

Descriptions of New Chalcid-Flies from Hawaii and Mexico (Hymenoptera).

BY P. H. TIMBERLAKE.

(Presented at the meeting of December 6, 1923.)

The types of the Hawaiian species described in this paper are deposited in the collection of the Hawaiian Entomological Society, and those of the two Mexican species of Encyrtidae are in the collections of the Hawaiian Sugar Planters' Experiment Station.

ENCYRTIDAE.

Acerophagus debilis n. sp. Fig. 1.

This species is most like *notativentris* (Girault) among previously described species, and differs in the position and arrangement of the ocelli, in the much more clavate antennae, and by lacking a fuscous mark on the abdomen of the male.

Female. Head of the same general shape as in other North American

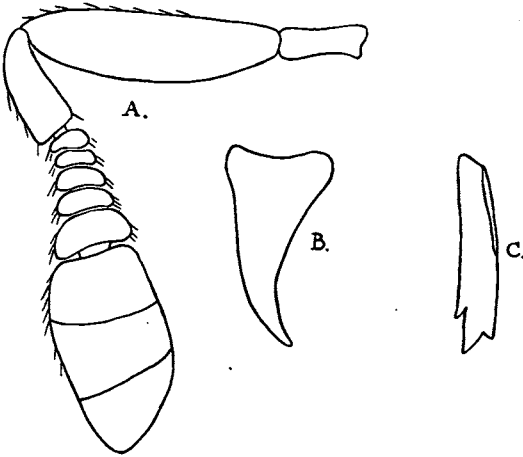


Fig. 1. *Acerophagus debilis*. A. Antenna of female. B and C. Mandible in dorsal and frontal views.

species of the genus, but rather thicker fronto-occipitally than in most species; in dorsal view fully rounded on the sides and in front; in side view thickest opposite the anterior ends of the eyes, the planes of the

frons and face meeting in slightly more than a right angle, the face somewhat shorter than the frontovertex; as seen from in front, distinctly wider than long, but not greatly so, the sides of the head rounded, the oral margin rather broad and subtruncate. Frontovertex about twice as long as wide, the orbits parallel; ocelli in a right-angled triangle, the anterior ocellus placed at the posterior third of the frontovertex, the posterior pair about their own diameter from the occipital margin and much closer to the eye margin; eyes rather smaller than in *notativentris*, somewhat less than twice as long as wide, widest near the anterior end; cheeks distinctly shorter than the width of the eyes; face with a rather shallow, semi-oval scrobal impression, the sides of the impression sloping; the bottom largely filled by the prominence between the antennae, which is about one-half longer than wide and reaches upward to the ocular line; the scrobes proper occupy the rather narrow space between the sides of the impression and the prominence, and converge and unite above in a curve. Antennae (Fig. 1a), inserted as usual close to the oral margin and far apart, more strongly clavate than in other species; scape rather wide, pedicel almost as long as the funicle and considerably narrower at apex than the scape; funicle joints all transverse and increasing in width, the fifth joint about twice as long and twice as wide as the first; club broadly oval, somewhat obliquely truncate at apex and as long as the funicle and two-thirds of the pedicel combined. Mandibles (Fig. 1b and c) of the usual type, with the outer tooth far basad, and the middle tooth considerably larger than the inner tooth.

Thorax and abdomen normal for the genus, the ovipositor sheaths protruded for a distance about equal to one-fourth of the length of the abdomen, or to the length of the middle tibial spur. Wings narrow, the disk finely, densely pubescent, but the setae in the basal area distinctly coarser and sparser; speculum narrow and only slightly widening as it approaches the posterior margin which it does not quite reach; stigmal vein narrow at base and gradually enlarging towards the apex, about twice as long as the marginal and postmarginal veins combined.

Sculpture throughout very finely alutaceous, the frontovertex not perceptibly more granular than the rest of the body; both it and the mesonotum with very minute, scattered setiferous punctures. Pubescence on the head very short and inconspicuous, the setae on the frontovertex nevertheless rather numerous and retrorse; eyes rather densely pubescent, the setae very short and erect; pubescence of mesonotum moderately thick and rather dark colored, quite uniform in distribution on the scutum, axillae, and scutellum.

Color of head, thorax, and abdomen about capucine yellow (Ridgway), the face and underparts of the thorax slightly paler with the scape, club and legs nearly unicolorous; remainder of antennae somewhat dusky; apex of ovipositor sheaths blackish; wings hyaline, the veins very pale brownish.

Length of body (0.436 to) 0.721; length of head, 0.235; width of head, 0.275; thickness of head fronto-occipitally, 0.151; width of frontovertex,

0.099; length of antenna, 0.339; width of mesoscutum, 0.240; length of fore-wing, 0.587; width of fore-wing, 0.226; length of exerted part of ovipositor, 0.073 mm.

Male. Similar to the female, but the frontovertex is proportionately wider, or not quite twice as long as wide, the anterior ocellus placed only a little behind the center; antennae slenderer, the club solid; the abdomen smaller, strongly depressed, ovate, and about two-thirds as long as the thorax.

Coloration paler, the vertex, notum of thorax and abdomen light orange-yellow (Ridgway), the frons shading into paler yellow anteriorly; the face, underparts of thorax and the legs pale yellowish; antennae pale yellowish, but with the fifth funicle joint and base of the club fuscous and the remainder of the club yellowish white.

Length of body (0.396 to) 0.533; length of head, 0.203; width of head, 0.214; thickness of head fronto-occipitally, 0.113; width of fronto-vertex, 0.085; length of antenna, 0.290; width of mesoscutum, 0.203; length of fore-wing, 0.521; width of fore-wing, 0.212 mm.

Described from 3 females (holotype and paratypes) reared from *Pseudococcus brevipes* Ckll. (*bromeliae* of authors) on pineapple, Amatlan, Vera Cruz, Mexico, May 20, 1922; 1 male (allotype) from the same host on *Tillandsia*, El Potrero, Vera Cruz, July, 1922; and 1 male (paratype) reared November 1, 1922, from the same host from Cuernavaca, Morelos, Mexico, all collected by H. T. Osborn.

Type No. 1142, Hawaiian Sugar Planters' Experiment Station.

Synaspidia new genus.

