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H. SAUTER'S FORMOSA-COLLECTION :
SUBFAMILY *ICHNEUMONINAE* (*PIMPLINAE*
OF ASHMEAD)

By

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The genus *Xanthopimpla* SAUSSURE as represented in the SAUTER collection has already been treated by me.¹⁾ The present paper treats of the rest of the subfamily.

All holotypes and all allotypes, unless otherwise specified, are in the Deutsches Entomologisches Museum.

Genus *Eugalta* CAMERON

Eugalta CAMERON, Mem. Manch. Lit. Phil. Soc., vol. 43, 1899, No. 3, p. 135.

Baliëna CAMERON, Mem. Manch. Lit. Phil. Soc., vol. 44, 1900, No. 15, p. 101.

Pseudeugalta ASHMEAD, Proc. U. S. Nat. Mus., vol. 23, 1900, p. 55.

Bathymëris CAMERON, Ent., vol. 39, 1906, p. 251.

Formoxorides UCHIDA, Journ. Faculty Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, 1928,
p. 14.

The synonymy of *Baliëna* and *Bathymëris* is on the authority of MORLEY (2, 3) who synonymizes the genotypes of both with *Eugalta punctulate* CAMERON after examination of all types. In synonymizing *Bathymëris* he makes no mention of the eyes, which CAMERON had previously stated to be parallel within. If this is true the genotype can not be synonymous with *Eugalta punctulata* nor the genus with *Eugalta*. MORLEY also synonymizes (2) *Pseudeugalta* on the ground that the possession or lack of the areolet is not constant even in the wings of an individual. There can be no doubt that he is correct in this. The description of *Formoxorides* agrees so nearly exactly with one of the new species described below that there appears no reason for doubting its synonymy with *Eugalta*. Under both *Eugalta* and *Pseudeugalta* MORLEY (1) states that the clypeus is not separated from the face. In all of the species known to me it is distinctly separated.

(1) H. SAUTER's Formosa-Collection: *Xanthopimpla* (Ichneum.: Hym.). Entomologische Mitteilungen, XIV, p. 41-50, Berlin-Dahlem, 1925.

(2) Faun. Brit. India, vol. 3, Hym. part 1, Ichn. 1913, p. 69 (*Baliëna*).

(3) Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 337 (*Bathymëris*).

Of the holarctic genera this genus is most closely related to *Deuteroxorides* VIERECK, differing therefrom principally in the very peculiar claws of the hind tarsus, the inner one of which is like those of the other tarsi (curved with a small inner tooth before the apex) while the outer one is sharply broken at a right angle, lacks the inner tooth, and is provided at its base with a flattened subclavate hair, which extends across the angle to the apex. The propodeum is somewhat flatter than in *Deuteroxorides* and except apparently in the genotype, *strigosa* CAMERON, lacks all trace of the apical carina; the first tergite is narrower basally and without the basal impression and has a distinct subapical transverse impression, preceded by a more or less distinct elevation.

Two species, both apparently undescribed, are included in the SAUTER material. They may be distinguished at once by the following:

- Hind tibia testaceous or infusate, pale yellow at base and apex; areolet present..... *formosana* n. sp.
 Hind tibia fuscous, more or less pale at base, darkest at apex; areolet absent..... *cameroni* n. sp.

***Eugalta formosana* n. sp.**

Of the four species placed by MORLEY in *Pseudeugalta* this runs closest, because of its punctate mesoscutum and apically white hind tibiae, to *punctulata* CAMERON, but is at once distinguished by its black scutellum, practically smooth and impunctate second and third tergites, basally flavous and apically black first sternite, and its largely testaceous legs.

This species may be the same as the genotype of *Formoxorides*, *pilosa* (SZEPLIGETI), which is also from Formosa, but differs from the original description of *pilosa* in having the propodeal spiracles in the middle, the second recurrent vein behind the middle of the areolet, the spiracles of the first tergite slightly before the middle, and the legs differently colored.

Female—Length 14 mm.; antennae 11 mm.; ovipositor 10 mm.

Head practically smooth, except the rugose upper temples and the obsolete punctate posterior margin of vertex; frons deeply concave, frontal orbits obsolete elevated; face distinctly longer than wide, with sparse and indistinct punctures and a slight median longitudinal elevation. Thorax punctate throughout, except the very broad lateral impressions of pronotum and the speculum, subobsoletely so on lower pleura and sternum, transversely rugulose so on metapleurum, propodeum finely reticulate rugulose; areolet complete; legs very slender, hind coxae reaching beyond apex of first tergite. Abdomen very narrow; first three tergites laterally subobsoletely punctate; first tergite two and a half times as long as wide at apex, with a distinct dorsal elevation between

spiracles and apical groove, spiracles slightly before middle, sternite with a sub-prominent elevation toward base; second and third tergite with less distinct sub-basal and subapical transverse impressions; ovipositor sheath distinctly longer than abdomen.

Black; clypeus piceous; face, space between antennae, lower surface of scape, antennal annulus, propleura below, anterior margin of pronotum, tegulae, subalar callosity, posterior margin of mesopleurum, base and apex of first tergite, and apices of all others except last white; wings yellowish hyaline; legs testaceous, front and middle coxae, trochanters, and tibiae largely stramineous, tarsi fuscous; hind coxa at apex above, second joint of trochanter, and apex of femur piceous, basal joint of trochanter, apex of tibia, and tarsus largely stramineous; ovipositor sheath fuscous, paler at apex.

Male—Like the female but more slender; first tergite fully three times as long as wide at apex. The allotype lacks the areolet in the left wing.

Type-locality—Kankau (Koshun) Formosa.

Paratype—No. 43901, United States National Museum.

Six female and one male, the type, allotype, and two paratype from the type locality, the rest from Taihorin, Formosa.

The females range in size from 10.5 to 15 mm.

Three female paratypes are retained for the United States National Museum.

***Eugalta pilosa* (SZEPLIGETI) (new combination)**

Acherocephalus pilosus SZEPLIGETI, Ann. Mus. Nat. Hung., vol. 12, 1914, p. 423, ♀.

Formoxorides pilosus UCHIDA, Journ. Faculty Agr. Hokkaido Imp. Univ., vol. 25, 1928, p. 15, ♀.

As indicated above in the description of *formosana* CUSH., that species may be synonymous with *pilosa* in spite of the divergence from the description of *pilosa* there noted. Otherwise the present species is not included in the SAUTER collection.

***Eugalta cameroni* n. sp.**

In MORLEY's key to Indian species of *Eugalta* this runs to *linearis*, but it is at once distinguishable by its much shorter ovipositor, immaculate frons and humeral angle of pronotum, densely punctate scutellum, and by having only the first three tergites distinctly punctate.

From *formosana* CUSHMAN, in addition to its lack of the areolet, it differs by having the thorax and first three tergites more densely punctate, even the speculum being largely sculptured; the legs darker with the hind tibia fuscous except at base; the first tergite in the female fully three times as long as wide at apex and the sternite hardly tuberculate; and the ovipositor sheath not or

barely as long as the abdomen.

Female—Length 14 mm.; antennae (broken in all specimens); ovipositor 7.5 mm.

Head as in *formosana* CUSHMAN. Thorax very densely, finely punctate, pronotum polished in lateral groove, metapleurum and propodeum reticulate rugose; areolet wanting; hind coxae barely reaching beyond apex of first tergite. Abdomen slender; first tergite shagreened and punctate, fully three times as long as wide, spiracles nearly in middle, dorsally swollen between spiracles and apex, sternite only obsoletely tuberculate; second and third tergites distinctly and densely punctate, others practically smooth; ovipositor sheath hardly as long as abdomen.

Color as in *formosana* except that the tegules are reddish piceous; front coxae largely and middle and hind femora above piceous; middle coxae testaceous; middle and hind tibia fuscous except very narrowly at base; and hind tarsus to middle of second joint white.

Male—Like female, but with legs paler, the front and middle coxae and trochanters stramineous; hind femora testaceous; tegulae white.

Type-locality—Taihorin, Formosa.

Paratype—No. 43902, United States National Museum.

Two female and one male. The type and allotype from the type-locality and the paratype female from Kosempo, Formosa.

The paratype is only 12 mm. long but otherwise like the type.

Genus *Xorides* LATREILLE

As employed here this genus is equivalent to *Xylonomus* GRAVENHORST in the broad sense.

The SAUTER collection includes two species separable as follows:

Immaculata black; ovipositor as long as body

..... *immaculatus* n. sp.

Black with profuse yellow markings; ovipositor much shorter than body

..... *centromaculatus* n. sp.

Xorides immaculatus n. sp.

Apparently closely allied to (*Xylonomus*) *Xorides investigator* (F. SMITH) (3) from Japan. SMITH's description of the propodeal carinae is obscure, but it apparently is about as in the present species. He did not indicate the sex of his type, but since he makes no mention of the ovipositor it apparently was

(3) New combination.

a male. If this is true the present species is distinct, for the coarse sculpture extends on to the third tergite, and the second and third tergites have very distinct impressions and elevations, which SMITH would surely have mentioned had his species possessed them.

In FOERSTER's key to the genera of the *Xoridoidea* this species runs best to *Moerophora* FOERSTER.

Female.—Length 23 mm.; antennae broken but probably about 17 mm.; ovipositor sheath 24 mm.

Head from above slightly transverse, temples weakly receding, their length from eyes to occipital carina about two-third short diameter of eye; vertex and temples polished with scattered punctures, cheeks more densely and finely punctate and somewhat striate at base of mandibles; head in front view nearly circular; frons coarsely and rather densely punctate; face more coarsely punctate, triangularly elevated in middle, the elevation set off by oblique impressions converging toward clypeus, these impressions densely and finely punctate, interantennal prominence tuberculiform; basal portion of clypeus about half as long as apical portion; malar space a little more than half as long as basal width of mandible; antennae slender, broken but with 30 or more joints, flagellum hardly thickened toward apex, where it is curved (the apices of both antennae are missing, and most of the usual bristles are also gone), basal joint of flagellum distinctly shorter than second, which is hardly as long as third. Thorax coarsely sculptured, opaque, and clothed with long, dense, appressed, yellowish pubescence; pronotum coarsely, confluent punctate, the scrobe transversely striate; propleura strongly convex, confluent punctate; mesoscutum densely punctate, the prescutum more coarsely so than the lateral lobes, notauli coarsely foveolated, as is also a median groove in posterior middle; scutellum more sparsely punctate, fovea medianly striate; mesopleurum and sternum coarsely punctate; metapleurum and sides of propodeum coarsely reticulate-rugose; basal lateral areas finely rugose, areola more distinctly punctate, petiolar area longitudinally striate, basal area triangular, connected to the areola by a single median carina as long as itself; areola pentagonal, as long as broad, costulae very strongly oblique, petiolar area hardly half as long medially as areola, apophyses short; radius and cubitus contiguous, the intercubitus obliterated, second abscissa of cubitus long; nervulus postfurcal; nervellus broken at middle; legs, especially the coxae and femora, slender, apical joint of hind tarsus shorter than third joint, front tibia with few (about seven) stout spines on frontal side. Abdomen slender, coarsely rugoso-punctate basally, finely transversely striato-alutaceous apically; first tergite straight, nearly four times as long as broad at apex, with very weak oblique furrows near apex, dorsal carinae distinct only

at extreme base, sternite reaching well beyond spiracles and very nearly to middle of tergite; second tergite nearly twice as long as broad at base, with deep oblique furrows basally and shallower ones beyond middle; third tergite distinctly longer than broad, with distinct basal oblique grooves and obsolete ones beyond middle; seventh tergite not longer than eighth.

Black; under-side of scape, clypeus, palpi, front and middle coxae and all trochanters, tibiae and tarsi except apical joints of the last stramineous, hind coxae and femora entirely and other femora partly piccous black; antenna with a broad white annulus; wings yellowish hyaline, venation black, tegulae ferruginous.

Male—Length 15 mm.; antennae missing. Very similar to female except that the hind femur is distinctly stouter, the front and middle legs are entirely pale testaceous to stramineous, the hind tibia (except extreme base) and the hind tarsus are blackish, and the second and third tergites have a median subcarinate ridge.

Type-locality—Kosempo, Formosa.

Allotype-locality—Kankau, (Koshun), Formosa.

Allotype—No. 43903, United States National Museum.

One specimen of each sex.

***Xorides centromaculatus* n. sp.**

Because of the long erect antennal pubescence the male runs in FOERSTER'S key to *Sterotrichus* FOERSTER, but the female antennae have short, nearly recumbent pubescence. It runs better *Xylonomus* than to any of the other genera, although the constriction of the first tergite is very shallow.

Female—Length 10 mm.; antennae 6 mm.; ovipositor sheath 4.5 mm.

Head slightly transverse, temples weakly receding, their length from front to back a little more than half the short diameter of the eye; vertex and temples polished, the latter sparsely punctate, cheeks more densely punctate, striate at base of mandibles; head in front view subcircular; frons sparsely and finely punctate; face more coarsely but not densely punctate, convex but without a defined median area, interantennal prominence compressed; basal portion of clypeus barely a third as long as apical portion; malar space distinctly more than half as long as basal width of mandible; antennae 21-22-jointed, flagellum very slender at base, somewhat thickened apically, first and second joints equal in length and very slightly shorter than third, flagellum slightly curved at apex, joints 17 and 18 each with two long bristles on the outer side of the curve, joints 16 and 19 with small, inconspicuous bristles. Propleura weakly convex, polished and sparsely punctate; pronotum rather densely punctate, the scrobe

and the lower margin polished and unsculptured; mesoscutum densely punctate, opaque, rugose in posterior middle, notauli finely foveolate; scutellum punctate and with a short median longitudinal carina, fovea divided by a middle ridge into two polished pits; mesopleurum polished, sparsely punctate, speculum impunctate; mesosternum densely, finely punctate, metapleurum and propodeum rugose; areola subpentagonal, as broad as long, narrowly confluent with the basal area, costulae somewhat oblique; petiolar area with two longitudinal carinae medially; apophyses rather long and slender; radius and cubitus contiguous, second abscissa of cubitus long, nervulus postfurcal, nervellus broken at middle; legs rather stout, the coxae not elongate; front and middle tibiae slightly inflated; apical joint of hind tarsus very nearly as long as second joint; front tibia with many spines on anterior face. Abdomen not slender, coarsely punctate, and more or less rugose basally, finely transversely striato-alutaceous apically; first tergite deflexed at basal third, median carinae extending to beyond spiracles, oblique lateral grooves moderately deep, sternite barely reaching as far as spiracles; second tergite broader than long, median area set off by deep grooves basally and weaker one apically and divided by a broad median impression into two rounded elevations; the same structure repeated but very weakly on third tergite; tergite 4-6 very short; 7 and 8 subequal.

