* sp. nov. (Figs. 16, 30 & 47)

♀. Face 1.4 times as wide as high, weakly and rather sparsely punctate, the punctures sparser laterally and dorsally; lower half of facial orbit rather strongly and obliquely striate; upper transverse carina of face almost straight, weakly dipped downward at the center; clypeus almost flat, with large, sparse, setiferous punctures, the apical margin thick and weakly convex; malar space as long as basal width of mandible; mandible rather strongly tapering towards apex, short, about 1.6 times as long as its basal width, finely and transversely striate on basal 1/2, the apical teeth approximately equal in length; temple moderately strongly punctate, 3/5 as long as eye in lateral view; frons polished, weakly rugulo-punctate; occipital carina weak but complete; distance between lateral ocelli and eyes about 1.8 times as long as diameter of an ocellus. Antenna about 1.4 times as long as forewing, with 33 segments; 1st flagellar segment about 1.6 times as long as the 2nd. Pronotum weakly and rather sparsely punctate, the punctures weaker and sparser ventrally; mesoscutum moderately strongly and densely punctate, the punctures a little weaker and sparser laterally and posteriorly; prescutellar transverse groove bare; scutellum rather weakly convex, very sparsely and finely punctate, the apical portion not specialized; mesopleurum strongly and rather sparsely punctate, the punctures sparser medially; metapleurum finely and densely punctate. Propodeum (Fig. 16) distinctly areolated, moderately densely haired wholly; areola about 1.4 times as long as wide at costula, with costula originating from basal 1/2; basal area very small, with a long stalk on posterior

margin; petiolar area about 1.4 times as long as wide and about 1.4 times as long as areola; propodeal spiracle large, circular, situated at equal distance of pleural and lateral longitudinal carinae. Hind femur stout, 4.0 times as long as wide in lateral view; hind metatarsus 2.5 times as long as 2nd tarsal segment; tarsal claws rather strongly pectinate at base, hind ones each with 3 or 4 teeth. Wings (Figs. 30 & 47) with nervulus postfurcal by $4/7$ of its own length; areolet receiving 2nd recurrent vein at the middle; stigma about 3.7 times as long as wide, with radius emitting from basal $2/3$; 3rd abscissa of discoideus 2.8 times as long as the 2nd; nervellus slightly reclivous, 1.6 times as long as intercubittella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished; 1st tergite about 2.8 times as long as wide at apex, with a few short hairs; postpetiole about 1.2 times as long as wide at apex; 2nd tergite $4/5$ as long as wide at apex and about 1.5 times as long as the 3rd, virtually bare; 4th and following tergites virtually bare, the lateral side of each tergite sparsely haired. Subgenital plate polished, almost bare, with a few hairs along ventral margin; ovipositor sheath moderately wide, 10.8 times as long as wide, $5/8$ as long as hind tibia, rather densely haired on about $1/3$, very sparsely haired on about apical $2/3$.

Pale yellow to fulvous. Mandibular teeth, median longitudinal band of frons, ocellar area, dorsal areas of occiput and postocciput dark brown. Antennae fuscous, darker apically. Mesoscutum with three blackish longitudinal bands, the median one reaching to basal $1/2$; mesopleurum except for posterior margin, speculum and mesosternum dark brown to blackish; metapleurum tinged with dark brown, darker medially. Propodeum yellowish brown, the areola, 1st lateral area, and basal $1/2$ of 2nd lateral area dark brown to blackish. Hind coxa with a dark brown apicodorsal band; lateral side of femur a little darker; basal $1/6$ and apical $2/7$ of hind tibia infuscate; tarsi fulvous to fuscous. First tergite black, the basal $2/9$ and extreme apex light yellowish brown; 2nd tergite blackish, with a large, triangular, subapical yellowish brown marking; 3rd tergite dark brown, light yellowish brown basomedially; 4th and following tergites light yellowish brown, the posterodorsal part of each tergite dark brown; subgenital plate light yellowish brown; ovipositor sheath fuscous, a little darker basally. Wings subhyaline, stigma fuscous.

Length: Body 4.5 mm., forewing 3.8 mm.

♂. Differs from female as follows: —

Face 1.3 times as wide as high; malar space $5/7$ as long as basal width of mandible; distance between lateral ocelli and eyes 1.3 times as long as diameter of an ocellus; frons polished, impunctate medially, weakly and sparsely punctate laterally. Antenna 1.5 times as long as forewing, with 37 segments; 1st flagellar segment about 1.8 times as long as the 2nd. Stigma 3.3 times as long as wide, with radius emitting from basal $3/4$; nervellus about 1.5 times as long as intercubittella; 3rd abscissa of discoideus about 2.3 times as long as the 2nd. First abdominal tergite 3.2 times as long as wide at apex; 2nd tergite 1.1 times as long as wide at apex and 1.1 times as long as wide in lateral view; hind metatarsus 2.0 times as long as 2nd tarsal segment; tarsal claws simple. Clasper $2/5$ as long as hind tibia.

Occiput more extensively darkened; median longitudinal band of mesoscutum reaching to apex of mesoscutum; scutellum yellowish brown, with a large basomedian dark brown marking; wing concavities dark brown; propodeum with areola, 1st and 2nd lateral areas, basal part of 1st pleural area dark brown to blackish, elsewhere light yellowish brown, the 1st lateral area with a yellowish brown spot; metapleurum darker than in female.

Length: Body 4.5 mm., forewing 4.3 mm.

