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NEW GENERA AND SPECIES OF ENCYRTINAE FROM CALIFORNIA PARASITIC IN MEALYBUGS (HYMENOPTERA)

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The material which forms the basis of this paper has been assembled during the last three or four years, mainly through the efforts of Mr. C. P. Clausen while engaged in a study of *Pseudococcus* and related genera in California. In all, three new genera and six new species are described, the types of which will be deposited ultimately in the United States National Museum. Notes on two foreign or introduced species under *Tanaomastix* are included to complete the generic conception.

Tribe MIRINI

*Acerophagus*¹ Emily Smith

Of the three species included in the material two are new and all belong to the *A. texanus* group, the five species of which now known may be separated as follows:

FEMALES

1. Wings without a conspicuous cross band2
Wings with a smoky band across the disk*A. fasciipennis*, n. sp.
2. Frontoververtex about one-third to three-fourths longer than wide3
Frontoververtex about twice as long as wide, the ocelli in an angle of about 85°*A. notativentris* (Girault)

¹ For a recent revision of this genus see Proc. U. S. Nat. Mus., vol. 50, pp. 574-79. The antennal club of *A. texanus* (Howard), represented as solid in figure 52, plate 31 (*loc. cit.*), in reality is composed of three closely fused joints except in the male.

3. Ocelli small, the posterior pair their own diameter from eye-margin, coloration pale4
 Ocelli large, the posterior pair close to eye-margin, coloration vivid orange yellow *A. texanus* (Howard)
4. Frontoververtex about three-fourths longer than wide, the ocelli in a right angle, coloration chrome lemon yellow *A. pallidus*, n. sp.
 Frontoververtex wider, about one-half longer than wide, the ocelli in slightly more than a right angle, coloration pale cadmium yellow *A. gutierreziae* Timberlake

MALES

1. Wings hyaline throughout2
 Wings with a smoky band across the disk *A. fasciipennis*, n. sp.
2. Coloration pale yellow, the abdomen usually more vivid than thorax3
 Coloration orange yellow, the abdomen concolorous
 *A. texanus* (Howard)
3. Abdomen without a dark blotch behind the vibrissae4
 Abdomen with a conspicuous blackish brown blotch behind the vibrissae
 *A. notativentris* (Girault)
4. Thorax and abdomen pale cadmium yellow..... *A. gutierreziae* Timberlake
 Thorax gamboge yellow, the abdomen more orange yellow especially at apex and with two dusky transverse bands across the middle
 *A. pallidus*, n. sp.

Acerophagus fasciipennis, n. sp.

FEMALE

Frontoververtex about one-half longer than wide; the ocelli in a right-angled triangle, the median one situated considerably nearer the occipital margin than in *A. gutierreziae*, or very noticeably behind the center of the frontoververtex, the posterior pair less than their own diameter from the eye-margin and about twice as far removed from the occipital margin; eyes not pubescent; antennae practically as in the other species of the group, except that the scape and club are proportionately considerably shorter (see table of measurements below); wings nearly uniformly ciliated, the speculum² extremely narrow above or practically obliterated, abruptly widening below and connecting with a branch of the hairless streak on the posterior margin; ovipositor slightly longer than in *A. gutierreziae*, or about two-fifths the length of abdomen, its sheaths pubescent. Length, exclusive of ovipositor, 0.75 mm.

Coloration a little paler than in *A. gutierreziae* or more of a clay yellow, the underparts still paler, but the abdomen decidedly brighter or more orange yellow; appendages concolorous with

² The term adopted here is one used by Thomson for the oblique hairless streak.

underparts, the antennae except club, however, a little deeper yellow than legs; the ovipositor black at apex; wings with a conspicuous tegumentary smoky band across the disk, its distal margin opposite the end of the stigmal vein and slightly convex, the basal fourth of wing with a brown dot on lower margin at the very base; hind wings also slightly smoky across the middle.