Black, with profuse yellow markings as follows: annulus embracing flagellar joints 9-14, under-side of scape, face except medially, broad orbits interrupted at top of eye, middle of propleurum, dorsal and lower margins of pronotum, a spot in center of mesoscutum, scutellum and postscutellum, a curved spot covering the subalar tubercle and upper portion of front margin of mesopleurum, a longitudinal spot on lower mesopleurum and a small one in front of middle coxa, mesometapleural suture, apex of propodeum and metapleurum, a large triangular spot on each side of first tergite at apex and a small median spot and apical margins of all other tergites, the color running more or less along the lateral margins of all except the second tergite and interrupted medially on the eighth; palpi, clypeus, front and middle coxae largely, tarsi except apical joints, stripes on inner and outer sides of front and middle tibiae, front and middle femora below at apex, and extreme base of hind tibia stramineous; front and middle femora and their tibiae below ferruginous, the tibia piceous above; hind coxa ferruginous at apex, trochanter piceous, femur ferruginous, its apex piceous, tibia fuscous; wings hyaline, venation black, stigma brown, pale at base, tegulae piceous with or without a small yellow spot at base.

Male—Length 11 mm.; antennae 8.5 mm.

Antennae slender, tapering toward apex, pubescence long and erect, first joint of flagellum shorter than second, apex of flagellum straight; abdomen much

more slender; first tergite with dorsal carinae extending to apex; elevations and grooves of second tergite less pronounced; tergite from second to last gradually, successively shorter.

All yellow markings much reduced except those of head; antennae without annulus; two lower marks of mesopleurum, that on mesoscutum, that on propleurum, and sometimes that on lower margin of pronotum lacking, scutellum and propodeum also sometimes entirely black; legs darker, the hind coxa and femur piceous. Otherwise much like female.

Type-locality—Taihorin, Formosa.

Paratypes—No. 43904, United States National Museum.

The paratypes are from Taihorin, Kankau, Anping, and Hoozan, Formosa. Four females and two males, two females and one male of which are in the United States National Museum.

Genus *Spiloxorides* CAMERON

This genus is perhaps no more than a subgenus of *Xorides*; but it is at once distinguishable by the antefurcal nervulus, distinct intercubitus, short second abscissa of cubitus, and, in the female, by the peculiar form of the flagellum, which has a geniculate joint between the seventeenth and eighteenth joints. In these respects it does not differ from *Cyanoxorides* CAMERON.

Neither of the two species described below agrees entirely with the description of this genus, but the structure of the female antennae is so characteristic that there is, I think, ample ground for placing them in the genus.

Spiloxorides rufipleuralis n. sp.

Female—Length 12.5 mm.; antennae 6.5 mm.; ovipositor sheath 7.5 mm.

Head very finely and rather densely punctate; temples distinctly, convexly receding, about a third as long from front to back as short diameter of eye; face strongly convex, a little more coarsely and somewhat transversely striately punctate, the interantennal prominence long and thin; basal portion of clypeus about half as long as apical portion; malar space a little more than half as long as basal width of mandible; cheeks striate; antennae slender, 22–23 jointed, first joint of flagellum distinctly longer than second which is slightly shorter than third, seventeenth joint obliquely truncate at apex with two unequal bristles at extreme tip, the apical three or four joints forming a short lashlike appendage. Pronotum irregularly rugose-striate, the scrobes foveolate; mesoscutum finely punctate opaque, notauli and median posterior area coarsely rugose, lateral lobes each with a shallow longitudinal groove; scutellum convex, finely punctate, margined laterally and with a short longitudinal carina at each side of apex;

mesopleurum and sternum finely punctate, the posterior furrow foveolate; meta-pleurum and propodeum mostly coarsely rugose; propodeum completely areolated, areola longer than broad, its anterior side narrow but distinct; costulae slightly oblique; basal lateral areas punctate; petiolar area polished, with two longitudinal carinae in middle, more than half as long as areola; intercubitus distinct, longer than second abscissa of cubitus, nervulus antefurcal, nervellus broken slightly below middle, reclivous, the upper abscissa nearly perpendicular to mediella; legs rather slender, front and middle tibiae only slightly swollen, hind coxae not especially elongate, apical joint of hind tarsus much shorter than second joint. Abdomen densely punctate, the apical tergites transversely alutaceous; first tergite decurved, twice as long as broad, dorsal carinae obsolete but extending nearly to apex, oblique grooves distinct but not especially deep; second and third tergites with basal lateral elevations, basal and subapical oblique grooves and a median basal fovea more distinct on second than on third; tergites 7 and 8 long and subequal in length, 4-6 very short.

Head black, face except medially, broad orbits, interrupted at top of eyes, whitish, clypeus reddish, scape below piceous, flagellar joint 9-14 white, palpi and base of mandible piceous. Thorax ferruginous; mesoscutum, pronotum medially, mesopleura and sternum and propodeum anteriorly, black to piceous; propleura, lower anterior margins of pronotum, subalar tubercle, meso-metapleural suture, apex of scutellum, and sometimes small streaks on lower part of mesopleurum whitish; wings yellowish with small clouds about intercubitus and nervulus; venation black, base of stigma white; legs ferruginous, front coxae more or less whitish, front and middle coxae, apical joints of all trochanters, apex of hind femur, hind tibia, and base and apex of hind tarsus more or less blackish to brownish, middle of hind tarsus paler. Abdomen black with white as follows: first tergite at base and apex, second and seventh with broad apical bands, that of seventh extending along the sides, third to sixth with narrow interrupted apical bands sometimes distinct only in middle, eighth with broad lateral bands and two spots medially.

Male—Length 11 mm.; antennae 11 mm.

Differs from female principally as follows: head less densely punctate, the vertex virtually impunctate; temples half as long as short diameter of eye; antennae very slender filiform with long erect pubescence, tapering toward apex, 30-jointed, first joint of flagellum slightly shorter than second; petiolar area hardly half as long as areola; abdomen parallel side, narrow; first tergite more than twice as long as broad, the dorsal carinae very distinct; tergites 4-6 not reduced, tergite 2-7 each with a deep pit on each side of middle, deepest on 6 and shallowest on 2, on 2 and 3 these are at the inner ends of the apical

oblique grooves, but on the others all grooves are lacking and the pits occupy a considerable portion of the surface; tergite 8 barely exerted.

Antennae without pale annules, scape whitish below; palpi testaceous, base of mandible rufous; infumate clouds of wings very faint; front and middle legs entirely testaceous, the tarsi paler and tibiae somewhat darker, hind coxa and femur testaceous, the latter blackish at apex, trochanter stramineous, tibia blackish with extreme base pale, tarsus fusco-ferruginous, third and fourth joints paler; first tergite ferruginous, tergites 2-6 narrowly yellowish at apex, 2-4 more broadly reddish yellow laterally, 7 broadly at apex medially to base and 8 entirely yellowish.

Type-locality—Hoozan, Formosa.

Allotype and paratype—No. 43905, United States National Museum.

Described from three females and one male (the allotype), the latter from Kankau (Koshun) and the two paratype females from Kosempo. One of the paratypes is considerably smaller than the type and has the first tergite ferruginous in middle rather than blackish.

***Spiloxorides propodeum* n. sp.**

Female—Length 10 mm.; antennae 5.6 mm.; ovipositor sheath 6 mm.

Very similar to *rufipleuralis* but differing as follows: vertex polished and virtually impunctate; temples a little longer; interantennal process thick, with a narrow median groove; antennae 24 jointed, joints 1 and 2 of flagellum about equal, the apical lash 5-jointed. Pronotum finely striate above; lateral and apical carinae of scutellum obsolete; metapleurum finely and not densely punctate; propodeum with pleural areas and areola obsoletely rugose, the lateral areas punctate, petiolar area polished, much less than half as long as areola, areolation otherwise as in *rufipleuralis*; first tergite more than twice as long as broad.

Sides of face and orbits more narrowly whitish; clypeus concolorous with middle of face; flagellar joints 10-15 white as is also a narrow streak on outer side of joints 1-6; thorax black with only metapleura, propodeum, and sides of metanotum ferruginous and only the sutures between pleura pale; legs more nearly uniform in color but with same pattern with the light colors darker and dark colors lighter; infumate spots of anterior wings obsolete; third tergite with only a trace of the apical pale band, eight immaculate; ovipositor sheath with a broad whitish band near apex.

Type-locality—Kosempo, Formosa.

One female.

Genus *Siphimedia* CAMERON

Macrogaster CAMERON, Mem. Manch. Lit. and Phil. Soc., vol. 43, 1899, p. 193; MORLEY, Faun. Brit. India, Hym., vol. 3, 1913, p. 25 (not Brullé).

Siphimedia CAMERON, Journ. Straits. Br. Roy. Asiatic Soc., vol. 37, 1902, p. 43.

Lethulia CAMERON, Journ. Straits. Br. Roy. Asiatic Soc., vol. 39, 1903, p. 145 (new synonymy).

Acaenitus MORLEY, Faun. Brit. India, Hym., vol. 3, 1913, p. 40 (not *Acoenites* LATREILLE).

Metachorischizus UCHIDA, Journ. Facul. Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, 1928, p. 35, Pl. 1, fig. 14 (new synonymy).

Apparently MORLEY overlooked in the description of *Siphimedia* CAMERON's statement that he was erecting the genus for the four species that he had previously placed in *Macrogaster*. Otherwise it is difficult to understand why he should retain the name *Macrogaster* for the CAMERON species. More difficult yet is it to understand why he should place these and his obviously closely related species of *Acaenitus* in different tribes, while noting the very close similarity between one of the species in each group. Again following CAMERON, who, however, had already removed his own species from *Macrogaster*, MORLEY synonymizes the African *Ctenotoma* CAMERON with *Macrogaster* without even expressing the doubt indicated by CAMERON. This genus is certainly not *Macrogaster* in the sense of MORLEY since its author states that "the ovipositor projects from the lower surface" indicating a short hypopygium, and that the spiracles are at the apical third of the first tergite. It is almost as certainly not the true *Macrogaster* because of the position of the first tergal spiracles and the short ovipositor.

Acaenitus, as treated by MORLEY in the above reference, is certainly not distinct from the present genus in spite of the apparent differences of "deeply and semicircularly separated" clypeus and antennae "as long as or rather longer than half the body", for of the four species described by MORLEY three are said to have the clypeus distinctly separated while this character is not defined for the fourth, and the two species figured are shown as having the antennae very long, one being described as having them "fully as long as the body."

The Neotropical *Retanisia* CAMERON is, as indicated by MORLEY (1), very closely allied to *Siphimedia*, so closely, in fact, that there is no item in the original description that will not apply equally as well to one or more species of *Siphimedia*, and unless *Retanisia* has some feature more distinctive than any ascribed to it by CAMERON *Siphimedia* is certainly synonymous with it.

The species of this genus that are known to me differ in no essential way from *Phaenolobus areator* (RATZEBURG), genotype of *Phaenolobus* FOERSTER, although the antennae and ovipositor are much longer and the nervellus is broken

(1) Rev. Ichn. B. M., part 1, 1912, p. 4.

at about the middle instead of above, and *Acaenites nigrolineatus* Tosquinet does not differ in the nervellus.

I retain the name *Siphimedia* as distinct from *Phaenolobus* on the strength of these characters and because of its Oriental distribution.

Following is a list of the described species in addition to those placed here by CAMERON that I would refer to this genus:

(*Acoenites*) *Siphimedia nigrolineatus* (TOSQUINET), Mem. Loc. Ent. Belg., vol. 10, 1908, p. 109 (new combination).

(*Acoenites*) *Siphimedia testaceus* (TOSQUINET), loc. cit., p. 112 (new combination).

(*Acaenites*) *Siphimedia grandipes* (MORLEY), Faun. Brit. Ind., vol. 3, Ichn., 1913, p. 41 (new combination).

(*Acaenites*) *Siphimedia alecto* (MORLEY), loc. cit., p. 42 (new combination).

(*Acaenites*) *Siphimedia xanthorius* (MORLEY), loc. cit., p. 43, pl. I, fig. 1 (new combination).

(*Acaenites*) *Siphimedia bimbratus* (MORLEY), loc. cit., p. 44 (new combination).

(*Lethulia*) *Siphimedia flavipes* (CAMERON), Journ. Straits. Br. Roy. Asiatic Soc., No. 39, 1903, p. 145 (new combination).

(*Metachorischnus*) *Siphimedia unicolor* (UCHIDA), Journ. Facul. Agr., Hokkaido Imp. Univ., vol. 25, 1928, p. 35, Pl. I, fig. 14 (new combination).

(*Acoenites*) *Siphimedia lutea* (UCHIDA), Insecta Matsumurana, vol. 4, 1930, p. 125 (new combination).

All of the above generic transfers are based upon the original descriptions except that of *Lethulia flavipes* CAMERON, a cotype of which is in the United States National Museum.

Five species, apparently all underscribed, are represented by one specimen each in the SAUTER material. Two of these are males and are not described herewith. The three species represented by females are separable by the following key:

1. Ferruginous *rufa* n. sp.
- Black or largely black 2.
2. Antennae and hind legs entirely black *nigra* n. sp.
- Antennae with white annules, hind femora red *varicolor* n. sp.

***Siphimedia rufa* n. sp.**

Apparently most like *lutea* UCHIDA and possibly the same, but the propodeum has a well defined petiolar area and differs otherwise from UCHIDA's description. Also the wing has a distinct cloud below the stigma, while *lutea* has the wing infumate only apically.

Also much like *unicolor* (UCHIDA), but differs from the description of that species in the very high median frontal carina, the very distinct petiolar area of the propodeum, the narrower first tergite, and the shorter hypopygium, which does not surpass the apex of the tergum.

Female—Length 15 mm.; antennae 13 mm.; ovipositor 15 mm.