Holotype. ♀, Japan: Yona, Kunigami, Okinawa-jima, Ryukyu Is., 5-v-1976, H. Takizawa leg. Paratype. Formosa: 1♂, 27-iv-1981, Jihyetan, 750 m, Nantou Hsien, H. Takemoto leg.

Distribution: Formosa and Japan (Ryukyu Is.).

This species resembles the Palearctic species *M. vittator* (Zetterstedt, 1838), but it can be easily distinguished from the latter by the transversely striate mandible, the complete occipital carina, the postfurcal nervulus, the infusate stigma, the black mesopleurum, and the bicoloured propodeum.

10. *Mesochorus dentus* sp. nov. (Figs. 14, 31 & 48)

♀. Face 1.2 times as wide as high, weakly and rather densely punctate, the lower lateral corner finely and obliquely striate; upper transverse carina of face rather weakly dipped downward at the center; clypeus almost flat, with sparse, setiferous punctures, the apical margin thick and subtruncate; malar space $\frac{4}{5}$ as long as basal width of mandible; mandible rather slender, weakly tapering towards apex, about 1.5 times as long as its basal width, the apical teeth equal in length; frons polished, finely and rather sparsely punctate laterally and dorsally; temple finely and densely punctate, $\frac{1}{2}$ as long as eye in lateral view; occipital carina weak but complete; distance between lateral ocelli and eyes 1.2 times as long as diameter of an ocellus. Antenna 1.2 times as long as forewing, with 34 segments; 1st flagellar segment 1.1 times as long as the 2nd. Pronotum finely and densely punctate wholly; mesoscutum finely and densely punctate, the punctures a little coarser posteromedially; notaulus obsolete; prescutellar transverse groove sparsely haired; scutellum weakly convex, sparsely haired, the apical portion not specialized; mesopleurum polished, sparsely punctate, the punctures denser anterodorsally, the specillum impunctate; metapleurum with rather sparse, fine, setiferous punctures. Propodum (Fig. 14) polished, rather sparsely haired, and distinctly areolated; basal area narrow, with a short stalk on posterior margin; areola 1.9 times as long as wide at costula, with costula originating from basal $\frac{1}{3}$; petiolar area about as long as wide and $\frac{2}{3}$ as long as areola; propodeal spiracle small, circular, touching the pleural carina. Hind femur 5.1 times as long as wide in lateral view; hind metatarsus 2.4 times as long as 2nd tarsal segment; tarsal claws weakly pectinate at base, hind ones each with a long tooth. Wings (Figs. 31 & 48) with nervulus postfurcal by $\frac{1}{6}$ of its own length; stigma large, 3.4 times as long as wide, with radius emitting from basal $\frac{5}{7}$; areolet receiving 2nd recurrent vein a little basad

of the middle; 3rd abscissa of discoideus 2.6 times as long as the 2nd; nervellus rather strongly reclivous, 1.8 times as long as intercubitella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished; 1st tergite very sparsely haired, 3.1 times as long as wide at apex; postpetiole finely and longitudinally striate, 1.3 times as long as wide at apex; 2nd and subsequent tergites virtually bare dorsally, sparsely punctate laterally; 2nd tergite 0.9 times as long as wide at apex and about 1.2 times as long as the 3rd. Subgenital plate largely hairless, the basal part sparsely haired; ovipositor sheath comparatively wide, 6.6 times as long as wide, about 1/2 as long as hind tibia, and densely haired wholly.

Fulvous, with blackish markings. Mandibular teeth, ocellar area, median longitudinal band of frons, postocciput except for lower portion, and dorsolower half of occiput dark brown. Antennae fuscous, a little paler basoventrally. Pronotum yellowish brown dorsally, dark brown ventrally; mesoscutum with 3 longitudinal dark brown bands, the median one extending to basal 1/5 of median lobe; meso- and metapleurum almost entirely dark brown to blackish; upper division of metapleurum dark brown. Hind coxa yellowish brown, the apicodorsal 1/2 and inner lateral side dark brown, the extreme base and apical 2/9 infuscate, with a small infuscate spot on basolateral area; tarsi fulvous to fuscous. First tergite dark brown, the base fusco-fulvous, and the median portion of postpetiole tinged with reddish brown; 2nd tergite dark brown, paler medially, with a narrow yellowish brown apical band; 3rd tergite dark brown basolaterally, fulvous apicomediaally; 4th and following tergites fulvous dorsally, dark brown laterally; subgenital plate fulvous; ovipositor sheath fuscous, a little paler apically. Wings hyaline; stigma fuscous on median 2/5, pale on basal 2/5 and apical 1/5.

Length: Body 4.2 mm., forewing 4.5 mm.

♂. Unknown.

Holotype. ♀, Formosa: Meifeng-Tsuifeng, 2200-2300 m, Nantou Hsien, 16-17-iv-1981, K. Ôhara leg.

Distribution: Formosa.

In general structures this new species resembles most closely *M. takizawai* sp. nov., from which it differs clearly by the densely haired ovipositor sheath, the strongly reclivous nervellus, the comparatively short 1st flagellar segment, the entirely yellowish brown propodeum with narrow areola, and the propodeal spiracle which is small, touching to the pleural carina.