This genus appears to be closely allied to the *Blepyrus*, *Aenasius*, *Archinus*, and *Zaomma* group of genera. It differs from *Blepyrus*, *Euryrhopalus* and close allies in having the head non-menisciform and without large punctures; from *Archinus* it differs in having the post-marginal vein well developed and longer than the stigmal, the ovipositor not protruded, the cheeks not unusually short, etc. From *Zaomma* it differs in having the eyes smaller, the frontovertex only moderately narrowed, the facial impression not horseshoe-shaped, the club less strongly enlarged, the pedicel not very short, the antennae unicolorous, etc. On the whole, it seems to agree most closely with *Zaomma* which, unfortunately, is known to me only by description.* It agrees with *Zaomma* in having the face inflexed,

* I have since examined the type of *Zaomma argentipes*, which unfortunately has been badly mutilated, the head being in fragments on a slide. *Zaomma* has the thorax strongly convex above, the axillae rather well separated and slightly elevated above the scutellum; the latter is

with the frons prominent, the antennae strongly clavate, the marginal vein very short, the post-marginal and stigmal veins both long. The axillae and scutellum are closely fused in *Synaspidia* as in *Chalcaspis* and *Metaphaenodiscus*, but both of those genera have the head menisciform.

Female. Head much wider than long, thick fronto-occipitally with the face strongly inflexed and the frons prominent; in side view, appearing distinctly triangular, with the planes of the face and frontovertex about equal in length and meeting in a right angle; eyes large, very broadly oval, largely dorsal and latero-dorsal in position; frontovertex narrow or about four times as long as its narrowest part, the ocelli in an acute angle; face with a large scrobal impression which is subtriangular above; cheeks rather short or about one-half as long as the width of the eyes. Antennae inserted rather far apart close to the oral margin; scape slender, slightly widened at the middle, and reaching a little beyond the scrobal impression; pedicel of about normal length and shape, and rather longer than one-half of the funicle; flagellum short and strongly clavate, the funicle six-jointed and rapidly increasing in width distad, the first joint nearly twice as wide as long, the sixth about thrice as wide as long; club broadly oval, about one-half longer again than wide, rather longer and much wider than the funicle, three-jointed with the apical joint obliquely truncate beneath. Mandibles slender in frontal view, expanding at apex and with three acute teeth, of which the middle one is much the largest; base of mandible expanded in a plane at right angles with the apex. Palpi short, the maxillary pair four-jointed, the labial pair three-jointed.

General form of body short and robust, the thorax about one-third longer again than wide, pronotum largely concealed by the head, the collar not very strongly arcuate; mesoscutum nearly thrice as wide as long, its posterior margin slightly sinuate on each side of the middle; axillae but little wider than long, not especially acute at the inner angle and rather widely separated medially; they are also closely fused to the scutellum, the separating suture being only weakly indicated; the consolidated scutellum and axillae as a whole is about as long as wide at the base, and the apex is well rounded. Abdomen at base as wide as the thorax and somewhat shorter, subtriangular in dorsal view with the apex subtruncate; the dorsum rather deeply concave, the venter subvomeriform; vibrissal plates situated near the middle of the lateral margins; ovipositor wholly enclosed by the ventrites and the sheaths not appreciably protruded.

Legs short and normal in structure; middle tarsi with the usual tapering form and considerably stouter than the hind pair. Wings small and

pulvinate, longer than wide, the apex rather broadly rounded, the sides and apex high and declivous. The marginal vein is about three times longer than wide; the stigmal short, slender, curved upward, a little over one-half the marginal; the postmarginal shorter than the stigmal, being short and triangular.

not reaching much beyond the apex of abdomen; the disk moderately densely pubescent, the speculum very distinct, the basal area with sparser, somewhat coarser but more hyaline setae, the costal cell pubescent except next to the vein; marginal fringe very short but dense; submarginal vein reaching to the middle of the costal margin, almost straight and somewhat thickened near its apex; marginal vein quadrate-punctiform; the stigmal rather long, straight and with a slender, short spur at apex; post-marginal vein somewhat longer than the stigmal, the angle between these two veins acute; costal cell of hind wings moderately wide and extending to the hooklets.

Head and thorax with a very finely reticulate, moderately lustrous surface, the face more lustrous and with a considerably coarser reticulation; frontovertex with fine pin-punctures. Pubescence of head and body short, fine, appressed, dark-colored and inconspicuous; setae of the mesoscutum seriatly arranged, those on the axillae and scutellum sparser yet rather numerous. Coloration metallic.

Male. Very similar to the female, but the antennae are only eight-jointed, the funicle with five joints, and the club solid.

Type of the genus: *Synaspidia pretiosa* n. sp.

Synaspidia pretiosa n. sp. Figs. 2 and 3.

Female. Head with the whole dorsal surface sloping forward and downward nearly at right angles with the longitudinal axis of the thorax; as seen in frontodorsal view, it is strongly rounded on the sides, subtruncate in front, the occipital margin broadly roundly emarginate; as seen from in front, distinctly wider than long, strongly rounded on the sides, with the cheeks gibbously convergent towards the rather small mouth. Occiput rather deeply concave, its dorsal margin very acute; eyes large, hardly a third longer than wide, their outline strongly rounded except at the inner orbits, their posterior margin contiguous to the occiput; frontovertex narrowest at the anterior ocellus, slightly widening anteriorly and more abruptly widened at the posterior ocelli; ocellar triangle moderately acute, the distance between the posterior pair of ocelli equal to about three-fourths of the distance between either and the anterior ocellus; the posterior pair contiguous to the eyes and removed about one-half their own diameter from the occipital margin. Scrobal impression large and occupying nearly the whole face, but rather shallow, indefinitely bounded on the sides, but definitely limited above by the angle between frons and face; the prominence between the antennae low and weakly convex, oval in outline and about twice as long as wide; the scrobes proper in the form of linear grooves on each side of the prominence, but uniting above and forming the bottom of the whole impression in its dorsal half. Antennae and mandibles as in figure 2; maxillary palpi short, thickest at apex of the second joint, the first two joints nearly equal in length, the second about one-half longer than thick, the third distinctly smaller than

the second, although hardly shorter on its outer margin, the fourth joint cylindrical and tapering in apical half, about as long as the first two joints combined; labial palpi very short, the middle joint transverse, the apical joint somewhat the longest, conical, and hardly more than twice as long as thick.

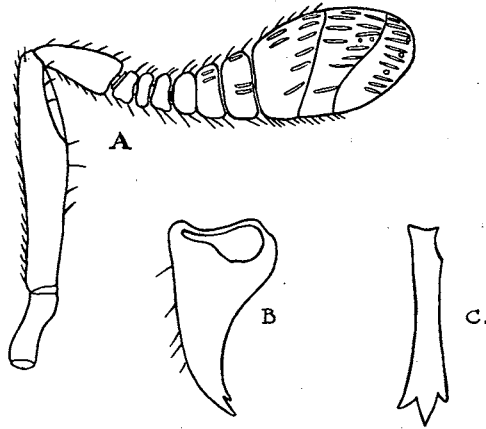


Fig. 2. *Synaspidia pretiosa*. A. Antenna of female. B and C. Mandible in dorsal and frontal views.