Face much broader than frons, coarsely transversely rugoso-punctate, the rugae becoming oblique laterally below and extending on to sides of clypeus, which is inflexed and truncate at apex and rather distinctly separated from face, foveae nearly obscured by coarse sculpture; malar space as long as basal width of mandible; cheeks coarsely punctate, temples more sparsely and finely so; frons polished medially, densely punctate and swollen laterally, with a sharp median carina that extends to upper part of face, where it becomes diffused in the coarse sculpture; ocelli deeply inset; occipital carina medially subangulate. Pronotum finely and densely punctate above, polished below, the impression strongly transrugose; mesoscutum rather finely punctate, more coarsely and sparsely so on lateral lobes, prescutum elevated, truncate anteriorly, notauli strongly foveolate especially at their junction; scutellum nearly flat above with lateral carines extending strongly to middle, densely and finely punctate, the scutellar fovea almost carinately limited before and behind and coarsely foveolate; mesosternum and mesopleurum (except the polished speculum) coarsely and closely punctate, as is also the metapleurum; propodeum coarsely reticulate rugose, the basal areolation obscured by the sculpture, but with small square basal area and areola more or less distinct, petiolar area polished medially, obliquely rugose laterally; hind coxa and femur punctate, femur stout; second recurrent vein interstitial; nervulus strongly antefurcal, nervellus broken at middle. First tergite strongly convex above, weakly punctate, basal impression and carinae obsolete, spiracles before middle, sternite in side view subacutely toothed; other tergites smooth; hypopygium reaching apex of abdomen.

Ferruginous; head in front and below and thorax below paler; antenna fuscous, darker at apex, paler below toward base, and with a poorly defined yellowish annulus, scape yellowish below; wings hyaline, yellow especially basally, with stigmal and apical clouds, venation black, stigma reddish; legs testaceous, only the hind femur at base and tarsus at apex blackish; abdomen ferruginous, second tergite piceous at base.

Type-locality—Taihorin, Formosa.

One female.

Siphimedia nigra n. sp.

Very close to *nigricans* (CAMERON), with the description of which it agrees except that the mesopleura are not rugose, the propodeum is polished medially in the petiolar area, and the inner orbits are only obscurely white opposite the antennae.

Female—Length 13 mm.; antennae 12 mm.; ovipositor 14 mm.

Face distinctly wider than frons, medially carinate, coarsely rugoso-punc-

tate; clypeus not distinctly separated, sparsely and more finely punctate than the face, apparently subangulately rounded at apex, the true inflexed apex hidden beneath the apparent apex; malar space hardly as long as basal width of mandible; cheeks and temples punctate, temples more sparsely so; frons midially polished, laterally densely punctate, with a strong median carina continuous with the facial carina; vertex punctate, with a deep impression posteriorly that causes a deep emargination in the occipital carina, ocelli somewhat inset. Thorax in sculpture and structure about as in *rufa*, but metapleurum reticulate rugose and propodeum with more distinct carina, areola not at all defined and the basal area broader than long; second recurrent vein interstitial, nervulus nearly so, nervellus broken at middle; hind coxa and femur punctate, femur stout. First tergite polished, impunctate, weakly convex, spiracles before middle, sternite viewed from side with an acute slightly recurved tooth; hypopygium reaching beyond apex of abdomen.

Black, the polished portions with plumbeous reflection; front legs reddish in front; wings infumate with darker stigmal and apical clouds.

Type-locality—Hoozan, Formosa.

One female.

Siphimedia varicolor n. sp.

Female—Length 8 mm.; antennae 7 mm.; ovipositor 9 mm.

Face much broader than frons, densely punctate, slightly elevated medially and with a short median carina above continuous with the frontal carina; clypeus broadly and shallowly separated, coarsely and sparsely punctate, reflexed and submarginate at apex with an obsolete tooth medially above the inflexure; malar space subequal to basal width of mandible; cheeks sparsely punctate; temples more finely and sparsely so; vertex medially and frons laterally densely, finely punctate opaque, otherwise polished; ocelli slightly inset; occipital carina subangulate medially. Pronotum finely and sparsely punctate above, polished below, foveolate in impression; mesoscutum finely, opaquely punctate, prescutum gibbous medially impressed in front, notauli finely foveolate; scutellum finely and rather sparsely punctate, shining, lateral carinae extending to middle, fovea foveolate; mesosternum and pleurum punctate, pleurum more sparsely so and with a very large polished speculum; metapleurum rather densely and finely punctate; propodeum laterally with a few rugae, petiolar area medially polished, basal area broader than long, areola not defined; second recurrent vein interstitial, nervulus slightly antefurcal, nervellus broken at middle, hind coxa and femur punctate, femur not especially stout, fully three times as long as thick. Abdomen polished throughout; first tergite rather flat above, with distinct basal impression

and lateral carinae extending to spiracles, sternite nearly flat; hypopygium extending barely to apex of abdomen.

Black; inner orbits from malar furrow nearly to top of eyes broadly white; mandibles and apex of clypeus whitish; antennae black, scape testaceous beneath, flagellum with a broad white annulus just beyond middle; tegulae, wing bases, scutellar area, apex of metapleurum, and propodeum apically and medially nearly to base stramineous to pale testaceous; wings pale yellowish hyalin, infumate at apex, venation blackish; front and middle pale testaceous, their coxae except at extreme base and their trochanters stramineous, the middle femur brownish above; hind coxa black, its apex and the basal joint of trochanters stramineous, femur and apical joint of trochanter testaceous, more or less piceous above, tibia and tarsus fuscous, tibia paler at base; first tergite at apex broadly, second to fifth narrowly and less conspicuously reddish, apical tergite and the broad membrans between the sixth and very narrow seventh whitish; sheath with a whitish annulus near apex.

Type-locality—Kosempo, Formosa.

One female.

Genus *Leptobatopsis* ASHMEAD

Leptobatopsis ASHMEAD, Proc. U. S. Nat. Mus., vol. 23, 1900, p. 49.

Tanera CAMERON, Spolia Zeylanica, 1905, p. 141, pl. 3, fig. 11.

Sauterellus ENDERLEIN, Stett. Ent. Zeit., Jahrg. 73, Hft. 1, 1912, p. 113.

Leptobatopsis CUSHMAN, Philippine Jour. Sci., vol. 20, 1922, p. 591; Proc. U. S. Nat. Mus., vol. 64, art. 20, 1924, p. 6.

I have discussed this genus at some length in the two references cited above.

A peculiar character which it shares with *Syzeuctus* and *Diceratops* is the possession on the metasternum of a pair of processes, elevated near the median line into a high tooth-like projection and with a smaller tooth just in front of the hind coxal cavity.

Certain of the species, notably *indicus* (CAMERON) are very widely distributed through the Oriental and Australian regions.

Syzeuctus FOERSTER as treated by MORLEY in the Fauna of British India is apparently composed entirely of species of this genus. The genus is, however, apparently distinct from, though closely allied to *Syzeuctus*. The temples are more strongly receding, being nearly perpendicular to the longitudinal axis of the body, the occipital carina lies very close to the occipital foramen and is entirely effaced medially, the antennae are longer and more slender, the propodeum lacks entirely the apical carina, and the first tergite is distinctly petiolate with the petiole cylindrical and the basal impression obsolete.

Five species are included in the SAUTER collection separable as follows:

1. Thorax almost entirely black, only the subalar tubercle and the lower margin of pronotum yellow marked..... *niger* n. sp.
- Thorax more conspicuously marked with yellow, the scutellum always yellow 2
2. Hind tibia and tarsus black with narrow white annulus at base
..... *indicus* (CAMERON)
- Hind tibia or tarsus or both not so colored 3
3. Antennae with pale annulus; metapleurum with a large, ventrally emarginate yellow spot *lepidus* (CAMERON)
- Antennae without pale annulus; metapleurum at most with a rounded yellow spot at apex 4
4. Abdomen largely red; hind coxae red, sometimes piceous beneath basally; ovipositor as long as abdomen..... *planiscutellatus* (ENDERLEIN)
- Abdomen black and yellowish; hind coxae yellowish red at base, black at apex; ovipositor shorter than abdomen *bicolor* n. sp.

***Leptobatopsis niger* n. sp.**

Distinct in its almost entirely black thorax with black scutellum.

Female—Length 10 mm.; antennae 10 mm.; ovipositor 5 mm.

Head, except middle of face and base of clypeus, highly polished impunctate, face medially elevated, rather densely punctate, clypeus basally scarcely so; eyes slightly divergent below, nearly twice as long as their distance apart at the vertex; malar space distinctly shorter than basal width of mandible; frontal orbits slightly elevated; diameter of lateral ocellus as long as postocellar line and longer than ocell-ocular line. Thorax much less than twice as long as high, densely punctate, pronotum less strongly so, scutellum, posterior portion of mesoscutum, and a rather small speculum polished impunctate, pronotum obliquely rugulose in impression; areolet strongly petiolate; nervellus interstitial; postnervulus broken slightly above middle; nervellus very slightly reclivous, broken slightly below middle. Abdomen rather stout, twice as long as thorax, second tergite barely twice as long as wide at apex; first and apical tergites polished, second and third weakly coriaceous, second with scattered shallow punctures; spiracle of first slightly beyond middle; ovipositor not quite so long as abdomen.

Black; frontal orbits, clypeus, malar space, mandibles, palpi, small spots near lower angle of pronotum and on subalar tubercle, front coxae entirely and middle coxa largely yellow to whitish; antennae blackish, pale brownish below at base; wings hyaline, slightly tinged with yellow, with a large definite infumate spot at apex, venation brown, radices stramineous, tegulae brown, legs testaceous, middle and hind ones piceous above; front and middle tarsi fuscous (hind tarsi

missing), hind tibia fuscous, paler in middle and below at base; abdomen black, base of first and suture between second and third and third and fourth piceous.

Type-locality—Kankau, (Koshun), Formosa.

One female.

***Leptobatopsis lepidus* (CAMERON) (new combination)**

Lissonota lepida CAMERON, Zeits. Hym. Dip., vol. 8, part 1, 1908, p. 43, male.

Syzeuctus compressus MORLEY, Faun. Brit. Ind., vol. 3, Hym., part 1, Ichn. 1913, p. 234, fig. 57, female.

Syzeuctus lepidus MORLEY, Ann. and Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 337.

The synonymy is by MORLEY and appears to be entirely correct. I had, in fact, arrived at the same conclusion from a comparison of the description with the aid of a single female specimen from Kankau, Formosa. The yellow metapleural spot is very characteristic in form. The spiracle of the first tergite is before the middle.

One female from Kankau (Koshun).

Lissonota spilopus CAMERON, which from its very slender first tergite undoubtedly belongs to *Leptobatopsis*, is very closely related to *lepida*.

***Leptobatopsis indicus* (CAMERON) (new combination)**

Cryptus indicus CAMERON, Mem. Proc. Manch. Lit. Phil. Soc., vol. 41, no. 4, 1897, p. 15, male.

Mesoleptus annulipes CAMERON, loc. cit., vol. 44, no. 15, Oct. 9, 1900, p. 103, male.

Leptobatopsis australiensis ASHMEAD, Proc. U. S. Nat. Mus., vol. 23, Oct. 13, 1900, p. 47; Proc. Linn. Soc. N. S. W., 1900, pt. 3, p. 349, female (new synonymy).

Atropha clypearia ASHMEAD, Proc. U. S. Nat. Mus., vol. 28, 1904, p. 143, female (new synonymy).

Tanera annulipes CAMERON, Spolia Zeyl., 1905, p. 141, pl. B, fig. 11, female.

Syzeuctus javanicus SCHMIEDEKNECHT, Gen. Ins., fasc. 42, 1907, p. 82, female, male (new synonymy).

Atropha ? apicalis SZEPLIGETI, Leyden Mus. Notes, vol. 32, 1910, p. 101, female, male (new synonymy).

Syzeuctus annulipes (CAMERON) MORLEY, Faun. Brit. Ind., vol. 3, Hym., pt. 1, Ichn., 1913, p. 236, fig. 58.

Syzeuctus indicus (CAMERON) MORLEY, Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 337.

Leptobatopsis australiensis CUSHMAN, Phil. Journ. Sci., vol. 20, 1922, p. 591.

The examination of much more material of this and other species has convinced me that MORLEY is correct in synonymizing both *Mesoleptus annulipes* CAMERON and *Tanera annulipes* CAMERON with *indicus*; and there appears to be no doubt that the further synonymy given above is correct.

This is a very widely distributed species, being known under its various names from Ceylon, various points in India, Singapore, Java, Australia, and the Philippine Islands, while six specimens, three from Hokuto and one each from Kosempo, Tajhorin, and Suisharyo, are included in the SAUTER collection.

***Leptobatopsis planiscutellatus* (ENDERLEIN)**

Sauterellus planiscutellatus ENDERLEIN, Stett. Ent. Zeit., Jahrg. 73, Hft. 1, 1912, p. 113.

Leptobatopsis planiscutellatus CUSHMAN, Proc. U. S. Nat. Mus., vol. 64, art. 20, 1924, p. 6.

Female—Length 13 mm.; antennae 13 mm.; ovipositor 8. mm.

Head polished impunctate except middle of face, which is sparsely punctate; face medially weakly elevated; eyes divergent below, scarcely a half longer than width of vertex; malar space nearly as long as basal width of mandible; frontal orbits slightly swollen; diameter of lateral ocellus scarcely as long as the nearly equal ocell-ocular and postocellar lines. Thorax less than twice as long as high, densely punctate, scutellum more sparsely so, speculum very small; wings as in *niger* CUSHMAN except that nervellus is broken above the middle and is strongly reclivous. Abdomen rather slender, somewhat more than twice as long as thorax, second tergite more than twice as long as wide at apex; first and apical tergites polished, second to fifth opaquely shagreened; spiracle of first hardly beyond middle; ovipositor as long as abdomen.

Black with abdomen largely ferruginous and legs testaceous; inner orbits, projecting triangularly inward on frons, malar space, clypeus, mandibles, palpi, scape and pedicel beneath, front and middle coxae and trochanters, small spots at positions of notauli, humeral angles of pronotum, and subalar tubercles, scutellum, radices of wings, base of first tergite, and hind tarsus except at extreme base and apex yellow; flagellum fuscous, ferruginous at base and apex; wings hyaline, strongly infumate at apex, venation blackish; legs testaceous, front and middle ones and hind tibia basally almost stramineous; hind coxae piceous basally, tibia fuscous apically; abdomen ferruginous, first tergite piceous from spiracles to near apex.

Male—Has eyes more widely divergent, malar space longer, ocelli larger, entire face and frons and about the anterior third of mesoscutum, tegulae, and entire front and middle legs yellow, hind legs paler, and abdomen darker and more slender; otherwise about as in female.

Four females and five males collected at Taihorin and Suisharyo.

The series exhibits some variation in size and in the size of the yellow markings.

***Leptobatopsis bicolor* n. sp.**

Female—Length 11 mm.; antennae 11 mm.; ovipositor 4 mm.