11. *Mesochorus taiwanensis* sp. nov. (Figs. 19, 32 & 49)

In general structures this new species resembles most closely *M. dentus* sp. nov., from which it differs clearly by the following characters: —

♀. Face about 1.3 times as wide as high, a little more strongly punctate than in that of *dentus*; distance between lateral ocelli and eyes about 1.5 times as long as diameter of an ocellus. Antenna with 36 segments; 1st flagellar segment about 1.6

times as long as the 2nd. Propodeum (Fig. 19) with areola about 1.5 times as long as wide at costula and about as long as petiolar area; propodeal spiracle small, circular, closer to lateral longitudinal carina than to pleural carina. Wings (Figs. 32 & 49) with nervulus postfurcal by about 1/2 of its own length; nervellus weakly reclivous, 1.4 times as long as intercubittella; hind metatarsus 2.5 times as long as 2nd tarsal segment; tarsal claws weakly pectinate, hind ones each with 2 small teeth. Postpetiole 1.4 times as long as wide at apex; 2nd tergite about as long as wide at apex; ovipositor sheath 9.0 times as long as wide, 5/9 as long as hind tibia, very sparsely haired, the hairs a little denser basally.

Fulvous, with blackish markings. Antennae fuscous. Mesoscutum yellowish brown, with 3 longitudinal dark brown bands, the median one reaching to basal 1/2 of median lobe; prescutellar transverse groove dark brown; propodeum with a pair of dark brown bands along lateral areas. Hind coxa light yellowish brown, dark brown dorsally, a little paler on inner basodorsal portion; hind femur fuscous, a little paler basally; hind tibia pale yellow on median 1/3, infuscate on basal and apical 1/3; tibial spurs fuscous to infuscate; hind tarsus infuscate, paler basally. Third and following tergites a little darker than in those of *dentus*. Wings hyaline; stigma entirely fuscous.

Length: Body 3.7 mm., forewing 3.7 mm.

♂. Differs from female as follows: —

Face more weakly and sparsely punctate than in female; antenna with 30 segments. Stigma 3.7 times as long as wide; nervellus 2.0 times as long as intercubittella. First tergite slender, 3.9 times as long as wide at apex; postpetiole 1.7 times as long as wide at apex; 2nd tergite 1.2 times as long as wide at apex and 1.3 times as long as the 3rd. Hind femur 4.3 times as long as wide in lateral view; clasper about 1/2 as long as hind tibia, the apex rounded. Occiput slightly tinged with dark brown; mesopleurum fulvous; mesosternum weakly tinged with dark brown. Propodeum almost entirely fulvous, the extreme base blackish; clasper fulvous.

Length: Body 3.3 mm., forewing 3.3 mm.

Holotype. ♀, Formosa: Hsitsun-Chihtuan, 1000–1200 m, Taoyuan Hsien, 18-iv-1981, H. Takemoto leg. Paratype. Formosa: 1♂, 27-iv-1981, Jihyetan, 750 m, Nantou Hsien, H. Takemoto leg.

Distribution: Formosa.

Furthermore, this species is similar to the Holarctic and Oriental *M. discitergus* (Say, 1836), from which it is readily distinguished by the subvertical nervellus, the propodeal spiracle which is closer to the longitudinal carina than to the pleural carina, the infuscate stigma and the hind tibia with wide basal and apical infuscate bands.

12. *Mesochorus microbathros* sp. nov. (Figs. 18, 33 & 50)

♀. Face 1.1 times as wide as high, moderately strongly and densely punctate, the punctures a little sparser and weaker laterally and dorsally; lower lateral half of facial

orbit weakly and obliquely striate; upper transverse carina of face weakly dipped downward at the center; clypeus slightly convex, the apical margin thick and weakly convex; malar space $3/4$ as long as basal width of mandible; mandible short, rather strongly tapering towards apex, 1.6 times as long as its basal width, weakly and transversely striate, the apical teeth equal in length; temple narrow, $5/9$ as long as eye in lateral view, weakly and rather sparsely punctate; occipital carina weak, with a narrow interruption on the median dorsal portion; frons almost flat, polished, almost entirely bare, with sparse hairs along frontal orbit; distance between lateral ocelli and eyes about 1.8 times as long as diameter of an ocellus. Antenna short, about 1.1 times as long as forewing, with 33 segments; 1st flagellar segment 1.9 times as long as the 2nd. Pronotum finely and rather sparsely punctate wholly; mesoscutum finely and densely punctate, the punctures becoming coarser posteromedially; notaulus obsolete; prescutellar transverse groove sparsely haired; scutellum weakly convex, sparsely haired, the apical part not specialized; mesopleurum weakly and densely punctate anteriorly, very sparsely punctate posteriorly; metapleurum with sparse, weak, setiferous punctures. Propodeum (Fig. 18) polished, strongly areolated, with rather sparse, fine, setiferous punctures; basal area very narrow, the posterior margin pointed; areola long, 2.5 times as long as wide at costula, with costula originating from basal $1/3$; petiolar area short, $8/9$ as long as wide and $5/7$ as long as areola; propodeal spiracle small, circular, closer to pleural carina than to lateral longitudinal carina. Hind femur rather stout, 4.5 times as long as wide in lateral view; hind metatarsus about 2.6 times as long as 2nd tarsal segment; tarsal claws moderately strongly pectinate at base, hind ones each with 3 or 4 short strong teeth. Wings (Figs. 33 & 50) with nervulus postfurcal by $4/9$ of its own length; stigma small, 3.8 times as long as wide, with radius emitting from basal $2/3$; areolet receiving 2nd recurrent vein at the middle; 3rd abscissa of discoideus 1.8 times as long as the 2nd; nervellus weakly reclivous, about 1.5 times as long as intercubittella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished; 1st tergite 3.1 times as long as wide at apex, with a few short hairs; postpetiole 1.4 times as long as wide at apex; 2nd tergite almost entirely bare, with short, scattered hairs, about as long as wide at apex and about 1.2 times as long as the 3rd; 3rd and following tergites virtually bare, sparsely haired on each lateral side. Subgenital plate with long sparse hairs; ovipositor sheath moderately wide, 6.9 times as long as wide, about $4/9$ as long as hind tibia, and rather densely haired wholly.