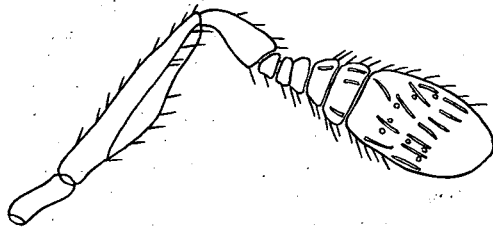


Fig. 3. *Synaspidia pretiosa*. Antenna of male.

Thorax moderately convex above, distinctly wider than the depth, dorso-ventrally; the axillae and scutellum very strongly depressed and lying in one plane, the apex of the scutellum very briefly elevated, yet abruptly declivous at the margin, the latter very finely acutely rimmed, just inside of which is a delicate submarginal furrow. Propodeum short and very transverse, considerably longer at the sides and there declivous, the basal margin finely carinate; on both sides of the middle this basal carina branches, the branch on each side curving backward and outward towards but not reaching the posterior margin halfway between the foramen of the petiole and the lateral corner; just inside of the spiracles on each side

another fine carina runs straight backward to the edge of the declivous portion of the propodeum, where it branches, the inner branch connecting with the submedian carina, the outer branch extending towards the posterior lateral corner of the propodeum, still another branch is given off anteriorly and runs forward to the spiracle; spiracles rather large, oval and contiguous to the basal margin of the propodeum.

Reticulation of head and thorax very fine and delicate, but somewhat coarser and more evident on the face; frontovertex with two longitudinal rows of pin-punctures on either side of the median line, and an orbital row of much finer punctures on each side; mesonotum with numerous seriatly arranged, minute setigerous punctures similar to the orbital punctures of the head, and becoming sparser on the axillae and scutellum; prepectal plates as coarsely reticulate as the face; mesopleura with an extremely fine reticulate shagreening; propodeum except for the carinae described above is mostly smooth; reticulation of the abdomen rather coarser and more evident than that of the face and with the lines mostly transverse, especially on the basal tergite.

Eyes with an extremely short sparse pubescence, not apparent except under high magnification; pubescence of head and body short, recumbent and dark-colored, antrorse on the frontovertex and retrorse as usual on the thorax, that of the axillae and scutellum becoming sparser and the apex of the scutellum with two considerably longer setae; sides of the propodeum behind the spiracles with a very fine whitish pubescence, which, however, is not conspicuous; pubescence along the sides and at the apex of abdomen sparse, but somewhat longer than that of the thorax.

General color moderately lustrous black; head with a rather weak bluish-green luster, the face more lustrous and greenish; mesoscutum usually somewhat bluish, but sometimes like the axillae and scutellum, which are darker and more aeneous; lateral posterior corners of the propodeum with a rather bright bluish luster; abdomen mostly like the scutellum, but the apical tergite has a brighter and greenish luster; antennae and legs concolorous with the body, but less lustrous, the tarsi mostly yellowish, with the last three joints of the hind pair, the last joint and the spines on the plantar surface of the middle pair fuscous, the front pair more or less dusky yellow, the spur of the middle tibiae yellow; wings hyaline, the disk with a very faint indefinite fuscous cloud beneath the stigmal vein, the veins brownish.

Length of body (1.16 to) 1.32; length of head, 0.497; width of head, 0.601; thickness of head fronto-occipitally, 0.325; width of vertex at anterior ocellus, 0.085; length of antenna, 0.662; width of mesoscutum, 0.561; length of fore-wing, 1.027; width of fore-wing, 0.502 mm.

Male. Very much like the female in most respects and the following differences appear to be the most important: Vertex widening a little more at and behind the posterior ocelli, somewhat protuberant and rather more dully shagreened; ocelli slightly larger and in a less acute triangle;

eyes considerably more densely and conspicuously pubescent; antennae (Fig. 3) with the flagellum proportionately shorter, the funicle only five-jointed, the club solid, but in general shape agreeing with the female; the scape with a narrow ventral exfoliation from the apex to a little more than three-fourths of the length excluding the radicle, this exfoliation in the female being much smaller and not reaching to the middle; abdomen somewhat wider than long, rounded at apex and hardly more than one-half as long as the thorax, therefore, considerably smaller, more depressed than in the female, and with the venter not at all vomeriform.

Length of body (0.825 to) 1.15; length of head, 0.441; width of head, 0.507; thickness of head fronto-occipitally, 0.261; width of vertex at anterior ocellus, 0.094; length of antenna, 0.542; width of mesoscutum, 0.499; length of fore-wing, 0.905; width of fore-wing, 0.457 mm.

Described from 13 females, 8 males, reared from *Pseudococcus brevipes* Ckll. (*bromeliae* of authors) collected in Mexico by Mr. Osborn, as follows: 1 female (holotype) reared August 10, 1922, from its host on *Tillandsia*, El Potrero, Vera Cruz; 12 females, 3 males (paratypes), reared from mealybugs on *Tillandsia* and other Bromeliaceous plants, El Potrero, on July 31, and during August, 1922; 2 males (allotype and paratype) with the same data, but collected in March, 1923; 3 males (paratypes) from mealybugs on a Bromeliaceous plant, Rio Seco, Vera Cruz, March 15, 1923.

Type No. 1143, Hawaiian Sugar Planters' Experiment Station.

Zeteticontus perkinsi n. sp. Fig. 4.

Female. Head moderately thick fronto-occipitally with the face slightly inflexed; in dorsal view appearing semi-circular with the occipital outline broadly and roundly emarginate; in side view appearing thickest fronto-occipitally at the anterior ends of the eyes, the planes of the face and frons meeting in an angle of distinctly more than 90 degrees; in frontal view appearing as wide as long and nearly circular in outline with the broad oral margin truncate. Occiput moderately deeply concave; eyes of medium size, broadly oval, about one-third longer again than wide, posteriorly contiguous with the occipital margin, the inner orbits somewhat diverging anteriorly; frontovertex occupying about a third of the total width of the head, and about one-third longer than its own width at the anterior ocellus; ocelli rather large, disposed in what is slightly more than a right-angled triangle, the posterior pair somewhat less than their own diameter from the occipital margin, and not more than one-half as far from the margin of the eyes. Cheeks in side view of head rather wider than long and distinctly shorter than the width of the eyes, the genal suture very obscure; facial impression subcircular, extending for about

one-half of its length above the ocular line, the prominence between antennae convex, about twice as long as wide and reaching somewhat above the middle of the facial impression; the scrobes proper broadly united above, the sloping walls of the facial impression extending far laterad of them (in *planiscutellum* the facial impression is distinctly triangular, rather shallow and strictly co-extensive with the scrobes proper, and the antennal prominence is about as wide as long); antennal sockets situated rather far apart near the oral margin, the distance between them somewhat less than the distance from either to the nearest part of the eyes, and slightly more than twice as great as the distance from either to the oral margin.