MALE

Frontovertex about one-third longer than wide, the anterior ocellus at the center; otherwise structurally about as in female. The coloration slightly paler, more of a chrome lemon yellow, the abdomen orange yellow, and the wings banded as in the female. Length, 0.8 mm.

Described from one female, one male (type and allotype) reared from early larval stages of *Pseudococcus crawii* (Coquillett), Uplands, California, November, 1914 (C. P. Clausen), Clausen no. 53.

***Acerophagus notativentris* (Girault)**

Fig. 1

Pseudaphycus notativentris Girault, *Descrip. Hym. Chalcid. variorum cum Observ.*, vol. 3, p. 10, Glendale, Md., May, 1917.

FEMALE

Frontovertex nearly twice as long as wide, finely granulose about as in *A. texanus* and minutely punctulate; ocelli forming an angle of about 85° , the anterior one a little behind the center

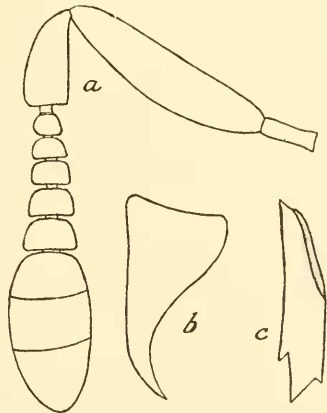


Fig. 1. *Acerophagus notativentris*: A, antenna of female; B, right mandible of female, exterior-dorsal view; C, same, anterior view.

of the frontovertex, the posterior pair about their own diameter from the occipital margin and less than half as far from the eye-margin; face considerably shorter than length of eyes, the scrobes as in the other species; eyes with a rather thick, but fine, short pubescence; funicle joints of antennae (fig. 1, A) proportionately a little wider for their length than in other species; dorsal tooth of mandible (fig. 1, B and C) much smaller and more basal than usually; wings uniformly ciliated, the speculum narrow, not interrupted and reaching nearly to the posterior margin; ovipositor protruded about one-fourth the length of abdomen, its sheaths pubescent. Length, 0.5-0.8 mm., exclusive of ovipositor.

Coloration about cadmium yellow, the face, cheeks, and underparts a little paler; a transverse spot on concealed part of pronotum blackish; the metanotum, but not propodeum, slightly brownish; a spot on sides of abdomen before the vibrissal plates, the vibrissal plates and the margin of the segments in the center of the dorsum of abdomen brown; antennae dusky yellowish, the scape somewhat purer yellow, the club more whitish; coxae and femora yellowish white, the tibiae and tarsi more yellowish with apex of last tarsal joint dusky; exerted portion of ovipositor dusky; wings hyaline, the veins pale yellowish; pubescence of head and thorax dusky.

MALE

Similar to the female in all characters; the frontovertex a trifle wider, the ocelli more nearly in a right angle; the abdomen a little shorter than thorax instead of as long. Coloration somewhat brighter or more of a chrome lemon yellow, the face and underparts more vivid, and the dorsum of abdomen behind the vibrissal plates blackish brown except the sides. Length, 0.42-0.6 mm.

Redescribed from thirteen females, nine males, reared October, 1914, and during the summer of 1915, from a *Pseudococcus* species on grape, Fresno, California (H. S. Smith), California State Insectary no. 675, also compared with Girault's types.

Acerophagus pallidus, n. sp.

Fig. 2

FEMALE

Frontovertex about three-fourths longer than wide, about as closely granulose as in *A. texanus* or almost punctulate; ocelli in a right-angled triangle, the anterior one noticeably behind the

center of the frontovertex, the posterior pair nearly their own diameter from eye-margin and twice as far removed from occipital margin; face a little shorter than length of eyes, the head being a little thinner anteroposteriorly than in *texanus* or *gutierreziae*, the serobes about the same; eyes with a very fine, short, sparse pubescence; antennae (fig. 2, A) about as in other species of the *texanus* group, the pedicel, however, proportionately longer and slenderer, or a little longer than the first four funicle joints combined; mandibles (fig. 2, B and C) normal; wings uniformly ciliated, the speculum somewhat wider below and nearly connecting with the hairless streak on the posterior margin; ovipositor about one-third the length of abdomen, its sheaths pubescent. Length, 0.9 mm., exclusive of ovipositor.