Black. Face, clypeus, malar space, mouth part except ferruginous apical teeth, frontal orbit, outer orbit, and lower half of temple light yellowish brown to yellowish brown; frons except for orbital area, ocellar area, vertex, occiput, dorsal $1/2$ of temple and postocciput dark brown to blackish. Antennae fuscous, a little paler basoventrally. Tegula, subtegular ridge, posterodorsal corner and anterior margin of pronotum pale yellow; propleurum dark brown, pale yellow on apical margin; subtegular ridge and anterior margin of mesopleurum weakly tinged with dark brown. First tergite black, the basal portion slightly tinged with dark brown, with narrow yellowish brown band at apex; 2nd tergite black, light yellowish brown on apical $1/5$; 3rd tergite light

yellowish brown medially and posteriorly, dark brown basolaterally; 4th and 5th tergites dark brown to light yellowish brown, paler apically; 6th and following tergites dark brown. Subgenital plate light yellowish brown; ovipositor sheath fuscous, paler apically. Wings hyaline, stigma light fuscous.

Length: Body 4.3 mm., forewing 4.2 mm.

♂. Differs from female as follows: —

Face about 1.3 times as wide as high; distance between lateral ocelli and eyes about 1.5 times as long as diameter of an ocellus; antenna 1.2–1.4 times as long as forewing, with 34–36 segments; 1st flagellar segment 1.6 times as long as the 2nd. Wings with nervulus postfurcal by $2/5$ – $4/9$ of its own length; stigma 3.6 times as long as wide; 3rd abscissa of discoideus 1.5 times as long as the 2nd; nervellus about 1.7 times as long as intercubitella. Propodeum with basal area narrow, the posterior margin truncate; areola about 2.2 times as long as wide at costula. Hind femur 4.8–4.9 times as long as wide in lateral view; tarsal claws simple. First tergite 2.9 times as long as wide at apex; clasper about $5/9$ as long as hind tibia, the apex rounded. Hind coxa, femur, tibia, tarsus, and 3rd and subsequent tergites a little darker than in female.

Length: Body 5.1–5.3 mm., forewing 4.3–4.8 mm.

Holotype. ♀, Formosa: Hsitsun-Chihtuan, 1000–1200 m, Taoyuan Hsien, 18-iv-1981, H. Takemoto leg. Paratypes. Formosa: 1♂, 17-iv-1981, Mt. Lalashan, 1300–1500 m, Taoyuan Hsien, H. Takemoto leg.; 1♂, 18-iv-1981, Hsitsun-Chihtuan, 1000–1200 m, Taoyuan Hsien, K. Ôhara leg.

On account of the infusate stigma and the frons which is weakly punctate on the lateral area, impunctate on the median area, and with a median pit at the bottom, this species is very closely related to *M. interstitialis* sp. nov. and *M. stigmatus* sp. nov. The present species is clearly distinguished from *interstitialis* in having the postfurcal nervellus, the comparatively short 3rd abscissa of the discoideus, the weakly reclivous nervellus, and from *stigmatus* in having the comparatively slender stigma, the striate postpetiole and mandible, and the yellowish brown frontal and tempolar orbits.

13. *Mesochorus interstitialis* sp. nov. (Figs. 6, 15, 34 & 51)

In general structures and colouration this new species is very similar to *M. microbathros* sp. nov., from which it differs readily by the following characters: —

♂. Face about 1.2 times as wide as high, a little more weakly punctate than in that of *microbathros*, the lower lateral corner finely and obliquely striate; malar space $3/5$ as long as basal width of mandible; mandible (Fig. 6) stout, rather strongly tapering towards apex, 1.5 times as long as its basal width, not striate, the apical teeth equal in length; distance between lateral ocelli and eyes 1.7 times as long as diameter of an ocellus. Antenna about 1.4 times as long as forewing, with 35 segments; 1st flagellar segment 1.5 times as long as the 2nd. Mesopleurum a little more densely haired than in that of *microbathros*. Propodeum (Fig. 15) with basal area small, with a long stalk on posterior margin; areola 2.1 times as long as wide at costula, with costula originat-

ing from basal $2/9$; petiolar area 1.1 times as long as wide and $3/5$ as long as areola. Wings (Figs. 34 & 51) with nervulus interstitial; stigma 4.1 times as long as wide; 3rd abscissa of discoideus 3.2 times as long as the 2nd; nervellus strongly reclivous, about 1.5 times as long as intercubitella. Hind femur 5.1 times as long as wide in lateral view; hind metatarsus 2.4 times as long as 2nd tarsal segment; tarsal claws not pectinate. First tergite 3.1 times as long as wide at apex; 2nd tergite 1.2 times as long as wide at apex and about 1.3 times as long as the 3rd; clasper about $4/9$ as long as hind tibia, the apex rounded.

In colouration very similar to *microbathros* except the following portions: Pronotum more extensively yellowish brown; scutellum slightly tinged with dark brown; hind leg and dorsal sides of 3rd and subsequent tergites paler; clasper fulvous.

Length: Body 4.0 mm., forewing 3.8 mm.

♀. Unknown.

Holotype. ♂, Formosa: Hsitsun-Chihtuan, 1000-1200 m, Taoyuan Hsien, 18-iv-1981, H. Takemoto leg.

This species is most closely related to *M. microbathros* sp. nov., from which it differs by the interstitial nervulus, the strongly reclivous nervellus, the unstriated mandible, etc. as mentioned in the key.