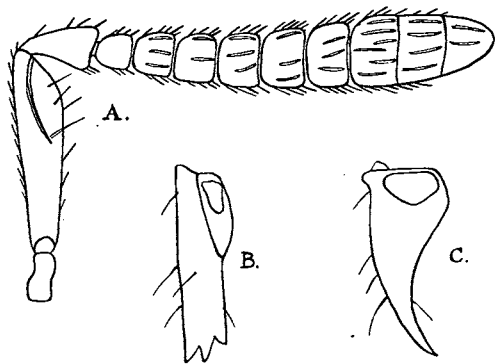


Fig. 4. *Zeteticontus perkinsi*. A. Antenna of female. B and C. Mandible in frontal and dorsal views.

Antennae moderately short and distinctly clavate (Fig. 4a); scape slightly expanded beneath and widest at about one-half way between the middle and apex; pedicel equal in length to the first two funicle joints combined, wider at apex than the following joint and slightly narrower than the second funicle joint; first funicle joint much the smallest, about as wide as long, the following joints increasing in width and slightly in length, the next two not much wider than long, the sixth about one-half wider again than long and nearly twice as wide as the first; club oval, a little tapering to the rounded apex, somewhat longer than the three preceding joints combined, its three joints nearly equal in length, the basal one broadest; flagellum except the first funicle joint provided with rather numerous but not at all crowded linear sensoria, the whole flagellum also with very numerous short reclinate setae, and similar, somewhat longer setae occur also on the scape and pedicel. Mandibles (Fig. 4b and c) and palpi as in other species of the genus; the two outer teeth of mandibles equal, both rather shorter than in *planiscutellum*, and the inner tooth placed considerably closer to the apex than in that species, the mandible, therefore, more similar to *abilis* as figured by Silvestri.

Thorax nearly twice as long as wide, moderately convex and not quite

so thick dorso-ventrally as wide; pronotum strongly arcuate; mesoscutum much longer medially than at the sides and somewhat less than twice as wide as long, its posterior margin nearly transverse or only slightly produced medially; axillae over twice as wide as long and very acute medially, their inner tips slightly separated or covered by the mesoscutum; scutellum nearly as long as the scutum, the greatest width about equal to the length, the width decreasing from near the base to the rounded apex, the sides low yet abruptly declivous, the disk moderately convex; propodeum extremely short in the middle, but strongly lengthening and becoming declivous towards the sides.

Abdomen a little shorter than the thorax, triangular in outline, with the basal angles rounded and strongly depressed with the dorsum a little sunken in; vibrissal plates situated on the lateral margin a little before the middle; ovipositor sheaths barely protruded, the spicula (in the unique type) lies free from the sheaths and curves downward and a little forward from the point where it issues a short distance from the apex of the venter.

Legs rather short, the middle tarsi considerably stouter than the hind tarsi, but not distinctly tapering towards apex, the basal joint about equal to the spur of the middle tibiae and about equal to the following three joints combined. Wings as in *abilis*, as figured by Silvestri except in the following particulars: Marginal vein fully twice as long as wide, the stigmal practically equal to the marginal in length and much more expanded at apex and constricted at base than in *abilis*, the post-marginal about one-half as long as the marginal; the row of about seven coarse setae guarding the proximal side of the speculum extends more than three-fourths of the distance towards the opposite margin; the second row of finer setae situated just proximad extends for the same distance as the first row and parallel with it, and there is another row of setae lying beneath and parallel with the submarginal vein; the discal pubescence beyond the speculum is moderately dense and fine, and the marginal fringe is extremely short, but dense.

Head with very fine reticulations transversely arranged between the anterior corners of the eyes and just above the facial impression arranged in lines conforming to the rounded margin of the impression, and in this manner extending downward and forward on the face towards the cheeks; the dorsal and anterior orbits of the eyes with a row of pin-punctures, which become gradually smaller and obscurer anteriorly; frontovertex provided also with two other curved rows of pin-punctures, beginning close to the orbital row on each side near the anterior part of the frons and curving backward to join together in a loop behind the anterior ocellus. Mesoscutum with equally fine scaly reticulations producing a somewhat rougher effect than on the head and with numerous seriatly arranged minute setiferous punctures; axillae appearing smoothish, yet with an extremely fine reticulation, the scutellum smooth and highly polished; propodeum smooth except for a small longitudinally shagreened median area, and provided with a distinct median carina, the posterior margin also carinate,

pleura distinctly reticulate throughout except on the metapleura; abdomen apparently smooth throughout.

Frontovertex with mostly antrorse short setae arising from the pin-punctures, the lower face and cheeks with similar finer setae; eyes with numerous but not dense short erect setae; posterior margin of pronotum with a row of setae about like those on the scutum; the seriatly arranged setae of the scutum rather coarser and longer than those on the fronto-vertex, the transverse row on posterior margin containing about fourteen, and the median longitudinal rows about six or seven setae; scutellum with about thirteen pairs of setae on the basal two-thirds, which strongly increase in size from the base towards the apex; the latter evidently provided with another pair of setae, which are broken off in the type, although their position is indicated by punctures; propodeum with a small tuft of fine short setae on the lateral margins; abdomen with fine setae along the sides and more numerous setae at apex.

General color aeneous black; the head, except most of the face, with a rather weak dark bluish-green luster, the pronotum and mesoscutum with a similar somewhat more greenish luster; facial impression, axillae, scutellum, and abdomen much more lustrous and with green, brassy, and dark purplish reflections; tegulae and underparts of thorax shining piceous with a metallic luster only on the pro- and metapleura. Scape dark brown, the pedicel and flagellum blackish. Legs shining piceous, with the tips of the front and middle femora somewhat paler or brownish; trochanters, apical third of front tibiae, middle tibiae except about basal third and the tarsi, except apical joint of hind pair and apex of last joint of the other pairs, brownish yellow. Wings entirely hyaline, the veins brownish yellow, with the marginal vein a little darker. Pubescence of body wholly dark colored.

Length of body, 1.36; length of head, 0.417; width of head, 0.443; thickness of head fronto-occipitally, 0.259; width of vertex at anterior ocellus, 0.160; length of antenna, 0.742; width of mesoscutum, 0.429; length of fore-wing, 1.183; width of fore-wing, 0.523 mm.

Described from one female (holotype), collected in Honolulu in 1906 by Dr. Perkins. The following note by Dr. Perkins is attached to the specimen: "*In horto meo*. Not previously seen by me." The species has not been taken since, and there is, therefore, some doubt that it has become established in the Islands.

APHELINIDAE.

Aphelinus maidis n. sp. Fig. 5.