Coloration almost uniformly pale yellow, about chrome lemon, the appendages coneolourous, with apex of ovipositor black; wings hyaline, the veins pale yellowish; pubescence on head and body about as abundant as in the other species of the group, but not conspicuous except on face, where it is whitish or silvery.

MALE

Similar to the female, but the following differences may be noted: Frontovertex slightly wider or about one-half longer than wide, the ocelli in a slightly acute or almost equilateral triangle. Coloration the same, except that the dorsum of the abdomen at apex is orange yellow, separated from the paler base by a narrow, transversely areuate dusky band between the vibrissae. Length, 0.7 mm.

Described from two females, two males (type, allotype and paratypes *a* and *b*) reared from *Pseudococcus yerbasantae* Essig, May 12, 1915, Sespe Cañon, California (C. P. Clausen), Clausen no. 67.

TABLE OF FEMALE ANTENNAL MEASUREMENTS (LENGTH × WIDTH) OF ACEROPHAGUS IN MICRONS

	Scape excluding radicle	Pedicel	Funicle 1	Funicle 2	Funicle 3	Funicle 4	Funicle 5	Club
<i>A. faseiipennis</i>	141×30	60×20	15×16	12×19	12×20	16×23	20×28	105×38
<i>A. pallidus</i>	180×36	82×25	18×18	18×20	18×20	18×25	24×30	129×54
<i>A. gutierreziae</i>	154×23	59×25	12×15	12×18	15×20
<i>A. notativentris</i>	157×38	67×30	12×20	12×23	15×28	20×33	23×38	136×61
<i>A. texanus</i>	159×36	64×28	15×23	18×25	20×28	20×31	20×38	136×59

Stemmatosteres,³ n. gen.

FEMALE

Head very thin anteroposteriorly, a little wider than thorax, the greater portion of frontovertex and face lying in one plane, which is very slightly convex; seen from in front, the outline is rounded, the occipital margin appearing truncate, the length and width about equal; in lateral view (fig. 3, B) the outline is narrowly and irregularly oval, the greatest thickness just below the eyes; in dorsal view (with head held vertically) only the vertex visible, sloping gently backward to the occipital margin, which is abruptly rounded, not sharp, its outline now appearing concave; occiput with a rather shallow, semicircular excavation on the dorsal half into which the prothorax fits, the neck being

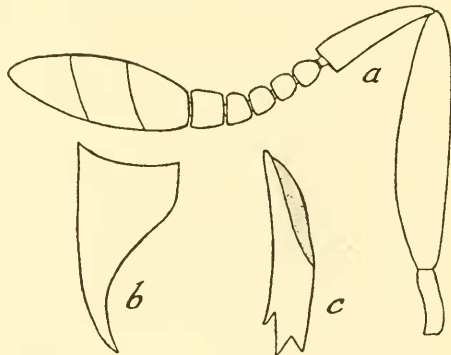


Fig. 2. *Acrophagus pallidus*: A, antenna of female; B, right mandible of male, exterio-dorsal view; C, same, anterior view.

inserted near the dorsal margin of the excavation, so that the head may be held either vertically or horizontally, the former position apparently being the normal or resting position in life; frontovertex considerably wider than long, the ocelli absent, the eyes small, oval, coarsely faceted; face abruptly rounded off to the oral margin from just above the antennal sockets, the scrobes entirely absent; cheeks a little longer than length of the eyes; antennae (fig. 3, C) inserted rather far apart and close to the