Head polished; face medially sparsely punctate; frontal orbits scarcely swollen; eyes parallel within, about two-fifths longer than width of vertex; diameter of lateral ocellus and postocellar and ocell-ocular lines subequal; malar space two-thirds as long as basal width of mandible. Thorax slightly less than twice as

long as high, densely punctate with scutellum sparsely so and the small speculum impunctate, lateral impressions of pronotum rugose; wings as described for *niger* CUSHMAN except that nervellus is perpendicular and broken distinctly below middle. Abdomen twice as long as thorax; second tergite twice as long as wide at apex; first and apical tergites polished, second and third opaque shagreened; spiracle of first distinctly beyond middle; ovipositor distinctly shorter than abdomen.

Black; inner orbits, triangularly expanded on frons, malar space, clypeus, mandibles, palpi, under side of scape and pedicel, anterior margin and humeral angles of pronotum, marks in positions of notauli, scutellum, small marks on subalar tubercles and before middle and hind coxae, front and middle coxae and trochanters, hind tarsi except at base and apex, base of first tergite, suture between first and second, third except a transverse black subapical spot, apical tergites and apex of hypopygium pale yellow or whitish; antennae black, brownish beneath at base; wings hyaline, with an infumate spot at apex, venation blackish, radices whitish, tegulae brown; front and middle legs stramineous with middle tibia at apex and its tarsus fuscous; hind coxa and trochanters pale testaceous, the coxa piceous apically, especially above; femur piceous, reddish near base; tibia black, broadly yellow near base; base and apex of tarsus black; abdomen, except as noted, black.

Male—Differs from female in having the eyes distinctly divergent below; face and frons entirely yellow; ocelli larger; scape and pedicel entirely yellow; all yellow markings of thorax larger, those of mesoscutum confluent and extending entirely across the anterior end of the sclerite, and those of the mesopleurum meeting on the median line; front and middle legs, except the fuscous middle tarsi, entirely yellow; hind coxae piceous only above at apex; femur about half red; tibia less broadly pale; fourth tergite yellow.

Type-locality—Suisharyo, Formosa.

Paratype—No. 42906, United States National Museum.

One female and two males, all from the type locality.

***Telentaea gracilis* n. sp.**

Very similar in structure and color to *striata* (GRAVENHORST) but distinguishable by the more slender abdomen, the presence on the fifth tergite of distinct oblique grooves and the deeper grooves on the other tergite, the lateral lobes being elevated at apex.

Female—Length 10 mm.; antennae 9 mm.; ovipositor 6.5 mm.

Head in front view much broader than long, polished except face which is very minutely punctate; clypeus convex, deeply notched at apex; malar space

as long as basal width of mandible; temples strongly receding. Thorax rather finely, densely punctate, more coarsely so on propodeum and more sparsely on mesopleura, speculum impunctate; epomia very strong nearly to upper margin of pronotum, where they terminate in tubercle-like elevations; notauli distinct; propodeum without carinae except the medially obsolete apical carina, not separated from metapleura; areolet petiolate; nervellus broken distinctly above middle, reclivous. Abdomen very slender, densely and rather finely punctate to apex of fifth tergite; first tergite with dorsal carinae only on basal half, nearly twice as long as broad at apex; second to fourth about a half longer than broad at apex with the oblique grooves deep, the middle lobe carinately prominent throughout; fifth tergite with distinct though more shallow grooves and the lobes less prominent; apical tergites smooth; ovipositor as long as abdomen.

Black with the following yellow markings: clypeus, mandibles, pronotum medially above, at lower angle, and on humeral margin, tegula, a spot below, a spot below posterior wing, a large ovate spot occupying nearly the lower half of the mesopleurum, scutellum, postscutellum, a broad band across propodeum, and apices of first five tergite; antennae black, apical margin of scape and pedicel beneath yellow, wing hyaline, venation black, radix yellow; legs testaceous, front and middle coxae and trochanters, hind coxa above and its trochanter apically, and its tibia basally and beneath stramineous; hind coxa and its trochanter basally reddish piceous; hind femur at base and apex, tibia except as noted, and entire tarsus black or fuscous.

Type-locality—Taihorin, Formosa.

Paratype—No. 43907, United State National Museum.

Three female.

Genus *Apophua* MORLEY

It is very curious that a person with MORLEY's wide acquaintance with species of all zoological regions should found an ichneumonid genus on the fact that the front tibia had a single calcarium. What an anomalous ichneumonid would be one with *two* calcaria on the front tibia.

Apophua may perhaps be retained as a genus distinct from *Glypta* because of the great length of the anterior calcaria, gross sculpture, etc., but in these and several other more or less variable characters it does not differ materially from certain Palearctic and Nearctic species (*flavolineata* GRAVENHORST and *simplicipes* CRESSON) that have always been referred to *Glypta*, and which would have to be transferred to *Apophua*. As thus constituted the genus differs from the typical *Glypta* also in having the clypeus large and long and more or less distinctly divided into basal and apical portions by a transverse ridge and sub-

truncate at apex, and the occipital carina strongly sinuate at level of lower eye margin.

To this genus should probably also be referred *Glypta flavocingulata* TOSQUINET, *Glypta iridipennis* SMITH, *Glypta subfusca* TOSQUINET, and *Glypta tricarinata* CAMERON. The first may be synonymous with *concinna* MORLEY; *iridipennis* is apparently distinct because of its red abdomen; *subfusca* is apparently distinct; and *tricarinata* appears to be probably the female of *metopiiiformis* MORLEY.

The two Formosan species may be separated by the following key:

Tergites 1 to 4 with a sharp median carina; a large robust species with thorax immaculate laterally *formosana* n. sp.

Tergites 1 to 4 without median carina except at extreme base of 2 to 4; a very slender species with thorax highly ornamented laterally
..... *gracilis* n. sp.

***Apophus formosana* n. sp.**

Very close to if not identical with *carinata* MORLEY, but the scutellum and frons are coarsely and rather densely punctate. Also I am in doubt whether MORLEY'S species has the median abdominal carina extending into the apex of the first tergite since he does not mention it and in describing *metopiiiformis* he ascribes it to the latter species, while his figure seems to indicate that *metopiiiformis* also has it on the second to fourth tergites. The present species has it strongly developed.

Female—Length 8 mm.; antennae 8 mm.; ovipositor 5 mm.

Head in front view subtriangular, strongly constricted and narrowed below the prominent eyes, in dorsal view with temples so strongly receding as to be nearly perpendicular to longitudinal axis of body; face medially elevated, coarsely, obliquely rugoso-punctate; clypeus with the transverse elevation prominent, polished and sparsely punctate basally, finely coriaceous apically, about as long as interfoveal line, malar space slightly shorter than basal width of mandible; occipital carina narrowly interrupted medially; frons densely and coarsely punctate, cheeks more finely and sparsely so; vertex and temples polished impunctate. Thorax dorsally coarsely, transversely rugoso-punctate, laterally more finely and sparsely punctate; pronotum punctate above, polished below, impression foveolate, epomia strong nearly to upper margin; prescutum with a shallow median groove; notauli shallowly indicated; scutellum coarsely and densely punctate, elevated medially as though compressed from the sides; mesosternum rather finely, densely punctate, the punctation becoming more sparse on the pleura, speculum impunctate; metapleurum with coarse separate

punctures; propodeum transversely rugoso-punctate, especially in middle; areola twice as long as broad, costulae before middle; spiracles broadly oval, discocubitus sinuate; second recurrent with bulla interrupted; nervellus reclivous; legs slender; abdomen broad, first tergite fully a half broader at apex than at base, second to fourth distinctly wider than long, these four tergites longitudinally coarsely striato-punctate and with a sharp median carina extending from middle of first to apex of fourth; other tergites smooth and strongly retracted; ovipositor as long as abdomen.

Black, the thorax laterally and propodeum piceous, with the following yellow markings: clypeus, mandibles, scape and pedicel beneath, anterior and superior margins of pronotum, scutellum, base of tegulae, base and apex of first tergite and apices of all other tergites; antennae fuscous, slightly paler beneath; wings hyaline, venation blackish, radix yellow; tegulae apically brown; legs testaceous, front and middle coxae and trochanters stramineous, hind femur at apex, tibia at base and apex, and tarsus black, tibia otherwise stramineous.

Male—Like the female except larger.

Type-locality—Kankau (Koshun), Formosa.

Paratype—No. 43908, United States National Museum.

Described from the type female, allotype male, and five other males and one other female, all from the type-locality but the paratype female, which is from Sokutsu, Banshoryo District, Formosa.

Two of the paratype males are nearly like the type and allotype in color though showing less of the piceous color, while the other four specimens lack this color entirely and have the yellow markings, especially of the pronotum and base of first tergite, less extensive. These black specimens have a quite different appearance from the others, but are not structurally different. They differ further in having the tegulae and antennae black, while the tergites beyond the fourth are at most distinctly margined with yellow.

Four paratypes, one female and three males, are retained for the United States National Museum.

***Apophua gracilis* n. sp.**

Differs from the more typical species in that the median abdominal carina is confined to the extreme bases of tergites 2-4, in the somewhat finer sculpture, especially of the abdomen, and in the slender form.

Female—Length 9 mm.; antennae 6.5 mm.; ovipositor 7 mm.

Head in front view broader than long, subtriangular, strongly constricted below eyes, cheeks straight, in dorsal view with temples nearly perpendicular to longitudinal body axis; face convex medially and slightly swollen laterally above

the clypeal foveae, densely and coarsely punctate medially, more sparsely so laterally; clypeus entirely confluent with face, polished, the transverse ridge obsolete; malar space subequal to basal width of mandible; frons, vertex, and cheeks with large separated punctures; temples and occiput polished, occipital carina very broadly interrupted medially. Thorax and propodeum with strong, distinct, separated punctures, densest on metapleurum and apical face of propodeum; lower angle of pronotum and speculum polished impunctate; lateral impression of pronotum obsoletely foveolate, epomia strong nearly to upper margin, which is hardly callose; notauli rather strongly, shortly impressed; scutellum not elevated medially, simply convex; areola hardly twice as long as broad, costulae before middle, it and the basal area sparsely punctured; discocubitus arched; nervellus inclivous; legs very slender. Abdomen very slender, gradually narrower from second tergite, first four tergites much longer than wide; first tergite about twice as long as wide at base, apex barely a third wider than base, dorsal carinae reaching practically to apex, the space between impunctate for two-thirds its length, lateral areas sparsely punctate, apex densely, so; tergites 2 to 4 very densely, subrugosely punctate, opaque, with very short median carina at base, the oblique grooves very deeply and sharply impressed; remaining tergites impunctate; ovipositor sheath slightly longer than abdomen.

Black with the following yellow markings: face, except small median spot, clypeus, mandibles, cheeks, pronotum, except in impression, propleura, tegula, spot below, scutellum, postscutellum, broad oblique mark on mesopleurum, both lower and upper portions of metapleurum, posterior face of propodeum, and apices of first three tergites; antennae black, scape and pedicel pale beneath; wings hyaline, venation blackish, radix yellow, legs testaceous, the coxae and trochanters above more or less yellow, those of front legs nearly entirely so, hind tibia and tarsus infusate at apex.

Male—Length 8 mm.; antennae 8 mm.

Like female except that antennae are relatively longer, and the yellow markings of the thorax and propodeum are little more extensive.

Type-locality—Kankau (Koshun), Formosa.

Paratype—No. 43909, United States National Museum.

Described from six females and five males all from Formosa; the type, allotype, and one female paratype from the type-locality; two females and three males from Taihorin; one female from Anping; and one of each sex from Suisharyo.

Three paratype females and two paratype males are retained in the United States National Museum.

Genus *Glypta* GRAVENHORST

Very few species from the Oriental region have been referred to this genus, and of these only one, *Glypta nursei* CAMERON, which MORLEY synonymizes with the British *nigrina* DESVIGNES, certainly belongs here, the others being apparently more properly referred to *Apophlva* MORLEY.

The new species described below differs from *nigrina* in its possession of a distinct median frontal horn. This would place it in *Conoblasta*, which I consider not of generic rank because of the very great variation in the size of the horn even within a species.

Glypta orientalis n. sp.

Female—Length 8 mm.; antennae 8 mm.; ovipositor 4.5 mm.

Head in front view broader than long, subtriangular, constricted below eyes, with malar space nearly as long as basal width of mandible, finely punctate; face medially elevated; clypeus convex, separated from face, punctate basally; mandibles basally convex; frons with a distinct median horn; temples sharply receding, flat. Thorax closely punctate, only the speculum impunctate; notauli obsolete; propodeum with the usual areas indicated, but the costulae and the longitudinal veins behind them obsolete, areola elongate, narrowed basally, costulae before middle. Abdomen slender, first three tergites much longer than broad; first with carinae reaching to beyond middle and an obsolete median carina at apex; tergites 2-4 with oblique grooves deep; first four tergites very densely punctate, except first between carinae; ovipositor as long as abdomen or a little longer.

Black with only apical half of clypeus, mandibles, humeral spot, tegulae, radices of wings, and legs pale; legs pale testaceous, all coxae and trochanters and extreme base and middle of hind tibia paler, hind tibia otherwise and tarsus fuscous; wings hyaline, venation black.

Type-locality—Suisharyo, Formosa.

Paratype—No. 43910, United States National Museum.

Two females.

Phytodietus spinipes (CAMERON) (new combination)

Rhorus spinipes CAMERON, Spolia Zeylanica, 1905, p. 132.

Phytodiaetus capuae MORLEY, Fauna Brit. India, Hym., vol. 3, pt. 1, 1913, p. 220.

Rhorus spinipes MORLEY, Ibid., p. 337.

Phytodiaetus spinipes MORLEY, Ann. & Mag. Nat. Hist., ser. 8, vol. 14, p. 400; vol. 16, 1915, p. 337.

Phytodiaetus capuae SONAN, Taiwan Nojiho, 180, 1921, p. 611; UCHIDA, Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, 1928, p. 96.

There appears to be no reason to doubt that the onespecimen taken by SAUTER at Chosokei, Formosa, is properly referred to the present species. SONAN has previously recorded it from Formosa as a parasite of *Homona men-ciana* WALKER.

It is quite obvious that MORLEY fell into a *Lapsus calami* when he transferred the species to *Phytodiaetoides* and synonymized with it the type of that genus, *Phytodiaetoides megaera* MORLEY. Comparison of the description of *spinipes* and *megaera* shows very little in common. It is almost equally as obvious that MORLEY intended to transfer *spinipes* to *Phytodiaetus* and to synonymize with it his own *P. capuae*, the description of which stands immediately before that of *Phytodiaetoides megaera* and corresponds very closely with the description of *spinipes*.