Female. Head of the usual shape, wider than the thorax, as seen from above nearly three times as wide as thick fronto-occipitally, as seen from in front much wider than long; frontovertex only a little longer than wide

and somewhat narrowing forward; ocelli in an obtuse angle, the posterior pair about their own diameter from the occipital margin and somewhat more distant from the margins of the eyes; facial impression moderately deep, with sloping sides, the bottom occupied by the triangularly shaped, barely convex prominence, which reaches from the antennal sockets nearly to the dorsal end of the impression. Antennae (Fig. 5) inserted moderately far apart close to the oral margin; scape about four times or a little more as long as wide; pedicel about one and two-thirds times longer than the first two funicle joints combined; the latter equal, and about one-half wider than long; third funicle joint over twice as large as the preceding joint, somewhat wider than long and about one-fourth as long as the club; club narrowly oval, as long as the pedicel and funicle combined and two and one-third times longer than its own width. Mandibles with an acute outer tooth and a broad inner truncation, the ventral or outer edge provided also with a strong tooth-like spine or lobe halfway between the base and apex. Maxillary palpi two-jointed, the basal joint hardly longer than thick, the apical joint about thrice as long; labial palpi two-jointed, both joints about twice as long as thick, the apical joint a little shorter and slenderer. Thorax and abdomen practically as in related species, such as *mali*, *nigritus*, etc. Wings fully developed and with seven oblique rows of coarser setae proximad of the speculum, the basal fourth of the disk bare.

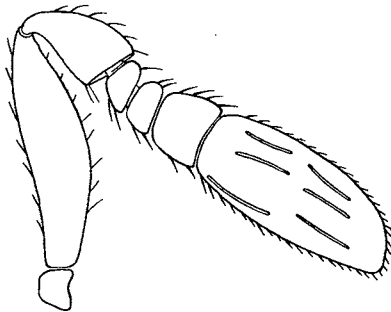


Fig. 5. *Aphelinus maidis*. Antenna of female.

Head very finely, delicately shagreened with reticulations and moderately shiny, the frontovertex with numerous fine shallow setiferous pinpunctures; thorax and abdomen moderately shiny, or about as in *nigritus*, and rather less shiny than in *mali*; the thorax with extremely fine uniform reticulations, the abdomen apparently smooth. In the pubescence of the head and body there appears to be not much difference between this and related species, but the vertex has two pairs of setae, which are considerably coarser than the other setae of the frontovertex; one of these four setae is placed behind each one of the posterior ocelli, and each of the

other pair is placed at the posterior corner of the vertex close to the occipital margin.

General color black, but the head and abdomen may be more or less fuscous brown, the base of abdomen more or less distinctly yellowish, although in many cabinet specimens appearing wholly dark. Mandibles pale brown; antennae dusky yellow; legs pale yellow, the front femora on dorsal side and front tibiae except at apex slightly brownish; middle coxae at base, hind coxae, middle and hind tibiae fuscous to blackish, the apical half of the middle femora more dilutely fuscous; tarsi, especially beneath, more brownish-yellow than the other paler parts of the legs, and the apex of the apical joint fuscous. Wings hyaline, but faintly tinged with fuscous, especially beneath the marginal and stigmal veins; the veins yellowish.

Length of body (0.554 to 0.990), 0.903; length of head, 0.276; width of head, 0.386; thickness of head fronto-occipitally, 0.191; width of vertex at posterior ocelli, 0.151; length of antenna, 0.363; width of mesoscutum, 0.358; length of fore-wing, 0.858; width of fore-wing, 0.396 mm.

Male. Very similar to the female and distinguished with difficulty in case of dry specimens, but averaging considerably smaller in size and with the wings often a little clearer.

Length of body, 0.533 to 0.811 mm.

Described from the following material: 32 females, 22 males (holotype, allotype male, and paratypes), reared from *Aphis maidis* Fitch, in Honolulu, December, 1919, to February, 1920 (Timberlake); 1 female (paratype) reared from *Aphis maidis* on grass, Ewa Plantation, Oahu, May 19, 1922 (Timberlake); 2 females, 1 male (paratypes), from same host on corn, Manoa Valley, Oahu, April 10-11, 1923 (Timberlake); 2 females, 2 males (paratypes), collected on sugar-cane, Mountain View, Hawaii, January 21, 1918 (Timberlake); 8 females, 6 males (paratypes), reared from *Aphis sacchari* Zehntner on sugar-cane, Honolulu, August 18-25, and September 13, 1916 (Timberlake); 1 male (paratype) from the same host on sugar-cane, Ewa Plantation, Oahu, August 3, 1918 (Timberlake); 1 female (paratype) collected in Honolulu, March 21, 1917 (Timberlake); 1 male (paratype) reared from *Aphis sacchari*, Hawaii Mill Co., Hilo, Hawaii, September 16, 1913 (Swezey); 1 female (paratype) collected at Waieka, Hawaii, October 2, 1913 (Swezey); 1 female (paratype) collected at Waialua, Oahu, January 8, 1923 (Swezey); 1 male (paratype) reared from *Aphis* sp. on *Scirpus maritimus* L., Honolulu, January 7, 1913

(Swezey) and 2 males (paratypes) collected in Honolulu in 1906 (Dr. Perkins).

Aphelinus maidis comes closest to *A. nigritus* and *lapisligni* Howard, and is distinguished by the characters given in the following table. In Kurdumoff's table of the European species it runs to *varipes* (Förster) and to *hordei* Kurdumoff, but does not agree with either, as both the middle and hind tibiae are black.

***Aphelinus gossypii* n. sp. Fig. 6.**

Female. Head shaped exactly as in *maidis* as far as can be determined in more or less shriveled specimens; antennae (Fig. 6) inserted in the usual position; the scape not quite four times longer than wide, excluding the radicle joint; pedicel almost twice as long as the first two funicle joints combined; first funicle joint about twice as long as ~~long as~~ ^{wide} the second distinctly longer than the first and about one-third wider than

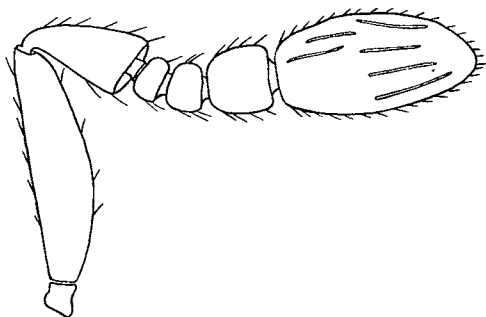


Fig. 6. *Aphelinus gossypii*. Antenna of female.

long, the third about as long as the first two combined, only slightly wider than long and a little less than one-third as long as the club; club rather broadly oval, one-half as wide as long, as long as the funicle and two-thirds of the pedicel combined, and provided with about six slender linear sensoria. Mandibles nearly as in *maidis*; maxillary palpi also the same, the labial pair with one joint about five times as long as thick; the terminal joint of both palpi in this species and also in *maidis* bears a slender, long, spine-like appendage, which may be a true but much attenuated segment, but which is regarded as a seta in the preceding computation of the joints. Thorax and abdomen practically as in *maidis*; wings fully developed, the speculum limited basad by a single row of coarser setae and by about two to five additional setae in the angle between this row and the marginal vein.