14. *Mesochorus stigmatus* sp. nov. (Figs. 23, 35 & 52)

♂. Face 1.4 times as wide as high, weakly and densely punctate; facial orbit not striate; upper transverse carina of face moderately strongly dipped downwards at the center; clypeus slightly convex, with sparse, large, setiferous punctures, the apical margin thick and subtruncate; malar space $5/9$ as long as basal width of mandible; mandible rather stout, weakly tapering towards apex, not striate, about 1.9 times as long as its basal width, the apical teeth equal in length; frons polished, impunctate medially, finely and sparsely punctate laterally, with a deep pit at bottom; distance between lateral ocelli and eyes about 1.6 times as long as diameter of an ocellus; temple weakly and rather sparsely punctate, $5/8$ as long as eye in lateral view; occipital carina weak but complete, the median dorsal portion weakly arched downwards. Antenna about 1.3 times as long as forewing, with 35 segments; 1st flagellar segments about 1.7 times as long as the 2nd. Pronotum densely to sparsely haired, the hairs sparser posteriorly; mesoscutum finely and densely punctate, the punctures stronger posteromedially; notaulus obsolete; prescutellar transverse groove sparsely haired; scutellum moderately strongly convex, sparsely and weakly punctate, the apical portion not specialized; mesopleurum virtually bare largely, the anterior and dorsal margins rather densely haired; metapleurum with rather dense, fine, setiferous punctures. Propodeum (Fig. 23) distinctly areolated, rather sparsely haired; areola about 1.6 times as long as wide at costula, with costula originating from basal $2/5$; petiolar area 0.9 times as long as wide and about as long as areola; basal area very small, with a long stalk on posterior margin; propodeal spiracle small, circular, touching pleural

carina. Hind femur 4.8 times as long as wide in lateral view; hind metatarsus 2.3 times as long as 2nd tarsal segment; tarsal claws rather strongly pectinate, hind ones each with 3-5 rather strong teeth. Wings (Figs. 35 & 52) with stigma very large, 3.1 times as long as wide, with radius emitting from basal 5/9; nervulus postfurcal by about 1/3 of its own length; 3rd abscissa of discoideus 1.6 times as long as the 2nd; nervellus subvertical, 1.7 times as long as intercubitella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished; hair arrangement of abdominal tergites similar to *microbathros*; 1st tergite 3.0 times as long as wide at apex; postpetiole about 1.5 times as long as wide at apex, not striate; 2nd tergite 0.9 times as long as wide at apex and 1.1 times as long as the 3rd; clasper about 2/5 as long as hind tibia, the apex rounded.

Black. Face, clypeus, mandible except for dark brown apical teeth, lower half of temple, scape, pedicel, and lower part of postocciput yellowish brown; flagellum fuscous, paler basally; frons, dorsal half of temple, vertex, ocellar area and dorsal area of occiput dark brown; palpi and tegula pale yellow. Propleurum and subtegular ridge light yellowish brown; pronotum yellowish brown, darker dorsally; anterior and anterodorsal corners of mesopleurum tinged with yellowish brown. Front and middle legs pale yellow to light yellowish brown. Hind leg with coxa yellowish brown, paler ventrally; trochanter light yellowish brown; femur yellowish brown; tibia pale yellow, fuscous at both ends; tarsus yellowish brown, a little darker apically. Abdominal tergite dark brown to blackish; extreme apex of 1st tergite, about apical 1/6 of 2nd tergite, and clasper pale yellow. Wings hyaline; stigma fuscous.

Length: Body 3.6 mm., forewing 3.5 mm.

♀. Holotype. ♂, Formosa: Mt. Lalashan, 1300-1500 m, Taoyuan Hsien, 17-iv-1981, K. Ôhara leg.

This species is very closely related to *M. microbathros* sp. nov., in its postfurcal nervulus, the subvertical nervellus, the frons with a pit at the bottom, but is distinguished at once from that species by the comparatively large stigma, the unstriated mandible, and the colourations of frons and temple.

15. *Mesochorus instriatus* sp. nov. (Figs. 3, 21, 36 & 53)

♀. Face about 1.3 times as wide as high, strongly and rather densely punctate, the punctures sparser and weaker laterally and dorsally; upper transverse carina of face weak, weakly dipped downward at the center; facial orbit not striate; clypeus almost flat, with a few large, setiferous punctures, the apical margin blunt and slightly convex; malar space weakly striate, long, 1.0 times as long as basal width of mandible; mandible (Fig. 3) short, moderately strongly tapering towards apex, about 1.4 times as long as its basal width, the lower tooth clearly longer than the upper; temple weakly and sparsely punctate, about 4/7 as long as eye in lateral view; distance between lateral ocelli and eyes 1.5 times as long as diameter of an ocellus; frons polished, very sparsely haired, the hairs denser laterally; occipital carina weak laterally, absent