***Phytodiaetus pallidus* n. sp.**

Remarkable for its color which is pale yellow, spotted and banded with black.

Female—Length 11 mm.; antennae 12 mm.; ovipositor sheath 4.5 mm.

Temples very strongly receding, weakly convex; diameter of ocellus distinctly shorter than postocellar line and a little longer than ocell-ocular line; face and frons polished and very minutely punctate, a deep impressin on each side between eye and antennal foramen, the two converging and fading out below; eyes slightly divergent below antennae; clypeus moderately convex, with a narrow reflexed margin, weakly emarginate medially at apex; malar space about two-thirds as long as basal width of mandible, the latter with upper tooth much larger and longer than lower; antennae very slender, filiform, 42-jointed. Thorax subpolished, very minutely punctate; epomia distinct; notauli sharply impressed anteriorly; posterior two-thirds of propodeum transversely striate and margined on each side by a sharp carinate ridge; legs long and slender, tibiae with scattered long spines, inner hind calcarium about half as long as basitarsus. Abdomen very minutely and densely pubescent, slender, first tergite more than a half longer than broad at apex, second longer than broad at base.

Pale yellow with black markings as follows: an elongate spot in middle of face, frontal scrobes stemmaticum, a spot on each side of upper temples confluent with a median dorsal spot on occiput, a large sagittate spot on each side of pronotum and a smaller spot on each side of middle, a stripe on each lobe of mesoscutum, the lateral ones confluent behind with a spot in the scutellar fovea, lateral areas of scutellum, a spot in the speculum and a very small one near upper margin of mesopleurum, anterior margin of mesosternum and a large spot on each side apically, a triangular spot along metapleural suture, a large

transverse mark at base of pronotum explanate outwardly and narrow medially and a bilobed apical spot, a transverse band on each abdominal tergite, that of the first near the middle, the others near the base, those of second and third tergites running down onto epipleura, a pair of spots on sternite of second segment and two pairs on that of third segment, a median spot on hypopygium, and narrow basal margins of other sternites; antennae black, paler below toward base, the scape yellow; legs testaceous or ferruginous with coxae yellow, dorsal and ventral spots on hind coxae black, underside of femora more or less brownish, hind tarsus blackish; wings yellowish hyaline, venation brown, stigma and costa ferruginous; ovipositor sheath black with extreme apex reddish.

Type locality—Taihorin, Formosa.

One specimen.

Polysphincta taiwanensis n. sp.

Female—Length 6 mm.; antennae 4.5 mm.

Smooth and polished except metapleurum and sides of propodeum, which are roughly opaque; temples strongly receding, weakly convex; eyes strongly convergent below, weakly sinuate opposite antennae; face longer than broad at top, very finely and sparsely punctate and with a shallow longitudinal impression each side of middle; clypeus convex at base, broadly rounded at apex; malar space shorter than basal width of mandible; antennae very slender, 25-jointed, first joint of flagellum a half longer than second. Thorax not nearly twice as long as deep; notauli very deep and finely foveolate; mesosternum finely punctate, prepectus more coarsely so; propodeum with median carinae nearly parallel and extending from base to apical carina, the latter not interrupted medially but terminating at lateral carinae, which are developed only from this point backward; legs unusually slender and very long; radius and cubitus contiguous; nervulus postfurcal and declivous; nervellus unbroken. Abdomen polished, slender; first tergite twice as long as broad at apex, with an oblique impression on each side at apex, dorsal carinae strong nearly to apex; second tergite as long as broad at apex, with oblique basal and apical furrows setting off a rhomboid median elevated area; tergites 3 and 4 of similar structure but less distinctly so; ovipositor sheath as long as first tergite.

Piceous black; antennae fuscous, paler below at base; clypeus reddish apically; mandibles and palpi whitish; tegulae, radices, front and middle coxae, and all trochanters stramineous; hind coxae piceous; hind tibia annulated with fuscous and stramineous; legs otherwise testaceous, the hind tarsi somewhat infusate.

Type-locality—Kosempo, Formosa.

Paratype—No. 43911, United States National Museum.
Two females.

Genus ***Polemophthorus*** SCHULZ

Symphylus FOERSTER, Verh. Naturh. Ver. preuss. Rheinland, vol. 28, 1871, p. 105 (pre-occupied).

Polysphincta (*Symphylus*) THOMSON, Opusc. Ent., fasc. 12, 1888, p. 1251.

Polemophthorus SCHULZ, Zool. Annal., vol. 4, 1911 (1909), p. 22.

If THOMSON was correct in allying this genus with *Polysphincta*, the following species certainly is referable to it. It differs from the original description, however, in having the first flagellar joint much longer than the second, the upper tooth of the mandible distinctly longer than the lower tooth, the tarsal claws in the female with a strong basal tooth, and the spiracles of the first tergite distinctly before the middle.

The prescutal cristulae are exactly analogous to those of *Colpomeria*, though less conspicuous, and the front and middle femora are somewhat thickened in the middle, though much less distinctly so than in *Colpomeria*. In other words, it is almost exactly intermediate between *Colpomeria* and *Polysphincta*.

Polemophthorus orientalis n. sp.

Female—Length 4.5 mm.; antennae 4.0 mm.

Head polished, unsculptured; temples strongly receding, weakly convex; strongly arched above level of eyes; face with rather dense, short pubescence; clypeus fully as long as broad with apex sharply rounded, pubescence longer than that of face; combined face and clypeus distinctly longer than broad; eyes slightly convergent below; malar space nearly as long as basal width of mandible; antennae slender, 24-jointed, first joint of flagellum fully a half longer than second, all joints at least twice as long as thick. Thorax slender, about twice as long as deep; pronotum and mesothorax throughout polished, only the lower mesopleurum and sternum scarcely and finely punctate and pubescent; prescutum prominent with small cristulae anteriorly; metapleurum and pleural areas of propodeum rugose, opaque, lateral and petiolar areas polished, the latter with a median carina, areola long and narrow, its sides parallel, transversely rugulose; intercubitus much shorter than second abscissa of cubitus; nervellus broken at lower third; legs long and slender, the front and middle femora slightly thickened in the middle; apical tarsal joints very thick, that of hind leg nearly as long as second joint. Abdomen slender, polished and impunctate, more densely pubescent toward apex than toward base; first tergite about twice as long as broad at apex; only slightly broader at apex than at spiracles finely roughened and opaque except the polished apical callose edge which is set off by an ob-

lique groove on each side, dorsal carinae strong to the oblique grooves, close together, spiracles distinctly before middle, sternite rugose, extending a little beyond spiracles; second tergite as long as broad at apex, much broader at apex than at base, with a rhomboid median elevated area, the delimiting grooves weakly striate; tergites 3-5 slightly transverse, parallel-side, 3 similar in structure to 2 but the furrows shallower and polished, 4 and 5 with traces of similar areas and grooves; ovipositor sheath a little more than half as long as first segment.

Piceous black, the pleura more reddish; clypeus apically reddish; mandibles, palpi, and under-side of scape at apex whitish; wings hyaline, venation brown, radices, tegulae, and humeral angles of pronotum whitish; legs testaceous, front and middle coxae and all trochanters stramineous, hind tibia fuscous at base and apex, stramineous in middle, the same pattern repeated on middle tibia but less distinctly, tarsi fuscous.

Type-locality—Taihorin, Formosa.

One female.

Genus *Epirhyssa* CRESSON

Epirhyssa CRESSON, Proc. Ent. Soc. Phil., vol. 4, 1865, p. 39.

Ahyborhyssa ENDERLEIN, Sitz. Ges. Naturf. Freunde, Berlin, 1919, p. 152, part.

ENDERLEIN established his genus *Ahyborhyssa* for the Oriental species that had previously been referred to *Epirhyssa* CRESSON, giving as the only character for distinguishing it the weakly convex prescutum as opposed to the subpyramidal prescutum of *Epirhyssa*. As type he selected *Epirhyssa annulicornis* CAMERON, the only species among those listed not properly referable to the genus he intended to found, and a species which MORLEY had already (Fauna Brit. India, Hym., vol. 3, 1913, p. 80) properly transferred to *Xylonomus*. *Ahyborhyssa*, therefore, falls as a synonym of *Xorides* Latreille (= *Xylonomus* GRAV.), or, if the various Oriental segregates of *Xorides* are to be recognized as good genera, it will go into synonymy with *Cyanoxorides* CAMERON (1903).

This leaves the rest of the Oriental species transferred by ENDERLEIN to his genus without generic name except *Epirhyssa*, and here I prefer to leave them until I have opportunity to compare Oriental and Neotropical species. In any event I doubt the reliability or value of the single character cited by ENDERLEIN for separating the species from the two regions.

No species of the genus from Formosa has been hitherto recorded, nor have I been able to reconcile any of the six species included in the SAUTER collection with any of the published descriptions.

The six Formosan species may be distinguished by the following key;

1. Propodeum with petiolar area defined by a distinct carina; very small species 2
 Propodeum with at most faint traces to the apical carina..... 3
2. Nervulus postfurcal; frons with a single median carina; black of vertex and occiput confluent *minuta* n. sp.
 Nervulus antefurcal; frons with two carinae medially; black of vertex and occiput separated by a broad yellow band *carinata* n. sp.
3. First tergite long and narrow, more than twice as long as broad, its spiracles far from base; propodeal spiracles very large and elongate ...
 *longibasis* n. sp.
 First tergite short and broad, much less than twice as long as broad, its spiracles near base; propodeal spiracles small, oval 4
4. Ferruginous and yellow; mesoscutum medially with two small yellow marks *rufescens* n. sp.
 Black and yellow; mesoscutum with a large yellow median spot 5
5. Face sparsely punctate; frons virtually impunctate and medially flat ...
 *transversa* n. sp.
 Face transversely rugoso-punctate; frons laterally distinctly punctate and with a carinately defined semicircular impression below ocelli.....
 *diversa* n. sp.

***Epirhyssa minuta* n. sp.**

This and the next species differ from all the other species from Formosa and from most of the other species that I have seen in the possession of a complete apical carina on the propodeum and in their very small size.

Female—Length 9.7 mm.; antennae 6.5 mm.; ovipositor sheath 10.5 mm.

Head rather thick from front to back; temples narrower than eyes but extending nearly straight backward; vertex sparsely punctate laterally, rugulose medially; ocellar triangle very strongly transverse, postocellar line much longer than ocell-ocular line; ocelli very small, their diameter little more than half as long as ocell-ocular line and less than one-third postocellar line; frons tumid and distinctly punctate laterally, deeply concave and polished medially and with a median longitudinal carina; face slightly narrower than frons, densely and coarsely punctate; clypeus small, truncate at apex; mandibles short and broad, bidentate; malar space three-fourths as long as basal width of mandible; antennae 27-jointed, thickened toward apex. Thorax much less than twice as long as deep; pronotum distinctly punctate only above; prescutum high with strong rugae, vertically precipitate in front, notauli distinct only anteriorly; scutellum with a subbasal transverse carina, the surface behind this densely punctate;

mesopleurum sparsely punctate below, more finely so above, polished between; prepectus and sternum more finely and densely punctate; metapleurum very sparsely punctate, propodeum rather densely punctate especially laterally, petiolar area polished and impunctate, surrounded by a distinct, semicircular carina, spiracles small, oval; legs very slender; second recurrent distinctly postfurcal; nervulus interstitial; nervellus broken well below mediella. Abdomen coarsely and densely punctate especially on tergites 4-6; first tergite very short, polished and nearly impunctate; second distinctly longer than first, punctate basally, polished apically; third sculptured nearly like second; tergites 3-5 with subbasal and subapical transverse furrows, the subbasal ones only lateral; spiracles of seventh tergite small and broadly oval.

Black and yellow; orbits broadly, with interruptions on vertex and in malar space, and face except a fusiform median spot yellow; clypeus testaceous; antennae fusco-rufous, paler beneath. Pronotum, except in scrobe and in posterior middle, a large median keystone-shaped mark on mesoscutum and small lines opposite tegulae, scutellum except at apex, its basal carinae, mesopleurum except narrow peripheral margins and a large spot in middle, propodeum and metapleurum except periphery and petiolar area, and all coxae except underside of hind coxa yellow; legs beyond coxae testaceous; hind tarsi fusco-rufous; wings hyaline, venation, except costa, brown. Tergites broadly black at base and narrowly so at apex, broadly yellow between; the yellow on tergite 6 and 7 abruptly narrowed or interrupted medially by triangular extensions of the basal band, and extending along lateral margins to base; last tergite yellow only along lateral margins; venter yellow with oblique brownish markings extending laterally from the median tubercles; ovipositor sheath dark ferruginous, black at extreme apex.

Type-locality—Kankau (Koshun), Formosa.

One specimen.

Epirhyssa carinata n. sp.

Female—Length 11 mm.; antennae (broken); ovipositor sheath 11 mm.

Closely related to *minuta* CUSHMAN, but differing from that species as follows: Temples convexly receding; ocelli larger, much more than half as long as ocell-ocular line and more than one-third postocellar line; frons less deeply concave and bicarinate medially; face more coarsely punctate; pronotum distinctly punctate below; mesopleurum densely and more coarsely punctate, as is also the sternum, metapleurum coarsely and rather densely punctate; apical carina of propodeum emarginate medially; nervulus distinctly antifurcal; tergites 2 and 3 more densely punctate apically and each with a median, longitudinal,

impunctate area basally.

Yellow of posterior orbits extending entirely across vertex behind ocelli; propleura and mesosternum entirely yellow; hind coxa not at all black, but with a reddish stain on each side; all yellow bands of abdomen constricted medially by posterior extensions of the basal black bands; last tergite yellow at apex.

Type-locality—Kankau (Koshun), Formosa.

Type—Deutsche Entomologisches Museum.

One specimen.

Epirhyssa longibasis n. sp.

Very distinct from the other Formosan species in its long, narrow first abdominal segment and large elongate propodeal spiracles and from all except the next following species in its ferruginous ground color.

Female—Length 16 mm.; antennae (broken); ovipositor sheath 22 mm.