³ From *στεμματοστερής*, deprived of stemmata, in reference to the lack of ocelli.

oral margin, a little less than half as long as body, distinctly clavate; the scape slender, compressed; pedicel as long as the first three funicle joints; the funicle five-jointed, all joints short, increasingly transverse, the fifth nearly twice as wide as long; club large, oval, not much wider than the last funicle joint and as long as funicle and pedicel combined, composed of two joints, the basal one being much shorter; mandibles (fig. 3, E) with three long, acute teeth, the ventral one far more basal, the upper two at the apex, with the middle one slightly longer. Thorax small, the visible portion of dorsum hardly more than one-half as long as abdomen; pronotum very large, fully as long as the mesoscutum and scutellum combined; mesoscutum very short and transverse, about four times wider than long; scutellum also short and transverse, a little longer than the scutum, the axillae coalesced with it, the sutures not at all visible unless insect is mounted in balsam; metathorax and propodeum concealed by the base of the abdomen, which overlaps the posterior part of the thorax so that the apex of the first abdominal segment and the posterior margin of the mesopleura lie in the same vertical plane; wings either absent or vestigial, the front pair visible in some specimens as minute, linear scales, no longer than the scutellum, bearing two bristles at apex and one on the side, hind pair of wings apparently entirely absent; legs short, normal, the middle tibial spur slender, tapering, a little shorter than the first tarsal joint, hind tibiae with two spurs, the smaller one half as long as the other. Abdomen large, oval, depressed, the first segment shortest, the second longest; ovipositor shortly protruded, otherwise enclosed by the fifth sternite, which reaches to the apex of the abdomen but does not become at all compressed; vibrissal plates situated at the apical fourth, the vibrissae reaching about to the apex. Surface of head and body nearly smooth, or very finely alutaceous, the frontovertex with extremely minute, shallow, scattered setiferous punctures; pubescence short, very delicate, pale colored, and hardly visible except under high magnification; coloration yellow, non-metallic, but with a pearly luster.

MALE

Much like the female, except that the abdomen is considerably shorter and wider, the antennal scape (fig. 3, D) a little wider and the club considerably longer and solid.

TYPE OF GENUS

Stemmatosteres apterus, n. sp.

This genus is anomalous in the absence of ocelli, in the structure of the antennal club, the reduction and peculiar configuration of the thoracic sclerites and the overlapping of the abdomen upon the posterior part of the thorax. The wings are probably never fully developed on account of the reduction of the mesonotum. The genus appears to be most closely allied to *Accrophagus* Smith.

Stemmatosteres apterus, n. sp.

Fig. 3

FEMALE

Head and body chrome lemon yellow, the dorsal surface of the head with a pearly luster (in life) which reappears to a less degree on other parts of the body; antennae dusky yellowish, purer yellow at the base of the scape; legs concolorous with body, dusky only at tip of the last joint of the tarsi; a linear mark on each side of pronotum at the neck, and the exerted portion of the ovipositor sheaths blackish; the vibrissal plates brown.

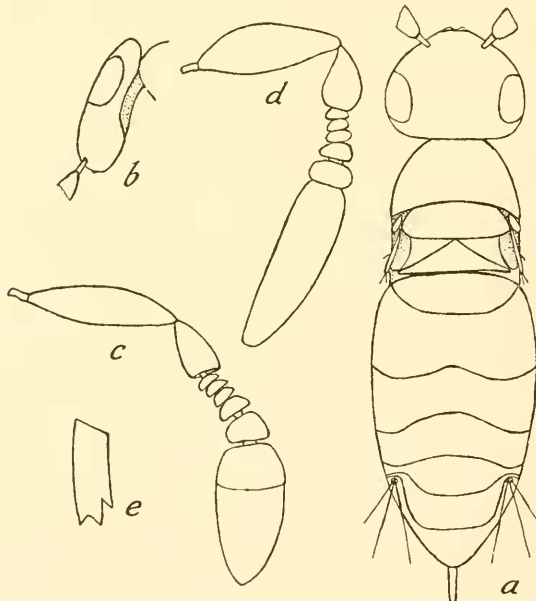


Fig. 3. *Stemmatosteres apterus*: A, female, dorsal view; B, lateral view of head, female; C, antenna of female; D, antenna of male; E, right mandible of female, ventral view.