Sculpture about the same as in *maidis*, except that the setiferous punctures of the frontovertex are less numerous and less distinct; the pubescence the same, but sparser on the frons.

Color of the head and body shiny black, the base of the abdomen more or less distinctly yellow, the extreme tip of the abdomen and the ovipositor sheaths also yellowish. Mandibles pale brown; scape, and sometimes the pedicel, pale brown or dilutely fuscous, the rest of antenna dusky yellow. Legs, including coxae, blackish; apex of front femora, front tibiae except for a more or less distinct infuscation on the basal half, front tarsi, middle trochanters, apex of middle tibiae with spur and tarsi and hind tarsi except basal joint brownish yellow; hind trochanters and hind femora clear pale yellow. Wings almost hyaline, the veins yellowish.

Length of body (0.598 to) 0.914; length of head, 0.351; width of head, 0.443; thickness of head fronto-occipitally, 0.165; width of vertex at posterior ocelli, 0.174*; length of antenna, 0.434; width of mesoscutum, 0.396; length of fore-wing, 0.903; width of fore-wing, 0.405 mm.

Male.—Very similar to the female, but smaller and with the antennae slenderer, the club being hardly wider than the funicle and more pointed at apex than in the female.

Length of body (0.452 to), 0.747; length of head, 0.295; width of head, 0.358; thickness of head fronto-occipitally, 0.160; width of vertex at posterior ocelli, 0.153; length of antenna, 0.403; width of mesoscutum, 0.302; length of fore-wing, 0.754; width of fore-wing, 0.349 mm.

Described from 25 females, 9 males (holotype and paratypes) reared from *Aphis gossypii* Glover collected in Honolulu in May, 1919, and in March, 1923; also 1 female (paratype) associated with this *Aphis* on Hibiscus in Honolulu, April 12, 1918 (Timberlake); 1 male (allotype), labelled "on bean *Aphis*," presumably *Aphis medicaginis* Koch, collected in Honolulu, November 22, 1904 (Swezey); and 1 male (paratype) collected at Kilauea, Hawaii, in July, 1906 (Dr. Perkins).

This species of *Aphelinus* is very similar to *A. mali* (Halde-
man), but is readily distinguished by the characters given in the following table of species.

***Aphelinus semiflavus* Howard.**

Three females reared February 29, 1916, from *Toxoptera aurantii* (Fonscolombe) collected on the Manoa Cliff trail on Tantalus, Oahu, and one female reared March 30, 1918, from

* Head somewhat shriveled, so that the measurements are necessarily more or less inaccurate.

Aulacorthum circumflexum (Buckton), also from Tantalus, agree very well with North American specimens from Clemson College, South Carolina and Los Angeles, California. The wings of these specimens are clearer hyaline than in the North American specimens, the scape and pedicel are paler and in the female from *A. circumflexum* the wings are small and narrow, but agree in this respect with all males that I have seen from the United States, and also with one female from Los Angeles. In both of these females with small wings the abdomen is considerably blackened except at the base.

TABLE OF CERTAIN SPECIES OF APHELINUS MOSTLY
HAWAIIAN AND NORTH AMERICAN

The following table has been prepared to show the relationship of the two species described in the preceding pages, and to aid in the identification of these and other species. One Australian species is also included.

1. Body partly black or brown, or wholly dark..... 2
 Body wholly yellow except ocelli and eyes; wings with four basal rows of setae and a fifth row widely separated from the others; legs and antennae yellow.....*automatus* Girault
2. Speculum of fore-wing bounded basad by several rows of setae..... 5
 Speculum bounded basad by one and one-half rows of setae or by one row and several more or less scattered setae just beneath the marginal vein..... 3
3. Abdomen yellowish on basal segment; scape narrower..... 4
 Abdomen wholly black or fuscous; legs brownish, the hind femora pale yellow, hind tarsi whitish, with the basal joint brown; scape short and rather wide, about one-third as wide as long, hardly longer and a little wider than the club.....*niger* Girault
4. Frontoververtex smooth and with very minute and inconspicuous punctures; scape blackish, about four times longer than wide, but hardly narrower than the club; pedicel about one-third longer than the third funicle joint; funicle and club clear yellow, the third funicle joint slightly longer than wide; hind tarsi not black at the base; ovipositor sheaths dusky except at apex..*mali* (Haldeman)
 Frontoververtex with more evident pin-punctures beset with longer bristles than in *mali*; scape pale fuscous, about four times longer than wide, but considerably narrower than the club; pedicel nearly twice as long as the third funicle joint; funicle dusky, the club purer yellow, the third funicle joint slightly wider than long; hind tarsi yellowish with the basal joint and apex of the

last joint dark brown or blackish; ovipositor apparently shorter and more tenuous than in *mali*, the sheaths shorter and wholly yellow *gossypii* n. sp.

5. Wings large and comparatively wide, the disk beyond the speculum finely and densely pubescent, the marginal fringe comparatively short and often inconspicuous 6
 Wings comparatively small and narrow, the stigmal vein reaching far beyond the middle of the costal margin, the disk beyond the speculum with coarser, sparser setae, the marginal fringe, comparatively long and conspicuous; abdomen except the lateral margins usually wholly yellow; the male with elongate antenna, the third funicle joint not much shorter than the long, slender club *semiflavus* Howard
6. Head wholly black 7
 Face yellow, but the frontovertex brown or blackish.....
 *abdominalis* (Dalman) and allies
7. Front and middle legs not wholly clear yellow 8
 Legs wholly clear yellow, except the hind coxae and tibiae; abdomen not yellow at base; scape not over three times as long as wide; wings clear, hyaline..... *nigritus* Howard
8. Middle and hind coxae and tibiae brown or blackish, the hind femora clear yellow, remainder of legs yellowish although the front femora and tibiae may be more or less dusky; abdomen sometimes but not usually distinctly yellowish at the base in dry specimens; antennae much as in *nigritus* but the scape is about four times longer than wide; wings with a faint cloudiness on the disk mostly beyond the speculum *maidis* n. sp.
 Legs brown or blackish including the hind femora, but the tips of the tibiae, the tarsi, and all of the front tibiae more or less distinctly yellow; antennae about as in *maidis*; wings with a faint but distinct smoky cloud on the disk, deepest below the marginal vein *lapishigni* Howard

Aphytis Howard.