Head thin, less than half as thick as broad; temples very strongly narrowed, convex; vertex sparsely punctate behind ocelli; ocellar triangle moderately transverse, postocellar line hardly as long as ocell-ocular line, ocelli rather large, diameter fully two-thirds as long as postocellar line and more than half ocell-ocular line; frons polished, impunctate, weakly concave medially; face medially distinctly but not densely nor coarsely punctate, more or less rugulose above, fully as long as broad and much narrower than frons; clypeus small, weakly trilobed at apex; mandibles bidentate; malar space little more than half as long as basal width of mandible. Thorax nearly twice as long as deep; pronotum polished, weakly, sparsely punctate above; prescutum low and roundly sloping in front, the anterior rugae weak; notauli nearly meeting just before middle of mesoscutum; scutellum transversely rugulose; mesopleurum polished, very sparsely but rather coarsely punctate in middle, prepectus and sternum somewhat more densely and finely punctate; metapleurum sparsely punctate, propodeum a little more densely so, with a basal median groove, petiolar area not carinately limited, polished, spiracles large, elongate; legs moderately slender; second recurrent shortly postfurcal; nervulus interstitial; nervellus broken very near top. Abdomen basally polished and sparsely punctate, apically opaque with a mixture of dense, fine punctation and fine transverse aciculation; first tergite more than twice as long as broad at apex, its sides straightly diverging from base to apex, spiracles at basal third; second tergite longer than broad, not longer than first; tergites 3-5 with shallow subapical transverse furrows and a shallow impression in middle on each side, 4 and 5 with distinct tubercles; spiracles of tergite 7 large, elongate.

Ferruginous and yellow; face, clypeus, and broad orbits with interruption

at top of eyes yellow; antennae ferruginous at base (only 10 joints of left antenna present); upper and lower margins of pronotum, two median lines and two lateral lines on mesoscutum, scutellum, mesopleurum largely, metapleurum and propodeum except sutures and petiolar area, front and middle coxae and dorsal surface of hind coxa and basal joints of trochanters yellow; mandibles apically, median posterior spot on pronotum, spot in middle of mesopleurum, thoracic sutures, and petiolar area piceous; legs testaceous, apices of femora more or less yellow; wings yellowish hyaline, immaculate, veins black, stigma and costa testaceous; tergites 1-6 each with a poorly defined subapical band of yellow; 7 and 8 largely yellow; ovipositor sheath blackish, ferruginous at base and extreme apex.

Type-locality—Hoozan, Formosa.

One specimen.

Epirhyssa rufescens n. sp.

Very similar general structure and color to *longibasis* CUSHMAN, but the spiracles of the propodeum and seventh segment are much smaller and broader and the first two tergites are relatively much broader.

Female—Length 14 mm.; antenna 11 mm.; ovipositor sheath 14 mm.

As in *longibasis* except that postocellar and ocell-ocular lines are subequal and the diameter of an ocellus is about two-thirds as long as either; frons with a few transverse striae below ocelli; face much more finely punctate; pronotum more coarsely punctate above; metapleurum punctured like sides of propodeum; propodeal spiracles smaller and more broadly oval; nervulus slightly postfurcal; abdomen more coarsely punctate apically and without transverse aciculation; first tergite much less than twice as broad as long and abruptly constricted basad of spiracles, which appear to be nearer to base; second tergite broader than long and a little longer than first; lateral impressions of tergites 3-5 and tubercles of 4-5 less distinct, the latter virtually absent; spiracles of tergite 7 broadly oval.

Color similar to that of *longibasis*, but pronotum except piceous spot in basal middle entirely yellow; sides of prescutum indefinitely yellow; mesopleurum except sutures entirely yellow; sternum barely more reddish; yellow bands on tergites more distinct, that of sixth interrupted medially. Antennae entirely ferruginous; all coxae more or less testaceous below, only front trochanters yellow; wings with a small apical cloud; sheath nearly ferruginous.

Type-locality—Kosempo, Formosa.

One specimen.

Epirhyssa transversa n. sp.

Female—Length 18 mm.; antennae (broken); ovipositor sheath 21 mm.

Head moderately thick, barely more than twice as broad as thick, distinctly narrower behind eyes, but the temples extending straight back; vertex rather densely punctate behind ocelli; ocellar triangle strongly transverse, postocellar line a half longer than ocell-ocular line, diameter of an ocellus half as long as postocellar line; frons slightly tumid and with scattered small punctures laterally, weakly concave and without sculpture or carinae medially; face slightly narrower than frons, nearly as long as broad, rather coarsely but not densely punctate, lower corners impunctate; clypeus small, arcuately emarginate at apex; mandibles bidentate; malar space two-thirds as long as basal width of mandible. Thorax nearly twice as long as deep; pronotum finely and sparsely punctate above and posteriorly; prescutum with a median groove, strongly gibbous anteriorly, the anterior rugae small; notauli not extending to middle; scutellum finely punctate basally and laterally, transversely rugulose medially; mesopleurum sparsely punctate below, prepectus and sternum more finely and densely so; metapleurum and sides of propodeum moderately densely punctate, middle of propodeum impressed and impunctate, petiolar area impressed and limited above by faint traces of the apical carina, spiracles oval; legs not especially slender; second recurrent interstitial; nervulus strongly antefurcal; nervellus broken very near the top. Abdomen mostly finely and densely punctate, first tergite virtually impunctate, second sparsely and more coarsely punctate; first tergite little longer than broad, abruptly narrowed before spiracles; second about as long as broad at apex; tergites 3-5 with impressions and tubercles obsolete; spiracles of seventh tergite elongate oval, rather large.

Black and yellow; head yellow with only a transverse mark on vertex from eye to eye and extending part way down middle of frons, a large mark on each side of occiput extending narrowly along the carina, malar space, and mandibles black; antennae (only the first four joints of left antenna are present) blackish, flagellum ferruginous below. Pronotum, except a small median posterior spot, yellow; mesoscutum black with a very large median oblong spot with anterior and posterior angles projecting beyond the general outline and broad stripes above tegulae yellow; scutellum and its basal carinae yellow; postscutellum piceous, its lateral extremities and more or less of the impressed portion yellow; mesopleurum and sternum and metapleurum and propodeum except along anterior and posterior margins and petiolar area, yellow; all coxae, except apex of hind coxa, yellow; hind trochanters, apical joint of median trochanter, and the femora above yellow; legs otherwise (front legs except coxae

and all tarsi except of the left middle leg are missing) testaceous with apical joint of tarsi black and base of hind femur piceous; wings hyaline, venation black, costa reddish, a faint apical cloud in front wing. Abdomen largely yellow, all tergites except eighth narrowly black at base and apex; eighth yellow only laterally, venter yellow with only the usual oblique piceous bands; ovipositor sheath fuscous, paler toward base, extreme apex ferruginous.

Type-locality—Hozan, Formosa.

One specimen.

Epirhyssa diversa n. sp.

Female—Length 14 mm.; antennae 10 mm.; ovipositor sheath 14 mm.

Very similar in general to *transversa* CUSHMAN, differing from the above description of that species only as follows: temples distinctly convex; vertex coarsely punctate between ocelli, transversely aciculate behind; ocelli much smaller, their diameter barely a third as long as postocellar line; frons more strongly tumid and punctate laterally, distinctly concave medially with a median longitudinal carina and carinately defined grooves from lateral ocelli converging below; face much broader than long, barely narrower than frons, densely punctate, transversely rugulose so medially; clypeus truncate; malar space hardly two-third as long as basal width of mandible; antennae very slightly thickened apically, 31-jointed. Prescutum without a distinct median groove, nearly perpendicular in front, the anterior rugae stronger; scutellum punctato-rugulose throughout; mesosternum very sparsely punctate; propodeum without trace of apical carina; legs rather stout; second recurrent slightly postfurcal; nervellus not broken, the subdiscoidella virtually interstitial with mediella. Tergites 1-3 virtually impunctate; 4-7 coarsely and densely punctate; 4-5 with rather deep subbasal and subapical transverse furrows; 2 distinctly broader than long.

Color pattern nearly the same as in *transversa*: clypeus narrowly black at base; black of vertex broadening below on frons and reaching antennal foramina; occiput with a median black spot that spreads narrowly along the carina; flagellum ferruginous, more fuscous above; prescutum yellow anteriorly; postscutellum yellow; mesopleurum with a black spot anteriorly; stigma pale at base; tarsi entirely testaceous; last tergite entirely yellow except extreme apex.

Type-locality—Kosempo, Formosa.

One specimen.

Megarhyssa superbians (MORLEY) (new combination)

Thalessa superbians MORLEY, Rev. Ichn. Brit. Mus., part 2, 1913, p. 18.

One female from Kankau (Koshun) appears to be referable to this species.

Apparently it is nothing more than a pale form of *japonica* ASHMEAD.

Genus *Exeristes* FOERSTER

None of the three species referred below to this genus is typical of the genus, but they and many other species from the Oriental Tropics run here in any of the available keys to the genera of Ichneumoninae.

The temples are much more strongly receding, the head and thorax are weakly or not at all punctate, the propodeum is entirely without carinae, and the first tergite is relatively longer with a much smaller portion of its dorsal surface embraced in the anterior concave area. As a group these species are about as distinct from typical *Exeristes* as is *Charitopimpla* from *Epiurus*. Apparently, however, there is no extant generic name for them other than *Exeristes*, and I am disinclined to add to an already long list of doubtfully valuable generic names.

Among these species there are two rather distinct groups. In one group the species are stout, yellow with black markings, and have the propodeum entirely without sculpture. In the other group all of the species are more slender, black and red in various arrangements of the two colors, and have the propodeum always coarsely punctate.

The following key will serve to distinguish the three species represented in the SAUTER collection.

1. Yellow with black markings..... *nigromaculatus* (CAMERON)
 Black, with or without reddish markings 2
2. Abdomen with reddish transverse bands *sauteri* n. sp.
 Abdomen without reddish bands *gracilis* n. sp.

Exeristes nigromaculatus (CAMERON) (new combination)

Ephialtes nigromaculatus CAMERON, Mem. and Proc. Manch. Lit. Phil. Soc., vol. 43, No. 3, 1899, p. 150.

? *Calliephialtes xanthosoma* MORLEY, Faun. Brit. India, Hym., vol. 3, Ichn., part 1, 1913, p. 86, fig. 18.

Ephialtes nigromaculatus CAMERON, MORLEY, loc. cit., p. 179, fig. 41.

There is one mutilated female in the SAUTER material that I am confident is CAMERON's species and almost as certain is the opposite sex of MORLEY's. So far as I am able to interpret CAMERON's confusing description this specimen agrees with it except that the face is immaculate; the black marks of the second to fifth tergites are narrowly confluent, the sixth has four, the seventh two, and the eighth one; and the middle and hind trochanters are black basally instead of apically.

***Exeristes sauteri* n. sp.**

Female—Length 14 mm.; antennae 8 mm.; ovipositor sheath 8 mm.

Head polished, with only the face distinctly punctate, frons very sparsely and finely so; temples convexly strongly sloping, in length antero-posteriorly about half short diameter of eye; diameter of an ocellus equal to postocellar line and three-fourths as long as ocell-ocular line; face a little broader than long, parallel-sided, with long pubescence except in a median band; clypeus irregularly roughened except at base where it is finely, sparsely punctate, clothed with very long hairs; malar space less than half basal width of mandible; antennae slender, 32-jointed, basal joint of flagellum four times as long as thick. Thorax nearly twice as long as deep, polished, with rather long white hairs; pronotum impunctate and glabrous; mesoscutum sparsely distinctly punctate, prescutum rather prominent; scutellum more coarsely punctate; mesopleurum below and anteriorly with very weak, sparse punctation; metapleurum with a few small punctures; propodeum coarsely punctate, a narrow median band and the apical face polished and impunctate, without carinae, spiracles broadly oval; radius at middle of the rather narrow stigma, its apical abscissa strongly curved at base; areolet long, weakly narrowed toward apex; nervellus broken just below upper third; legs stout, hind femur four times as long as deep, apical joints of tarsi and claws unusually stout. Abdomen narrowly fusiform, coarsely punctate, first tergite shorter than second, nearly as long as broad, anterior basin hardly a third of the length of upper surface, tubercles prominent, sutures deeply constricted, apices of tergites narrowly smooth and polished.

Black; scape and pedicel below, palpi, humeral margins of pronotum tegulae, front and middle coxae, and trochanters yellowish; mandibles reddish piceous; legs otherwise ferruginous; wings yellowish hyaline; venation black; tergites 2-4 with broad preapical rufous bands, fifth with a narrow band of rufous, first obsoletely rufous apically, sixth and seventh narrowly yellowish at apex.

Male—Length 7 mm.; antennae 5 mm.

Much smaller and more slender than female; temples broader and less strongly convex; pale color of abdomen more extensive and more yellowish; otherwise essentially like female. Apparently an undersized specimen.

Type-locality—Kankau (Koshun), Formosa.

Allotype—No. 43912, United States National Museum.

The male is retained for the United States National Museum.

***Exeristes gracilis* n. sp.**

Very similar to *sauteri* CUSHMAN but more slender and abdomen without rufous bands.

Female—Length 11 mm.; antennae 7.5 mm.; ovipositor sheath 8.5 mm.

Differs from the above description of *sauteri* only as follows: diameter of an ocellus little more than half as long as ocell-ocular line; face as long as broad and slightly narrowing below; antennae more slender, 30-jointed, basal joint of flagellum fully five times as long as thick. Thorax distinctly more than twice as long as deep; propodeum punctate throughout above, impunctate only apically, spiracles nearly circular; apical abscissa of radius weakly curved at base; legs more slender, the hind femur fully five times as long as deep. Abdomen virtually parallel-sided, first and second tergites a little longer than broad, the anterior basin of first relatively a little longer.

Scape and pedicel reddish piceous; hind tibia infuscate on extensor surface; tergites 3-6 narrowly pale laterally; but without rufous bands.

As shown by the measurements the antennae and sheath are relatively longer than in *sauteri*.

Type-locality—Taihorin, Formosa.

One female.

Genus *Philopsyche* CAMERON

A genus displaying remarkable uniformity in the structure, sculpture, and color of its species. All of the species except the African *abdominalis* MORLEY are black with the abdominal tergites margined with white, the front and middle legs very largely or entirely pale yellow or stramineous, and the hind tibiae alternately yellow and black. The head is strongly transverse in both dorsal and face views, the eyes and ocelli large, the eyes deeply emarginate, the malar space nearly obliterated, and the antennae stout and from 35-40 jointed, the variation in number of joints being more closely associated with variation in size than with specific identity. The thorax is short and stout with the notauli distinct anteriorly, and the propodeum entirely without carina and with rather large oval spiracles. The abdomen is narrowly fusiform with the tubercles and impressions very distinct and the ovipositor always shorter than the abdomen. The sculpture consists of coarse punctation, densest on the mesoscutum and absent over most of the pronotum and metapleurum and along the posterior margin of mesopleurum. The body is clothed with long conspicuous pubescence, longest and densest on propodeum.