Length, 0.5–0.6 mm. with head held vertically, 0.6–0.7 mm. with head extended horizontally, exclusive of ovipositor.

MALE

Colored like the female, except that the yellow is decidedly more of a chrome orange tint especially on the abdomen. Length, 0.4–0.46 mm. with the head vertical, 0.49–0.55 mm. with head horizontal.

Described from eight females, two males (type, allotype and paratypes *a* to *h*) reared from *Pseudococcus timberlakei* Cockerell, November 1–3, 1915, Millbrae (in salt marsh), California (P. H. Timberlake), Salt Lake Laboratory no. 1830 A.

***Pseudococcobius* Timberlake**

This genus recently characterized (Proc. U. S. Nat. Mus., vol. 50, p. 563, May, 1916) appears on further study of the genotype and the additional species described below much more closely allied to *Aphycus* than was at first supposed, and the discovery of a few more species might well bridge the relatively slight gap between the two groups. The species belonging here are probably all parasitic in mealybugs, and the differences separating them from *Aphycus* appear to be an adaptation to their soft-bodied hosts. The abdominal character used in my recent paper on *Aphycus* to separate the two groups proves to be unreliable, as I have discovered since that the fifth sternite often reaches to the apex of the abdomen even in *Aphycus*, although there is no marked tendency towards compression of the abdomen as seen in *Pseudococcobius*. The mandibles, however, so far as they have been studied carefully, always have acute teeth in *Pseudococcobius* and blunt teeth in *Aphycus*, but otherwise do not differ much. The antennal club of *P. terryi* is not actually solid, as stated in my paper, but composed of three closely fused joints, as a study of fresh material proves, although it seems nearly if not quite impossible to distinguish them under ordinary circumstances.

Aphycus oracac Howard belongs in the *Pseudococcobius* group, as a re-examination of the type discloses the fact that the mandibular teeth are acute. This species is similar to *P. fumipennis*, described below, in type of coloration but is quite distinct.

Pseudococcobius chrhorni is not congeneric with *terryi*, as the mandibles are distinctly bidentate and considerably more narrowed toward the apex. The antennae also are considerably

different. It is one of the apparently rather numerous forms that make a gradual transition between the more typical members of the Ectromatini and Mirini. The accession of fresh material of *chrhorni* permits a better understanding of its structural peculiarities, and it is consequently elevated to generic rank.

***Pseudococcobius fumipennis*, n. sp.**

Fig. 4

FEMALE

Head as seen from in front hardly wider than long, not so thick anteroposteriorly as in *P. terryi*; frontovertex about one-half longer than wide; ocelli in an equilateral triangle, the posterior pair about one-fourth their own diameter from the eye-margin, the median one at the center of the frontovertex; eyes large, not pubescent, in outline nearly circular except for the dorsal orbits being parallel; cheeks moderately long, or about four-fifths as long as the diameter of the eyes; antennal scrobes moderately deep, meeting above in an acute angle; mandibles (fig. 4, B and C) with the teeth acute and nearly equal. An-

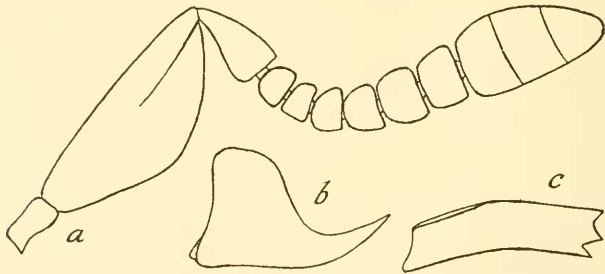


Fig. 4. *Pseudococcobius fumipennis*: A, antenna of female; B, right mandible of male, exterio-dorsal view; C, same, anterior view.