dorsally. Antenna about 1.3 times as long as forewing, with 31 segments; 1st flagellar segment 1.6 times as long as the 2nd. Pronotum moderately densely and finely punctate, the punctures a little sparser posteromedially; mesoscutum finely and densely punctate, the punctures stronger posterocentrally; prescutellar transverse groove with sparse hairs; scutellum weakly convex, with sparse, fine, setiferous punctures, the apical portion not specialized; mesopleurum sparsely punctate, the punctures denser anteriorly and dorsally; prepectus finely punctate; mesosternum moderately densely haired; metapleurum with moderately dense, fine, setiferous punctures. Propodeum (Fig. 21) sparsely haired wholly, distinctly areolated; basal area large, the posterior margin truncate; areola about 1.4 times as long as wide at costula, with costula originating from basal $1/2$; petiolar area about 1.4 times as long as wide and about 1.4 times as long as areola; propodeal spiracle small, circular, situated equidistant from pleural and lateral longitudinal carinae. Hind femur 4.8 times as long as wide in lateral view; hind metatarsus about 2.5 times as long as 2nd tarsal segment; tarsal claws weakly pectinate, hind ones each with 1 strong tooth. Wings (Figs. 36 & 53) with nervulus postfurcal by $3/8$ of its own length; stigma 3.4 times as long as wide, with radius emitting from basal $4/7$; areolet receiving 2nd recurrent vein a little basad of the middle; 3rd abscissa of discoideus about 1.8 times as long as the 2nd; nervellus rather strongly reclivous, about 1.8 times as long as intercubittella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished, virtually bare; 1st tergite about 3.2 times as long as wide at apex; postpetiole about 1.4 times as long as wide at apex; 2nd tergite 0.9 times as long as wide at apex and about 1.2 times as long as the 3rd. Subgenital plate with very sparse hairs; ovipositor sheath rather narrow, 10.0 times as long as wide and $5/8$ as long as hind tibia, rather sparsely haired, the hairs denser basally.

Black. Head yellowish brown; face except for facial orbit dark brown; clypeus dark brown, a little paler laterally; mandibular teeth light yellowish brown; frons dark brown centrally; ocellar area, dorsal half of postocciput and occiput dark brown. Antennae fuscous, a little paler basoventrally. Propleurum dark brown, the apical margin light yellowish brown; pronotum dark brown, paler dorsally and posteriorly, the collar area yellowish brown; tegula and subtegular ridge light yellowish brown; mesopleurum, metapleurum, and propodeum black. Front and middle legs pale yellow to light yellowish brown. Hind leg light yellowish brown to fulvous; coxa and femur a little darker; tibia with basal and apical infuscate bands; tarsus fuscous, paler basally. First tergite black, yellowish brown at base; 1st sternite light yellowish brown; 2nd tergite black, with a triangular, yellowish brown posteromedian band; 3rd tergite yellowish brown basomedially, dark brown apically and laterally; 4th to 6th tergites dark brown. Subgenital plate light yellowish brown; ovipositor sheath fuscous. Wings hyaline; stigma stramineous.

Length: Body 3.6 mm., forewing 3.3 mm.

♂. Unknown.

Holotype. ♀, Formosa: Hsitsun-Chihtuan, 1000-1200 m, Taoyuan Hsien,

18-iv-1981, H. Takemoto leg.

Distribution: Formosa.

This species is similar to *M. hashimotoi* sp. nov., from which it is immediately distinguished by the flagellum with 31 segments, the sparsely and weakly punctate temple, the small mandible, the facial orbit which is not striate, the black mesosternum, meso- and metapleurum. Further, it is closely allied to *M. monomaculatus* sp. nov., but it differs from the latter by the occipital carina with a wide dorsal interruption, the lower tooth of the mandible which is clearly longer than the upper one, the largely dark brown face, the hind tibia without a basolateral blackish spot.

16. *Mesochorus monomaculatus* sp. nov. (Figs. 20, 37 & 54)

♀. Face 1.2–1.3 times as wide as high, weakly and rather densely punctate; upper transverse carina of face rather strongly dipped downward at the center; lower 1/2, sometimes entire surface of facial orbit weakly and obliquely striate; clypeus almost flat, with large, sparse, setiferous punctures, the apical margin blunt and slightly convex; malar space 0.9–1.0 times as long as basal width of mandible; mandible moderately stout, rather strongly tapering towards apex, 1.5–1.7 times as long as its basal width, the apical teeth about equal in length; temple finely and sparsely punctate, 5/9 as long as eye in lateral view, the lower portion vertically striate as in malar space; frons almost flat, finely and rather sparsely punctate, very finely and transversely rugulose; distance between lateral ocelli and eyes 2.0–2.1 times as long as diameter of an ocellus; occipital carina weak but complete. Antenna 1.2–1.3 times as long as forewing, with 32 segments 1st flagellar segment 1.5–1.7 times as long as the 2nd. Pronotum finely and densely punctate wholly; mesoscutum with dense, fine, setiferous punctures, the punctures coarser posteromedially; prescutellar transverse groove with short sparse hairs; scutellum moderately convex, sparsely and weakly punctate, the apical portion not specialized; mesopleurum rather densely haired anteriorly and dorsally, bare centrally, very sparsely haired posteriorly; prepectus and mesosternum densely haired; metapleurum moderately densely haired. Propodeum (Fig. 20) rather sparsely haired, strongly areolated; basal area long, the posterior margin truncate; areola 1.5–1.6 times as long as wide at costula, with costula originating from basal 3/8–2/5; petiolar area about 1.1 times as long as wide and 0.9–1.1 times as long as areola; propodeal spiracle small, circular, closer to pleural carina than to lateral longitudinal carina. Hind femur slender, 4.7–4.8 times as long as wide in lateral view; hind metatarsus 2.7–2.8 times as long as 2nd tarsal segment; tarsal claws very weakly pectinate at extreme base, hind ones each with 1 or no teeth. Wings (Figs. 37 & 54) with nervulus postfurcal by 4/9–3/5 of its own length; areolet receiving 2nd recurrent vein at the middle; 3rd abscissa of discoideus 2.3 times as long as the 2nd; nervellus rather strongly reclivous, 1.7–2.1 times as long as intercubitella; apex of costella with 1 hamulus; metacarpella with 4 hamuli. Abdomen polished; abdominal tergites very sparsely haired, the lateral sides of 3rd and following tergites densely

haired; 1st tergite 2.6–2.9 times as long as wide at apex; postpetiole 1.1–1.3 times as long as wide at apex; 2nd tergite about 0.9 times as long as wide at apex and 1.2–1.3 times as long as the 3rd. Subgenital plate with scattered hairs; ovipositor sheath narrow, 10.3–10.7 times as long as wide and $4/7$ – $5/8$ as long as hind tibia, sparsely haired, the hairs a little denser basally.