The legs are rather stout with the claws large and, in female, strongly dentate.

The best specific characters appear to be found in the size of eyes and ocelli with the resulting differences in width of face and ocell-ocular spaces, in the color of the hind legs and, to some extent, that of the abdomen.

This genus is related to *Charitopimpla*, differing mainly in the more strongly emarginate and convergent eyes, and in color pattern.

The one species represented in the SAUTER collection may be distinguished from the described species as follows:

- | | |
|---|-----------------------------|
| 1. Hind coxae red (Ceylon) | <i>albobalteata</i> CAMERON |
| Hind coxae black | 2 |
| 2. Hind femur more or less red (Formosa) | <i>sauteri</i> n. sp. |
| Hind femur entirely black | 3 |
| 3. Hind tibia black only at apex (New South Wales) | <i>pilosella</i> CAMERON |
| Hind tibia with a subbasal black annulus (New South Wales)..... | |
| | <i>annulipes</i> CAMERON |

***Philopsyche sauteri* n. sp.**

Female—Length 15 mm.; antennae (broken); ovipositor 6.5 mm.

Head from above more than twice as broad as medially thick, the temples flat and very strongly receding, polished and sparsely punctate; diameter of ocellus longer than ocell-ocular line; face less than a third total width of head, fully as long as its narrowest width, polished, sparsely and coarsely punctate, with a median longitudinal welt.

Black with under-side of scape, palpi, tegulae front and middle legs, hind trochanter largely, basal and median annuli on hind tibia, base of its tarsus, apical margins of all tergites except for a small spot on each side of tergites 2-4, and more or less of basal angles of tergites 2 and 3 whitish; middle coxae piceous above; middle tibia with a black streak on outer side near apex; hind coxa black, femur red, its extremities black, tibia with subbasal and apical annuli black, tarsus except base blackish.

Type-locality—Kosempo, Formosa.

Paratype-locality—Kankau (Koshun), Formosa.

Paratype—No. 43913, United States National Museum.

Two females.

Genus ***Charitopimpla*** CAMERON

Charitopimpla CAMERON, Jour. Straits Branch Roy. Asiatic Soc. No. 37, 1902, p. 48;

Tijd. Ent., Jahrg. 50, p. 97.

Exeristes MORLEY, Fauna Brit. Ind., Hym., vol. 3, Ichn., pt. 1, 1913, p. 195 (part);

Rev. Ichn. Brit. Mus., pt. 3, 1914, p. 24 (part).

Admittedly the distinctions between the genera of the Ichneumoninae are very narrow, especially in the series from *Ichneumon* (*Ephialtes* of authors) to *Epiurus* and *Tromatobia*; but the very narrow temples, low fracture of nerval-

lus, and comparatively short ovipositor of *Charitopimpla* should have deterred MORLEY from synonymizing it with *Exeristes*. In fact, the *Exeristes* of the Fauna of British India is a sad melange, no species of which appears really to belong there. Certainly *flavipalpis* (CAMERON) belongs to the *Ephialtes* (*Pimpla* of author) series.

Charitopimpla is the Oriental Region analogue of the Holarctic *Epiurus*, from which it is very narrowly separated structurally though more widely by color characters. From *Epiurus* the following characters will serve to distinguish it.

Head in dorsal view very thin, temples flat or weakly concave and very strongly receding, not or barely half as long as short diameter of the large eyes; scutellum very large, broader than long and very strongly convex, nearly always yellow, face always more or less, usually largely, yellow; abdomen never entirely black, either largely or conspicuously testaceous or ferruginous or, more rarely, black with tergites banded with yellow.

CAMERON referred five species to the genus, of which one, *annulipes*, has been shown by MORLEY to belong to *Philopsyche* CAMERON and to be synonymous with *Philopsyche albopalteata* CAMERON. UCHIDA has recently described a Formosan species, *Epiurus taiwanensis*, which is properly referred to the present genus. These five species together with two others from the SAUTER collection may be distinguished by the following key. The genus is known only in the female.

1. Abdomen black, the tergites margined apically with yellow
 *flavopalteata* CAMERON (Borneo)
 Abdomen always more or less reddish, the middle tergites black apically 2
2. Abdomen not black apically..... *uchidai* n. sp. (Formosa)
 Abdomen black at apex with tergites 6 and 7 usually pale at apex..... 3
3. Scutellum black *nigroscutis* CAMERON (Sikkim)
 Scutellum pale, at least in part 4
4. First tergite red, second to fourth narrowly black apically, sixth and seventh yellow at apex; clypeus yellow *leucostomus* CAMERON (Sikkim)
 *taiwanensis* (UCHIDA) (Formosa)
 First and second tergites broadly black apically, first sometimes entirely black; clypeus piceous 5
5. Mesopleurum with a yellow spot anteriorly ... *flavoscutis* CAMERON (Sikkim)
 Mesopleurum without such a spot *nigrescens* n. sp. (Formosa)

***Charitopimpla uchidai* n. sp.**

Distinct from all of the described species and from the other Formosan

species in its apically ferruginous abdomen, and from all but *flavoscutis* CAMERON in the possession of a yellow spot near anterior margin of mesopleurum.

Female—Length 9 mm.; antennae (broken); ovipositor sheath 3.5 mm

Head and thorax polished, face and mesopleurum with very sparse punctures, mesoscutum more densely but very finely punctate, propodeum rather coarsely punctate laterally, smooth and polished medially and posteriorly, with only traces of carinae at base; diameter of an ocellus longer than postocellar line; face medially weakly elevated; basal abscissa of radius hardly half as long as apical abscissa; postnervulus broken not far below middle; tarsi very short, that of hind leg little more than two-thirds as long as tibia; abdomen coarsely punctate, sparsely so on the very prominent tubercles, first tergite largely polished, with some punctation apically; first tergite about as long as broad, medially impressed in apical half, flattened on the sides; second tergite about as long as broad at base.

Head and thorax black ornamented with yellow, the propodeum reddish piceous; abdomen ferruginous, tergites 2 to 5 narrowly black or piceous apically and more yellowish laterally; the following markings pale yellow; top and sides of face broadly, mandibles, tegulae, humeral streak, subalar tubercle, a large spot at upper end of prepectus, scutellum and postscutellum except medially, where they are piceous; middle of face and clypeus piceous; antennae black, scape and pedicel yellowish below; palpi, front and middle coxae, and all trochanters stramineous as are also the front and middle femora anteriorly, the front and middle legs otherwise pale ferruginous with the extensor surfaces of the tibiae slightly infuscate; hind coxae piceous with the base above yellowish; hind femur and tibia ferruginous, the tibia pale at base and infuscate on extensor surface, tarsi pale testaceous; wings yellowish hyaline, venation black.

Type-locality—Taihorin, Formosa.

One specimen.

Named in honor of the Japanese Hymenopterist, TOICHI UCHIDA, author of an excellent review of the Ichneumniidae of Japan.

***Charitopimpla taiwanensis* (UCHIDA) (new combination)**

Epiurus taiwanensis UCHIDA, Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, 1928, p. 59, Plate II, fig. 5, ♀.

Two females, one each from Taihorin and Kosempo, agree almost exactly with the original description.

This species is very closely related to *Charitopimpla leucostoma* CAMERON from Sikkim if not synonymous with it. Apparently the ovipositor of *leucostoma* is a little longer, although this difference disappears if CAMERON's measurement

was of the entire ovipositor and not just the exerted portion. In *leucostoma*, also, the clypeus is said to have a large brown spot at apex, which may be only a stain. In any event, it seems best to hold the two distinct for the time being because of the difference in locality.

***Charitopimpla nigrescens* n. sp.**

Female—Length 12 mm.; antennae (broken); ovipositor sheath 6.5 mm.

Head polished, face very sparsely punctate and with a median broad, low, impunctate ridge, vertex and temples weakly, very sparsely punctate, diameter of an ocellus equal to postocellar line; thorax polished, laterally with only a few punctures on mesopleurum, mesoscutum more densely and very finely punctate; propodeum coarsely but not densely punctate laterally, polished and impunctate medially and posteriorly, median carinae distinct in basal fourth; basal abscissa of radius more than half as long as apical abscissa; postnervulus broken much below middle; hind tarsus about three-fourths as long as tibia; abdomen very coarsely and densely punctate, tubercles only a little less densely so and only moderately prominent; first tergite coarsely punctate except in basal impression, more coarsely and sparsely so medially; first and second tergites distinctly shorter than broad at their intersection.

Black; an inverted U-shaped mark at top of face, not reaching margins of eyes, malar space, mandibles, humeral line on pronotum, subalar tubercle, tegulae, scutellum except a short median stripe, postscutellum, front and middle coxae and trochanters, and anterior surfaces of front and middle femora yellow, those legs otherwise pale ferruginous, hind legs furruginous, trochanter and extensor surface of tibia yellowish; wings yellowish hyaline, venation black; abdomen largely black, tergites 2-5 laterally and 3 and 4 very narrowly at base yellowish testaceous, membrane of last two sutures conspicuously pale.

Type-locality—Taihorin, Formosa.

One specimen.

***Epiurus brunneus* (BRISCHKE)**

Three specimens, one female and two males, from Taihorin run directly to this species in SCHMIEDEKNECHT's "Opuscula Ichneumonologica" key to the species of *Pimpla*, and I can find no specific differences between them and specimens of *brunneus* from Europe.

***Camptotypus formosanus* (MATSUMURA) (new combination)**

Glyptogastra formosana MATSUMURA, Thousand Ins. Japan, Suppl. 4, 1912, p. 154, Pl. 52, fig. 4.

Hemipimpla rugosa UCHIDA, Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, 1928, p. 77

(not DE GEER).

I follow Roman in the use of *Camptotypus* instead of *Hemipimpla*.

If MORLEY is correct in synonymizing *Trichiothecus ruficeps* CAMERON with *rugosus* (DE GEER), then UCHIDA is wrong in synonymizing *formosana* (MATSUMURA) with *rugosus*.

One female of this genus in the SAUTER collection agrees essentially with MATSUMURA's description, and I believe is his species. It differs only in having the sixth tergite punctate rather than smooth and in the lack of yellow spots in the basal corners of the tergites (I suspect that these spots are the inter-segmental skin).

It differs from a National Museum cotype of *ruficeps* (CAM.) and two other Bornean specimens in having the face narrowing below, in its basally reddish wings and stigma, and in the pale apical margin of the sixth tergite.

***Zaglyptus formosus* n. sp.**

Female—Length 8.5 mm ; antennae (broken); ovipositor sheath 2.5 mm.

Head and thorax highly polished, virtually without sculpture, and sparsely hairy; eyes unusually large; temples weakly convex, very strongly receding, their antero-posterior length barely half the short diameter of eye; diameter of ocellus and postocellar and ocell-ocular lines subequal, stemmaticum slightly elevated, face nearly flat, with a shallow longitudinal impression on each side of middle, and with scattered obsolete punctures; clypeus very large, virtually contiguous with eyes, strongly convex, arcuately emarginate at apex; malar space very short; notauli barely indicated; propodeum polished, rather coarsely but sparsely punctate basally and laterally, the apical tubercles rather long and strongly compressed apically; stigma long and narrow, radius in middle, apical abscissa of radius straight at base, second recurrent meeting subdiscoideus at a slightly acute angle, postnervulus broken at about the middle; legs of normal length and form for the genus with the apical tarsal joints perhaps a little unusually large. Abdomen slender, coarsely punctate, the tergites callose and polished apically and with rather prominent tubercles and deep basal constrictions; first fully as long as broad, basal impression short and abrupt, tergites 6 and 7 transversely impressed.

Black, with yellow markings as follows: broad orbital rings interrupted only in malar space and very narrowly behind eyes and extending nearly to middle of face below antennae and to some distance behind ocelli; clypeus, mandibles, and palpi; lower half of propleura; collar and lower margin of pronotum; lateral margins of mesoscutum and notauli to scutellar groove; scutellum and its basal carinae and postscutellum; mesosternum, lower pleura, subalar tubercle, and along meso-metapleural suture; a large spot along upper margin of meta-

pleurum; a median elongate spot on propodeum, a large spot and, smaller one laterally at base, and the tubercles (confluent with the larger lateral spot); basal lateral angles and middle of apical margin of first tergite; subapical bands and small basal lateral spot on tergites 2-5; apical and lateral margins of tergites 6-8, medially interrupted and on 8 also at insertions of cerci; a pair of subapical spots each on tergites 3-7, round on 7 and transverse on the others (these are of different nature from the other markings, being purely superficial; on tergites 6 and 7 they are on a black ground but on 3 to 5 they are superimposed on the yellow band; they are largest on tergite 6 and smallest on 3). Antennae brownish, apex of scape and under-side of pedicel and base of flagellum yellowish; wings hyaline, venation dark brown, costa, base of stigma, and metacarpus paler; front and middle legs stramineous with femora more reddish; hind leg more reddish, the coxa stramineous except on outer side, a median superior line on femur and its apex stramineous, its base and a streak just outside of the pale line somewhat piceous; tibia testaceous above, stramineous below, with apical and subbasal blackish annuli; tarsus stramineous, with apices of first two joints blackish.

Type-locality—Taihorin, Formosa.

One female.

Genus *Ephialtes* SCHRANK

As here used this genus is equivalent to *Pimpla* GRAVENHORST in the restricted sense.

The three species included in the SAUTER collection may be separated as follows:

1. Propodeum and base of abdomen red *mesorufa* n. sp.
Propodeum and abdomen not red 2
2. Hind femur black *formosana* CUSHMAN
Hind femur red *leucogonia* n. sp.

Ephialtes formosana CUSHMAN

Ephialtes formosana CUSHMAN, Philippin Journ. Sci., vol. 20, 1922, p. 590, female.

Pimpla formosana UCHIDA, Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, 1928, p. 43, male.

Four female and two very small males (8 and 9 mm.) are included in the SAUTER collection. UCHIDA describes the hitherto unknown male, and records the species as a parasite of *Dendrolimus punctatus* WALKER.

I strongly suspect that this species will have to be synonymized with *Pimpla vitalisi* TURNER, described from Indo-China.