tenal scape (fig. 4, A) flattened and expanded below, nearly one-half as wide as long; pedicel about as long as the first three funicle joints combined; the funicle increasing gradually in width so that the sixth joint is a trifle more than one-half wider than the first, the first three, and especially the second, shorter than the last three joints, all increasingly wider than long; elub large, oval, rounded at apex, a little longer than the last three funicle joints combined, and after collapsing one-third as wide again as the last funicle joint. Wings thickly ciliated, the cilia

a little weaker at apex; speculum narrow, reaching two-thirds of the distance to the posterior border of wings and well separated from a cut-off portion which is equally distant from the posterior wing-margin; bristles on the submarginal vein a little more developed than in *terryi*, but still weak. Length, 0.9-1.2 mm.

Lower part of face and cheeks, almost the entire upperparts of the body, and the venter of abdomen dull black, the latter with a small white spot on each side near margin at the base; frontovertex very pale ochraceous brown, narrowly margined on all four sides and narrowly striped down the middle or at least in the ocellar region with brownish black; upper portion of face and cheeks creamy white to flesh tinted, the pale area on face divided into two transverse bands by a blackish band of about the same width which stretches between the lower corners of the eyes; on the cheeks the pale area barely touches the lower corners of the eyes and is separated from the eye-margin posteriorly by a triangular blackish area continued forward as a narrow line and cutting across the lower corners of the eyes to unite with the black facial band; occiput pale ochraceous brown; collar of pronotum narrowly whitish with a blackish dot on each corner; tegulae pale brownish at the center and on the posterior margin, whitish on the anterior and lateral margins; underparts of thorax dull brownish black with the anterior corners of the mesopleura, and the prepectal plates whitish. Antennae brownish black, with an oval spot on dorsal, apical corner of scape, and the apical half of pedicel, with the last two funicle joints white, the club slightly paler at apex. Legs dull brownish black variegated with white as follows: apical portion of all coxae, the trochanters, the dorsal margin of front femora with apex and a small spot on ventral margin near apex; base and apex of middle and hind femora and a narrow band near apex of each, on the middle pair connecting on lower margin with the apical area; base of all tibiae and two narrow cross bands on each, less distinct on front pair; all the tarsi except last joint on front and middle pair and last two joints on hind pair, and the tibial spur white. Fore wings conspicuously smoky, due to integumentary pigmentation, gradually becoming clearer toward the apex and the base, with a small clear spot at the apex of the submarginal vein and a more deeply stained area at the juncture of the marginal and stigmal veins; hind wings hyaline.

MALE

Entirely similar to the female in structural and colorational characters, except that the last two funicle joints are brownish instead of white. Length, 1.2 mm.

Described from two females and two males (type, allotype, and paratypes *a* and *b*) reared from *Pseudococcus solani* (Coekereell), Uplands, California, June, 1914 (C. P. Clausen), Clausen no. 23.

***Pseudococcobius clauseni*, n. sp.**

Fig. 5

MALE

Head rather thin anteroposteriorly, as seen from in front about one-fifth wider than long; frontovertex about twice as long as wide, the dorsal orbits of eyes parallel; ocelli in an acute-angled triangle, the posterior pair about one-half their own diameter from the eye-margin, and twice their own diameter from the occipital margin; eyes large, about one-fifth longer