Black. Head yellowish brown; face with a pair of dark brown spots just below the antennal sockets; frons except for frontal orbit, ocellar area, posterodorsal $1/2$ of temple, occiput and dorsal $1/2$ of postocciput dark brown. Apical teeth of mandible reddish brown. Antennae fuscous, a little paler basally; propleurum dark brown, the apical margin light yellowish brown; pronotum yellowish brown to dark brown, darker centrodorsally; mesopleurum largely black, the anterodorsal area and subtegular ridge yellowish brown; scutellum, postscutellum and upper division of metapleurum dark reddish brown to fuscous. Apical portion of propodeum usually tinged with reddish brown. Front and middle legs with coxae, trochanters and femora light yellowish brown; tibiae yellowish brown to light fuscous, the both ends infuscate; tarsi fuscous, darker apically; tibial spurs fuscous. Hind leg with coxa yellowish brown ventrally, dark brown to black dorsally; trochanter light yellowish brown; femur fuscous, a little paler basally and apically; tibia light yellowish brown, infuscate at base and on about apical $1/3$, with a small subbasal blackish spot on dorsal side; tibial spur fuscous; tarsus fuscous, a little paler apically. Abdomen black; 1st sternite and basal $1/4$ of 1st tergite light yellowish brown; 2nd tergite with a narrow apical yellow band; 3rd tergite with a large, triangular, yellowish brown basomedian marking. Subgenital plate light yellowish brown; ovipositor sheath fuscous, the tip yellowish brown. Wings subhyaline; stigma pale.

Length: Body 3.3–3.9 mm., forewing 3.4–4.0 mm.

♂. Differs from female as follows: —

Malar space $3/4$ as long as basal width of mandible; antenna with 33 segments. Wings with 3rd abscissa of discoideus about 1.8 times as long as the 2nd; stigma 4.4 times as long as wide; nervellus about 1.6 times as long as intercubitella. Propodeum with areola 1.7 times as long as wide at costula, with costula originating from basal $1/4$; petiolar area 0.9 times as long as wide and $3/4$ as long as areola. Hind femur 5.5 times as long as wide in lateral view; hind metatarsus 2.5 times as long as the hind 2nd one. Postpetiole about 1.4 times as long as wide at apex; clasper $1/2$ as long as hind tibia. In clouration paler than in female; dorsal spots of face indistinct.

Length: Body 4.2 mm., forewing 4.0 mm.

Holotype. ♀, Formosa: Mt. Lalashan, 1300–1500 m, Taoyuan Hsien, 17-iv-1981, H. Takemoto leg. Paratypes. Formosa: 1 ♀, 27-iv-1981, Meifeng-Tsuifeng, 2200–2300 m, Nantou Hsien, K. Ôhara leg.; 1 ♂ & 1 ♀, 13-iv-1984, Alishan-Chushan, Alishan, Chiai, K. Ôhara leg.

Distribution: Formosa.

This species is most closely related to *M. turgidus* sp. nov., but it differs from the latter by the more sparsely and weakly punctate temple, the comparatively stout 1st

tergite, the blackish mesosternum and mesopleurum, etc. as mentioned in the key.

17. *Mesochorus turgidus* sp. nov. (Figs. 22, 38 & 55)

In general structures this new species closely resembles the preceding species, *M. monomaculatus* sp. nov., from which it differs by the following characters: —

♂. Face about 1.3 times as wide as high; malar space 1.0 times as long as basal width of mandible; temple finely and sparsely punctate; frons polished, weakly and rather densely punctate, with very fine, transverse striae at bottom. Antenna about 1.4 times as long as forewing, with 31 segments. Wings (Figs. 38 & 55) with stigma 4.0 times as long as wide; 3rd abscissa of discoideus 2.3 times as long as the 2nd; nervellus weakly reclivous, about 1.8 times as long as intercubitella. Propodeum (Fig. 22) with basal area small, with a short stalk on posterior margin; areola 1.4 times as long as wide at costula, with costula originating from basal 1/4; petiolar area 1.2 times as long as areola; propodeal spiracle small, circular, closer to pleural carina than to lateral longitudinal carina. First tergite 3.1 times as long as wide at apex; postpetiole about 1.5 times as long as wide at apex and about 1.1 times as long as the 3rd; clasper about 1/2 as long as hind tibia, the apex rounded. Hind femur 5.1 times as long as wide in lateral view; hind metatarsus 2.5 times as long as 2nd tarsal segment.

Black. Head fulvous; frons except for frontal orbit, ocellar area and a dorso-median vertical band of occiput dark brown; pedicel and 1st flagellar segment fulvous; 2nd and following segments of flagellum fuscous; apical half of mandible yellowish brown. Pronotum fulvous, dark brown dorsally; mesopleurum, mesosternum, tegula, and subtegular ridge fulvous; scutellum slightly tinged with dark brown; upper division of metapleurum dark brown; metapleurum weakly tinged with yellowish brown. Front and middle legs pale yellow. Hind leg with coxa pale yellow, blackish dorsally; trochanter, femur, tibia except for both ends pale yellow; both ends of tibia infusate; basolateral marking of tibia indistinct; tarsus pale yellow to fuscous, paler basally; tibial spur fuscous. First tergite black, the base pale yellow; 1st sternite pale yellow; 2nd tergite black, pale yellow on apical 1/5; 3rd tergite black, the base tinged with yellowish brown; 4th to 6th tergites blackish; 7th tergite yellowish brown to dark brown; clasper pale yellow, the apical portion fuscous. Wings hyaline; stigma pale.