***Ephialtes leucogonia* n. sp.**

Evidently closely allied to (*Pimpla*) *Ephialtes flavipalpis* (CAMERON) (1) and very likely no more than a variety of that species. All available specimens, however, differ from the description of *flavipalpis* in several particulars: The palpi are reddish rather than yellow. The mesoscutum is distinctly, though very finely, punctate. The propodeum is apically polished and punctate rather than striate. The basal joints of the trochanters are reddish, more or less piceous above toward base. The front and middle tarsi are, if anything, darker rather than lighter than the tibiae. The hind coxae are entirely black. The wings are yellowish hyaline and not at all fuscous toward base.

Female—Length 11 mm.; antennae 11 mm.; ovipositor sheath 3 mm.

Eyes strongly sinuate within, slightly divergent below antennae, vertex narrow; diameter of ocellus a little longer than either postocellar or ocell-ocular line; malar space three-fourths as long as basal width of mandible; face closely punctate, slightly tumid in middle above and at each side of middle below, the median elevation impunctate; antennae 33-jointed, very slender, the first joint of flagellum fully eight times as long as thick. Thorax finely punctate, mesoscutum especially finely so and subpolished; pronotum posteriorly longitudinally striate, the striations running triangularly into the scrobe; mesopleurum partly striate above, including the speculum; metapleurum very finely obliquely striate, more coarsely so below, its upper division coarsely punctate and shining; propodeum with a longitudinal ridge on each side, transversely rugose, posteriorly polished and more or less punctate, spiracles large oval; nervellus broken at or above upper fourth and at a right, or even slightly acute, angle; legs slender, hind coxae dull, finely punctato-striate, tibia distinctly shorter than femur plus trochanter, inner calcarium nearly half as long as basitarsus. Abdomen finely and closely punctate, opaque; apical lateral angles of tergites 1-4 set off by oblique grooves, obsoletely so on 4; first tergite with dorsal carinae broad and polished, not prominent at summit.

Black; clypeus piceous; scape whitish at apex; palpi pale reddish; dorsal margin of pronotum, subalar tubercle, spots on scutellum and postscutellum, a spot on each side of apex of propodeum and apical angles of tergites 1-6 and narrow apical margins of 2-7 yellow; venter yellow with four piceous spots on each segment; hypopygium black margined with yellow; legs ferruginous, front and middle coxae yellow and blackish, hind coxae black, hind tibia and tarsus black, the tibia with a subbasal yellowish annulus; wings yellowish hyaline, venation blackish.

(1) New combination.

Male—Much smaller than female, with the sculpture much weaker and the body throughout more shining; antennae stouter and not quite so long, 31-jointed; mandible with a yellowish spot; palpi whitish; front and middle coxae and trochanters yellow.

Type-locality—Hoozan, Formosa.

Paratype—No. 43914, United States National Museum.

Three females and four males, the type and one other female from the type-locality, the rest from Taihorin. One female and two males are retained for the United States National Museum.

***Ephialtes taihokensis* (UCHIDA) (new combination)**

Pimpla taihokensis UCHIDA, *Insecta Matsumurana*, vol. 4, 1930, p. 126.

One female from Hoozan, 24 mm. long with antennae of like length and ovipositor sheath 6 mm. long, which, except for its larger size, agrees very well with UCHIDA's description.

Before the appearance of UCHIDA's paper I had assigned a name to this species and drawn up the following description, which I permit to go to press, since it includes numerous characters not mentioned by UCHIDA.

Female—Length 24 mm.; antennae 24 mm.; ovipositor sheath 6 mm.

Head very thin; temples very strongly reaching, little more than half as long as short diameter of eye, sparsely and weakly punctate; vertex impunctate; diameter of an ocellus a little shorter than postocellar and subequal to ocellular line; frons deeply concave, with a median groove that forks above to surround the anterior ocellus, posterior ocellus also partly surrounded by a groove; eyes nearly parallel within, shallowly emarginate opposite frons; face coarsely, sparsely punctate with a median longitudinal ridge and distinctly impressed on each side of middle; clypeus rather flat, only weakly separated into basal and apical portions, smooth and virtually impunctate; malar space two-thirds as long as basal width of mandible; maxillary palpi very long, extending far beyond apex of front coxae, basal two joints short and thick, apical three long and compressed; antennae 36-jointed, very slender, the basal joint of flagellum fully eight times as long as thick. Pronotum obsoletely partly striate, with distinct epomia; mesoscutum very finely punctate and densely, finely pubescent; scutellum sparsely punctate, flattened on top and with lateral margins sharply defined but not carinate; mesopleurum and sternum with coarse separated punctures running into striation in lower posterior and upper anterior angles, speculum impunctate; metapleurum finely, obliquely striate; propodeum with strong lateral ridges, coarsely, irregularly transversely rugose, the rugosity more confused on the sides, spiracles very large and elongate; nervulus postfurcal; nervellus broken

above upper fourth; legs very long, stout, the coxae conspicuously large. Abdomen densely, finely punctate basally, very finely coriaceous apically; first tergite without carinae, obsoletely bituberculate at summit, obliquely furrowed in apical angles; tergites 2-4 with oblique basal and nearly transverse apical furrows, a distinct lunule in the angle of their junction, fifth tergite also with distinct lunulae; ovipositor depressed especially toward apex, slightly decurved.

Black; scape, clypeus, an indefinite spot on each side of face, and base of mandibles ferruginous; flagellum fuscous; palpi testaceous; lower margin of pronotum and its humeral angle, subalar tubercle, scutellum, postscutellum, stains on lower part of mesopleurum and sternum and posteriorly on metapleurum, entire propodeum, basal four tergites and stains on the next three, and basal half of venter ferruginous to flavo-ferruginous; wings yellow hyaline, veins black, stigma and costa ferruginous, tegulae flavous; legs flavo-ferruginous, coxae paler, suture between femur and trochanter on hind and middle legs piceous.

Genus *Xanthopimpla* SAUSSURE

In an earlier paper (2) I discussed this genus as represented in the SAUTER collection. It is introduced here to indicate the position in the classification.

Of the sixteen species listed in my earlier paper, UCHIDA (3) has synonymized *grandis* CUSHMAN with *japonica* KRIEGER, with which he also synonymizes *formosensis* KRIEGER. With this synonymy I am not disposed to quarrel, since many of the characters employed by KRIEGER in his keys for the separation of species appear very trivial.

Echthromorpha notulatoria (FAB.)

This very widely distributed species is apparently rather abundant in Formosa, for it is represented in the SAUTER collection by 29 specimens from Taihorin, Kankau (Koshun), Kosempo, and Maruyama.

Genus *Theronia* HOLMGREN

Three species of this genus have been recorded from Formosa, *clathrata* KRIEGER and *zebroides* KRIEGER by UCHIDA and *rufescens* (MORLEY), under the name *zebroides* KRIEGER, by MORLEY. The last and two additional species are represented in the SAUTER collection. The following key will serve to distinguish the five species.

1. Areola of propodeum elongate, completely closed apically, costulae distinct *clathrata* KRIEGER

(2) Ent. Mitteil., XIV, p. 41-50, 1925.

(3) Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, 1928.

- Aleola no longer than broad, usually shorter, not completely closed apically, costulae entirely absent 2
2. First tergite more than twice as long as broad; lower tooth of mandible much longer than upper *zebroides* KRIEGER
First tergite much less than twice as long as broad; mandible teeth equal 3
3. Scutellum strongly elevated, precipitous both before and behind middle; ovipositor shorter than first tergite *brevicauda* n. sp.
Scutellum evenly convex; ovipositor about half as long as abdomen ... 4
4. Prepectal carina erased above; scutellar carina barely reaching middle; clypeus in male more or less distinctly transversely ridged across middle *rufescens* (MORLEY)
Prepectal carina complete; scutellar carinae extending well beyond middle; clypeus in male weakly, evenly, convex *formosana* n. sp.

***Theronia rufescens* (MORLEY)**

Orientotheronia rufescens MORLEY, Hym. Brit. India, vol. 3, pt. 1, 1913, p. 146.

Theronia zebroides MORLEY, Rev. Ichn. Brit. Mus., pt. 3, 1914, p. 44; UCHIDA, Journ. Fac. Agr. Hokkaido Imp. Univ., vol. 25, pt. 1, p. 40.

I return to MORLEY's name for this species in spite of the fact that MORLEY himself synonymized it with *zebroides* KRIEGER. KRIEGER definitely states that in his species the lower tooth of the mandible is twice as long as the upper tooth, and MORLEY as definitely described his species as having the teeth equal in length. Moreover, *zebroides* is described as having the first tergite more than twice as long as broad at apex; while in *rufescens* this segment is described as being merely "distinctly longer than broad." *Theronia zebroides* also appears to be more definitely black maculate than *rufescens*.

This species is represented in the SAUTER collection by nine females and five males.

The males vary greatly in size, convexity of temples, and development of the transverse ridge of the clypeus, the largest male having the temples most strongly convex and the clypeal ridge showing the maximum development. In the smallest male the clypeus has only a short ridge near each side, while in the largest male these ridges extend nearly to the middle and then bend abruptly toward the apex, ending in rounded knobs. The other three specimens exhibit various steps in the development of the ridges. Some of the females show faint traces of these ridges at the extreme lateral corners of the clypeus.

Theronia formosana n. sp.

Very similar in general to *rufescens* MORLEY, but easily distinguished from that species by the key characters.

Female—Length 9.5 mm.; antennae 8.5 mm.; ovipositor sheath 3.5 mm. These measurements are of a specimen of average size. The females vary from 7.5 to 11.5 mm. in length.

Temples sharply receding, weakly convex; diameter of an ocellus distinctly shorter than ocell-ocular line; eyes strongly convergent below, the face at bottom two-thirds as broad as vertex; face evenly convex, densely and coarsely punctate; clypeus weakly convex, truncate at apex, and with a narrow reflexed margin; mandibles short, stout, the teeth equal in length; antennae about 40-jointed, joints near apex much broader than long. Thorax polished, with sparse fine punctation on mesoscutum, mesopleurum, metapleurum, and in pleural and lateral areas of propodeum; notauli distinct, about one-third the length of the mesoscutum; scutellum shallowly convex, the carinae extending well toward apex; prepectal carina complete to anterior margin; propodeal carinae notably high and thin, areola a little broader than long, its sides diverging posteriorly, usually partly closed behind, spiracles elongate; apical abscissa of radius weakly sinuate; areolet small and broad, upper and lower sides parallel, the lower much shorter than the upper; nervulus slightly postfurcal; nervellus broken at or above upper fourth; legs stout, hind femur about three times as long as deep. Abdomen very minutely punctate; first tergite about one and one-half times as long as broad at apex, depressed, medially grooved, basal carinae not reaching spiracles; tergites 2-5 with low transverse elevations basally, obsolescent on 5; ovipositor very slender.

Head yellow, vertex reddish, stemmaticum with a yellow line curving around the inner side of each lateral ocellus, the small space behind front ocellus piceous; mandibles black at apex; antennae ferruginous, scape yellow below. Thorax yellow, mesoscutum ferruginous trifasciate, the middle fascia more or less piceous behind where it joins the prescutellar spot; the following markings piceous: a small vertical line in humeral angle of pronotum, lateral margins of mesoscutum, a stain on prepectus, the subalar groove, a triangular spot on posterior edge of mesopleurum connected by a narrow line with the subalar lines, and spots in the basal lateral and pleural areas of propodeum, sometimes confluent; legs pale ferruginous; coxae yellow, the hind coxa more or less piceous at base, front and middle femora and tibiae anteriorly and hind femur above at base and below at apex yellow, hind femur piceous at base, tarsi darker than tibiae; wings pale yellowish hyaline, veins black, stigma and costa testaceous. Abdo-

men yellowish stramineous, each tergite with a transverse piceo-ferruginous band, the latter sometimes absent on the apical tergites; sheath black.

Male—Essentially like female.

Type-locality—Kankau (Koshun), Formosa.

Paratypes—No. 43915, United States National Museum.

Twelve females and nine males, all but one from the type-locality, that from Taihorin. Six females and four male paratypes are retained for the United States National Museum.

Theronia brevicauda n. sp.

Female—Length 11.5 mm.; antennae 10.5 mm.; ovipositor sheath 1.3 mm.

Head nearly half as thick as broad; temples convexly receding; diameter of an ocellus a little shorter than ocell-ocular line; frons with a carina between antennae; eyes weakly convergent below, the face very nearly as broad as vertex; face moderately convex, coarsely and sparsely punctate, hardly two thirds as long as broad; clypeus medially shallowly impressed, apex truncate; upper tooth of mandible a little longer than lower tooth; malar space very short; antennae 41-jointed, stout, flagellum tapering at apex, somewhat compressed at base, subapical joints as long as thick. Thorax very stout, more than two-thirds as deep as long; mesoscutum polished and very minutely, sparsely punctate, notauli weak, not pitlike anteriorly; scutellum strongly elevated in middle, with steep, straight slopes, anteriorly and posteriorly, carinae very high and terminating abruptly at top of slope; mesopleurum virtually impunctate, prepectal carina erased above; metapleurum with strong rugae curving from lower anterior angle to middle of posterior margin and fewer to upper anterior angle; propodeum polished, carinae very high and thin, areola nearly twice as broad as long and partially closed posteriorly; apical abscissa of radius nearly straight; areolet long, the upper and lower sides convergent and nearly equal in length; nervulus weakly postfurcal; nervulus broken at about upper third; legs very stout, hind femur less than three times as long as deep. Abdomen broad; first tergite less than a half longer than broad at apex, depressed, with a shallow median groove, dorsal carinae reaching to spiracles; tergites 2-5 with transverse elevations, obsolete on 5; ovipositor thin and deep.

Head yellow, vertex suffused with ferruginous, pale piceous posteriorly, stemmaticum and teeth of mandibles black; antennae ferruginous, scape yellow below. Thorax yellow; mesoscutum trifasciate with piceo-ferruginous, the three fasciae confluent posteriorly with a prescutellar spot, lateral margins opposite tegulae piceous; a piceous line below subalar tubercles running downward along anterior margin and an oval spot in middle of posterior margin of mesopleurum

black; propodeum with a large black spot in each basal lateral area; legs largely yellow, front and middle femora dorsally and their tibiae suffused with ferruginous; hind coxa apically, apical joint of trochanter, and the femur below at base and apex black, femur dorsally piceo-ferruginous; hind tibia and all tarsi ferruginous; wings yellowish hyaline, veins black, stigma and costa testaceous. Abdomen ferruginous, with tergites 1-6 yellow apically, more broadly so at sides, and each with a transverse fascia of piceous, those of tergites 2-5 divided medially.

Type locality—Taihorin, Formosa.

One specimen.