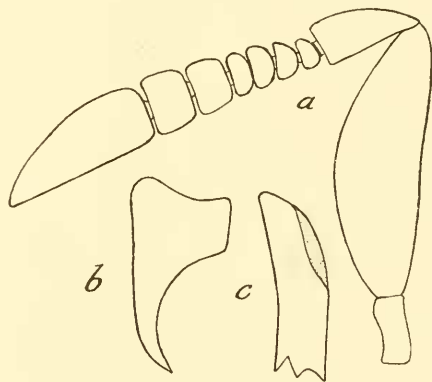


Fig. 5. *Pseudococcobius clauseni*: A, antenna of male; B, right mandible of male, exterior-dorsal view; C, same, anterior view.

than wide, thinly pubescent with short pile; cheeks as long as the width of the eyes; face with a moderately developed prominence between the antennae, the scrobes rather shallow, narrow and meeting above; mandibles (fig. 5, B and C) rather wide at apex with three sharp, nearly equal teeth, which are longer than in *P. fumipennis*. Antennal scape (fig. 5, A) flattened, moderately expanded below, about one-third as wide as

long; pedicel a little longer than the first four funicle joints combined; funicle increasing in width distad so that the sixth joint is over one-half wider than the first; the first four joints short, the first two a trifle longer than the third and fourth, each except the first about twice as wide as long, the last two joints nearly twice as long as the preceding, yet still wider than long; club solid, no wider than the funicle, a little longer than the preceding five joints combined, and obliquely rounded at the apex dorsoventrad; first five funicle joints with comparatively long and coarse pile, the sixth joint and club with a much thicker, finer and shorter pubescence. Wings with a narrow, curved cross band of weaker, paler cilia at the end of the stigmal vein; speculum very narrow but uniform, not quite reaching the stigmal vein nor more than two-thirds of the distance to the posterior margin; bristles on submarginal vein well developed. Abdomen about two-thirds as long as the thorax, triangular in outline, depressed, the base cordate. Length, 0.8 mm.

The frontovertex and upperpart of face to lower margin of eyes pale clay yellow, more cadmium yellow next to the orbits and dusky or brownish on vertex behind the ocelli; occiput, cheeks and lower part of face blackish brown, a paler brown, transverse spot above antenna; thorax and abdomen dull black with a slight brownish tint; the pleura more brownish, with most of the propleura, the prepectal plates and the anterior margin of the mesopleura dusky whitish; collar of pronotum whitish with a brown dot on each corner; tegulae blackish brown with anterior and exterior margin whitish. Antenna black, with the sixth funicle joint and the club white. Anterior legs pale brownish with most of the trochanter, the basal, inner, ventral margin and band close to the apex of the femora, the base and apex of tibiae and the tarsi yellowish white, the first and last two tarsal joints, however, dusky; middle trochanters and femora dusky white with a brownish streak on the under side of the latter, the tibiae whitish with base and apex narrowly blackish and with two brownish black annuli near their middle, the tarsi and tibial spur dusky yellowish, the last tarsal joint darker; hind legs similar to the front pair except that the tibiae have an additional, narrow white annulus at their middle, and the femora have their upper, inner margin whitish. Basal half of wings deeply smoky to the end of the stigmal view, with the apical margin of the area convex, and separated by a rather narrow, curved pale band from the slightly dusky apex of the

disk, the basal area being integumentarily stained although strengthened by the dense, dark colored ciliation, the apical dusky area, however, entirely ciliary in origin. Pubescence of head and body whitish and conspicuous on the dark parts.

Described from one male reared from an *Erium* species on cactus, Riverside, California, October, 1914 (C. P. Clausen), Clausen no. 10.

Cirrhencyrtus,⁴ n. gen.