Length: Body 3.4 mm., forewing 3.5 mm.

♀. Unknown.

Holotype. ♂, Formosa: Mt. Lalashan, 1300–1500 m, Taoyuan Hsien, 17-iv-1981, H. Takemoto leg.

Distribution: Formosa.

18. *Mesochorus atricoxalis* sp. nov. (Figs. 17, 39 & 56)

♀. Face 1.3 times as wide as high, distinctly and rather sparsely punctate, the punctures sparser and weaker laterally and dorsally; upper transverse carina of face

distinct, rather strongly dipped downward at the center ; clypeus almost flat, moderately strongly and sparsely punctate, the apical margin blunt and weakly convex ; lower $1/3$ of facial orbit distinctly and obliquely striate ; malar space $8/9$ as long as basal width of mandible ; mandible short, rather strongly tapering towards apex, 1.2 times as long as its basal width, the apical teeth about equal in length ; temple narrow, finely and rather densely punctate, very weakly striate on lower corner, about $4/9$ as long as eye in lateral view ; frons subpolished, finely and rather densely punctate, with fine, transverse striae on median portion ; occipital carina distinct and complete ; distance between lateral ocelli and eyes about 1.3 times as long as diameter of an ocellus. Antenna about 1.2 times as long as forewing, with 30 segments ; 1st flagellar segment about 1.6 times as long as the 2nd. Pronotum finely and densely punctate wholly ; mesoscutum finely and densely punctate, the punctures stronger posterocentrally ; prescutellar transverse groove with sparse hairs ; scutellum weakly convex, distinctly and rather sparsely punctate, the apical portion not specialized ; mesopleurum almost entirely sparsely haired ; subtegular ridge and its lower area densely and finely punctate ; prepectus finely and densely punctate ; mesosternum densely haired ; metapleurum with distinct, moderately dense, setiferous punctures. Propodeum (Fig. 17) rather sparsely haired, distinctly and completely areolated ; basal area small, the posterior margin pointed ; areola about 1.8 times as long as wide at costula, with costula originating from basal $4/9$; petiolar area 1.1 times as long as wide and $4/5$ as long as areola ; propodeal spiracle rather large, circular, situated equidistant from pleural and lateral longitudinal carinae ; apical half of 1st pleural area very narrow, so that 2nd lateral area is very wide. Hind femur slender, 4.7 times as long as wide in lateral view, hind metatarsus 2.5 times as long as 2nd tarsal segment ; tarsal claws not pectinate. Wings (Figs. 39 & 56) with nervulus postfurcal by $4/9$ of its own length ; stigma narrow, 3.8 times as long as wide, with radius emitting from basal $5/7$; areolet receiving 2nd recurrent vein basad of the middle ; 3rd abscissa of discoideus 2.0 times as long as the 2nd ; nervellus weakly reclivous, 1.6 times as long as intercubitella, apex of costella with 1 hamulus ; metacarpella with 4 hamuli. Abdomen polished, with very sparse, short hairs ; 1st tergite about 2.8 times as long as wide at apex, the postpetiole 1.3 times as long as wide at apex ; 2nd tergite about as long as wide at apex, and about 1.1 times as long as the 3rd. Subgenital plate with very sparse hairs ; ovipositor sheath weakly upcurved, rather narrow, 7.6 times as long as wide, about $1/2$ as long as hind tibia, and sparsely haired, the hairs a little denser basally.

Black. Head yellowish brown ; face with large blackish marking along median vertical ridge ; frons blackish, the frontal orbit yellowish brown ; ocellar area, occiput, dorsal half of temple except outer orbit, occiput and dorsal half of postocciput black. Antennae infusate, a little paler basally. Propleurum dark brown, the apical part light yellowish brown ; posterodorsal corner of mesopleurum light yellowish brown. Front and middle legs pale yellow to yellowish brown, the tarsi a little darker ; extreme bases of tibiae infusate ; tibial spurs fuscous. Hind leg with coxa dark brown to black, yellowish brown on apicoventral side ; trochanter yellowish brown ; femur light

fuscous, a little paler ventrally, apically and basally; tibia light yellowish brown, infuscate on about basal 1/7 and about apical 2/9, with an indistinct dark brown marking on basolateral portion; tarsus fuscous, a little paler basally; tibial spurs fuscous. Bases of 1st tergite and 1st sternite light yellowish brown; 2nd tergite with a narrow apical yellowish brown band; 3rd tergite weakly tinged with yellowish brown basally. Subgenital plate light yellowish brown; ovipositor sheath blackish, yellowish brown at both ends. Wings hyaline; stigma stramineous.

Length: Body 4.2 mm., forewing 4.4 mm.

♂. Unknown.

Holotype. ♀, Formosa: Jumeitang, Alishan, Chiai, 14-iv-1984, K. Ôhara leg.

Distribution: Formosa.

This species is very closely allied to *M. monomaculatus* sp. nov., but it is easily distinguished from the latter by the simple tarsal claws, the comparatively long areola, with a large blackish marking on the face and the black hind coxa.

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