In 1908, Dr. Howard suggested that it would be desirable to segregate the aphid-feeding species of *Aphelinus* into a new genus, but he never carried out his suggestion for the reason, I believe, that he was not entirely sure of the characters of the type species of the genus. Since that time Kurdumoff has given a synopsis of the European species of *Aphelinus*, and has shown clearly that the genotype, *A. abdominalis* (Dalman) is an aphid-feeding species. It is, nevertheless, still desirable to divide *Aphelinus*, but now it is apparent that coccid-feeding species

are the ones to be segregated. Two generic names are available for this group of species: *Prosaphelinus* De Gregorio, 1915, about which there is no doubt, and *Aphytis* Howard, 1900, which by the original description was said to differ from *Aphelinus* in having one less funicle joint. Mercet has already pointed out that *Aphytis chilensis* Howard in all probability is closely allied to his *Aphelinus longiclavae*, and therefore similar also to *A. capitis* Rust. I believe it is safe to conclude that *Aphytis chilensis* really has three funicle joints, with the first one very small and overlooked by Dr. Howard, and I therefore adopt this name for the group of the old genus *Aphelinus* containing the coccid-feeding species.*

The two genera *Aphelinus* and *Aphytis* as here recognized have much in common but most of the species differ considerably in habitus. *Aphelinus*, at least typically, has a broad head and the body tapering behind it to the apex of the abdomen, but the essential generic difference lies in the ovipositor. This in *Aphelinus* is comparatively tenuous and is enclosed entirely by the ventrites so that in oviposition it is protruded backward in a more or less horizontal position. In *Aphytis* the head, thorax and abdomen do not differ greatly in width, and the ovipositor is comparatively strong and entirely free, so that in oviposition it descends almost perpendicularly from near the base of the abdomen.

Two Hawaiian species belong to *Aphytis* as here recognized, viz: *Aphytis diaspidis* (Howard) and *A. limonus* (Rust).

TRICHOGRAMMATIDAE.

Megaphragma new genus.

Female. Head apparently very thin fronto-occipitally, the fronto-vertex somewhat wider than one-third of the whole head, the eyes large, the cheeks rather short, the sides of the head and the cheeks gibbously convergent on the mouth. Ocelli apparently absent. Antennae (Fig. 7a) inserted very high on the face between the eyes, apparently rather nearer

* Subsequent examination of the type of *Aphytis chilensis* in the National Museum does not lead me to change the above statement. Only two funicle joints are actually visible in the unique type, but the antennae are so folded beneath the head that an unobstructed view of the base of the funicle can not be obtained.

to the occipital margin than to the mouth, and six jointed; scape sub-fusiform-compressed, but not very wide, including the radicle about as long as the eyes; pedicel large and pyriform, contracted at apex, much thicker than the scape or the following two joints; funicle composed of one minute ring-joint which is twice as wide as long; club as long as the rest of the antenna, three-jointed, strongly fusiform in shape, the basal joint about twice as long as wide at the base but increasing in width toward the apex; middle joint about twice as long and thrice as wide as the preceding joint and widest just beyond the middle; apical joint very strongly conical, nearly as long as the preceding joint, and provided with conspicuous longitudinal chitinous ridges running the whole length and some of them strongly projecting at apex. Mandibles with two strong acute teeth at apex. Maxillary palpi apparently one-jointed but rather elongate and tapering; labial palpi not seen.

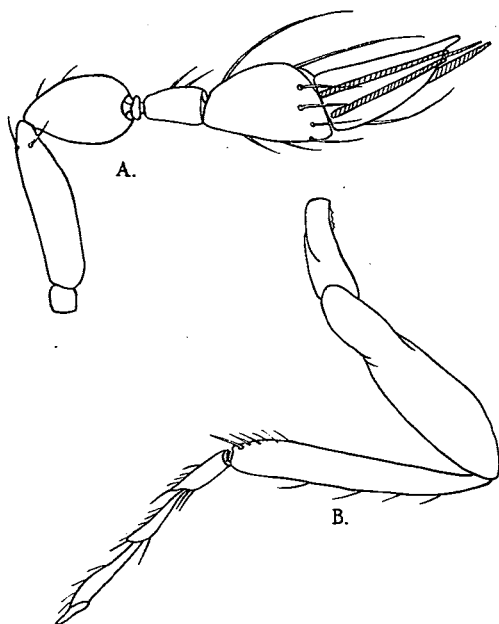


Fig. 7. *Megaphragma mymaripenne*. A. Antenna of female. B. Hind leg of female.

Thorax scarcely as long as wide; pronotum not visible from above; the parapsidal furrows strongly developed, the middle lobe of the mesoscutum about as long as wide; scutellum about twice as wide as long, and very broadly rounded at apex. Abdomen broadly sessile, very slightly narrower than the thorax and slightly longer, the apex rather

narrowly rounded; phragma of the mesothorax has but slightly converging sides and it reaches almost to the apex of the abdomen; ovipositor not protruded, and internally it reaches almost to the base of the abdomen; thorax and abdomen together form an oval mass nearly twice as long as wide.

Legs (Fig. 7b) of moderate length, the femora rather stout but compressed, the front tibiae also considerably enlarged; middle and hind tibiae and all the tarsi cylindrical and slender, the tarsi rather long although only three-jointed.

Wings resembling a typical Mymarid wing in shape, being linear, about seven times longer than wide, and having an exceedingly long marginal fringe; venation reaching about to the middle of the costal margin, the submarginal and marginal veins about equal in length, the stigmal vein short and stubby, the postmarginal vein absent; costal cell extremely narrow; disk of wing on the apical half with a row of few fine, short setae; hind wing extremely narrow, yet rounded at apex.

Male. Not known.

Type of the genus: *Megaphragma mymaripenne* n. sp.

Megaphragma differs from all other Trichogrammatidae known to me except *Hydrophylax* Matheson and Crosby in having the wings linear and very long-fringed. *Hydrophylax*, however, has the thorax and abdomen combined about four times as long as wide, the legs considerably longer and slenderer, the antennae eight-jointed with two well-developed funicle joints besides an annellus, and with a comparatively small three-jointed club. In Girault's classification *Megaphragma* falls in the tribe *Lathromerini* but differs from all the included genera with six-jointed antennae in having the wings very narrow and long-fringed.

***Megaphragma mymaripenne* n. sp. Fig. 7.**

Antennae as in Fig. 7a, the middle joint of the club with two large setae and several smaller ones, the apical joint with one moderately long seta and with at least two of the chitinous sensoria projecting at apex.

Disk of wing with about five or six very minute setae in an irregular median longitudinal row on the apical half beyond the venation; disk narrowest opposite the apical part of the marginal vein, somewhat widening proximad and about twice as wide on apical half as at the narrowest point, the apex well rounded. Marginal vein with two fine, rather short setae at its base, and on the disk near the opposite margin just proximad of the constricted part is a somewhat longer seta. Marginal fringe

beginning on the posterior margin opposite the stigmal vein and consisting of about twenty-six setae, the first one opposite the stigmal vein being a little smaller than the discal seta just preceding it which is mentioned above; the following setae rapidly increasing in length, those at and on both sides of the apex about one-half as long as the wing itself, those on the anterior margin gradually and slightly decreasing in length basad and abruptly terminating at a point slightly more than midway between the apex of the wing and the stigmal vein; the remainder of the costal margin to the stigmal vein provided with a fringe of exceedingly minute short setae about five in number and visible only under high magnification.

Hind wing exceedingly narrow but triangularly widened at the hooklets, and slightly widened again at the apex which is rounded; no discal setae present; marginal fringe composed of twelve setae beginning on the posterior margin just beyond the hooklets and abruptly terminating on the anterior margin at the apex of the wing, only two of the setae being situated on the anterior side of the apex; the setae also rapidly increase in length towards the apex, where they are only slightly shorter than those of the fore-wing.

Tarsi of front legs distinctly longer than the front tibiae; tarsi of middle and hind legs (Fig. 7b) slightly shorter than the corresponding tibiae.

No definite surface sculpture observable under high magnification.

Head and thorax rather pale yellow, the eyes black; antennae and legs pale yellowish; occiput of head and the abdomen brown; wings hyaline, but the hind pair are rather distinctly infuscated at and near the hooklets.

Length of body, 0.252; length of antenna, 0.162; length of fore-wing, 0.229; greatest width of fore-wing, 0.031; greatest length of marginal fringe of fore-wing, 0.135; width of thorax, 0.118; length of thorax and abdomen combined, 0.195 mm.

Described from two females (holotype and paratype) mounted on a slide with fragments of about three other females which were accidentally crushed during preparation. These specimens were collected by Mr. C. E. Pemberton late in January, 1920, on the leaves of a forest tree at Mountain View, Hawaii, where they were associated with Thysanoptera. Mr. Pemberton had a suspicion at the time that the *Megaphragma* were parasitic on the thrips. This species is presumably an immigrant in the Hawaiian Islands, but of this there is, of course, no direct proof at present.

***Aphelinoidea xenos* n. sp. Fig. 8.**

Female. Structurally similar to *A. semifuscipennis* Girault, but the basal joint of the club shows no transverse groove or suture on the ventral

side near the middle, the apical margin of the joint is more nearly straight on both sides, or only gently arcuate, whereas it is deeply angularly emarginate on the outer surface in *semifuscipennis*; the fore-wing narrower with fewer or about twenty discal hair lines at widest part of the disk, *semifuscipennis* having about twenty-five to twenty-eight lines, the disk, therefore, distinctly more sparsely pubescent; the marginal fringe distinctly longer and practically equal to one-fifth of the greatest width of the disk, but in *semifuscipennis* equal to about one-seventh of the width of the disk.

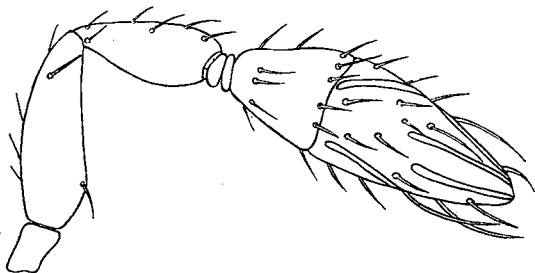


Fig. 8. *Aphelinoidea xenos*. Antenna of female.

General color much paler than in *semifuscipennis* or yellowish brown instead of piceous. Dry specimens are brown, with most of the head, the dorsum of the thorax and sometimes apex of the abdomen above paler and more or less yellowish, and with the lower half of the occiput, the cheeks, lower part of the face, the sternum, pleura, and most of the abdomen fuscous brown. In balsam mounts the coloration is dusky yellow, with the lower half of the occiput, the cheeks, oral margin of face, sternum, pleura, and transverse bands on the abdomen appearing rather dilutely fuscous, these darker parts being not very conspicuous nor sharply bounded except on the occiput, the bands on the abdomen sometimes confined to the basal half or two-thirds; rest of the face, apex, and part of the venter of abdomen purer brighter yellow, the frontovertex orange yellow; eyes and ocelli bright carmine; antennae clear yellow; legs dusky with the tips of the tibiae and the tarsi paler and more yellowish.

Wings hyaline, but with basal part beneath the venation clouded with fuscous, the apical margin of the cloud extending slightly obliquely distad from the apex of the stigmal vein towards the opposite margin and into the pubescent area of the disk; the cloud also with a darker triangular area beneath the apex of the marginal vein, the apex of the triangle touching the vein; just proximad is a slightly clearer area, somewhat similar in shape, but smaller and with the base of the triangle against the vein, sometimes this clearer area is more diffused and extends along the vein towards the base of the wing; hind-wings with a short slightly clouded

area beneath the apical half of the venation; marginal vein of both fore and hind-wings distinctly more infuscated than the rest of the venation.

The following measurements are given in a column parallel with similar measurements of *semifuscipennis*:

	<i>xenos</i>	<i>semifuscipennis</i>
Length of body to apex of ovipositor (0.471 to) ..	0.635 mm.	0.537 mm.
Length of antenna	0.234 mm.	0.224 mm.
Length of scape	0.081 mm.	0.079 mm.
Length of pedicel	0.049 mm.	0.045 mm.
Length of club	0.103 mm.	0.098 mm.
Length of basal club joint	0.037 mm.	0.035 mm.
Length of pedicel and flagellum	0.153 mm.	0.145 mm.
Length of fore-wing	0.475 mm.	0.499 mm.
Width of fore-wing	0.191 mm.	0.215 mm.
Length of marginal fringe of fore-wing	0.040 mm.	0.037 mm.

Male. Very similar to the female, but with the antennae slenderer, the two joints of the club practically equal in length, the wings narrower, with the discal pubescence somewhat sparser and the marginal fringe distinctly longer or nearly one-third as long as the greatest width of the disk.

Coloration as in the female, except that the fuscous bands on the abdomen are confined entirely to the basal half or a little more than half of abdomen, the fuscous cloud at base of wings somewhat paler.

Length of body, (0.417 to) 0.608; length of antenna, 0.222; length of scape, including radicle, 0.083; length of pedicel, 0.048; length of club, 0.081; length of basal joint of club, 0.041; length of pedicel and flagellum combined, 0.138; length of fore-wing, 0.478; greatest width of fore-wing, 0.163; length of marginal fringe of fore-wing, 0.051 mm.

Described from 21 females, 20 males (holotype, allotype, male and paratypes) mounted on slides and reared by Mr. Swezey from the eggs of *Sogata paludum* (Kirkaldy) collected at Kewalo in Honolulu on August 18, 1913, and on May 4, 1914; and 14 specimens (paratypes) of undetermined sex, mounted on cards and reared with the preceding specimens.