FEMALE

Head moderately thick anteroposteriorly, the dorsal surface convex, passing over into face by a rather abrupt curve, the frontovertex moderately wide, the ocelli in a right-angled triangle, the posterior pair close to the eye-margin and much farther removed from the occipital border; seen from in front, the head is about as wide as long, the cheeks a little longer than width of eyes and converging toward the broadly truncated oral margin; seen from the side, the head is subtriangular in outline; occiput uniformly but not deeply concave, the neck inserted at the center;

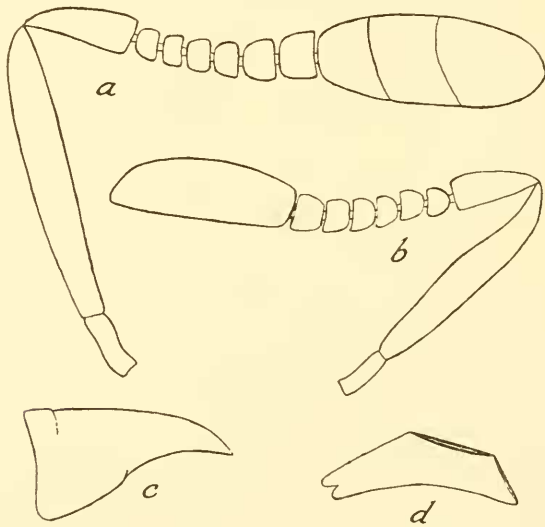


Fig. 6. *Cirrhencyrtus chrhorni*: A, antenna of female; B, antenna of male; C, left mandible of female, exterior-dorsal view; D, same, anterior view.

⁴From *Kip'pós*, tawny yellow, and *Encyrtus*.

eyes moderate in size, oval, one-third longer than wide, slightly pubescent; mandibles (fig. 6, C and D) narrowed toward apex with two nearly equal, blunt or rounded teeth, of which the dorsal is more apical; antennal scape (fig. 6, A) cylindrical, moderately long, reaching considerably beyond plane of front, pedicel as long as the first four funicle joints; funicle six-jointed, increasing slightly in width distad, all joints short, transverse; club large, oval, somewhat longer than the funicle, in life hardly wider than funicle, but after death collapsing so that it is much wider, its sutures plainly visible, the last joint longest with a rounded area of softer tissue at its apex. Thorax of normal structure, the pronotum arched, the mesoseutum transverse, the axillae meeting medially, the scutellum flat, triangular with apex slightly rounded, its sides abruptly declivous; wings large, uniformly ciliated, with oblique hairless streak or speculum; marginal vein punctiform, stigmal moderately long, its apex triangularly enlarged, postmarginal nearly as long as the stigmal, but rapidly tapering and becoming transparent, bristles on submarginal vein reduced; costal cell of hind wing narrowed distad but extending to the hooklets; legs longer and slenderer than normally, especially the middle pair, the middle tibial spur moderately long and slender, shorter than the first tarsal joint. Abdomen rather subquadrate in shape, its sides nearly parallel, the apex subtruncate; excluding the ovipositor, which is slender and prominently protruded, its length is about equal to two-thirds of the thorax; the venter not at all compressed, the fifth sternite reaching to the apex. Sculpture alutaceous, the frontovertex more coarsely so; vestiture moderately abundant, dark colored on the thorax; coloration flavous, the collar of pronotum, tegulae and appendages concolorous.

MALE

Very similar to the female, but the frontovertex is wider, the ocelli larger, the antennae (fig. 6, B) a little shorter with slightly longer, thicker pubescence, the club solid and slenderer, the postmarginal vein considerably shorter, and the abdomen more ovate.

TYPE OF GENUS

Pseudococcobius ehrhorni Timberlake**Cirrhencyrtus ehrhorni** (Timberlake)

Pseudococcobius ehrhorni Timberlake, Proc. U. S. Nat. Mus., vol. 50, p. 564, 1916.

Fig. 6

The male hitherto unknown differs from the female as follows: Frontovertex about one-fourth longer than wide; antennae a little smaller, more pubescent, the club obliquely acuminate on the upper side. Coloration the same, except that the black dots on venter at apex are absent, the metapostnotum and the abdomen above at center blackish brown, and the antennae pale brownish with base of scape alone yellowish. Length, 1.1 mm.

One male and female reared from *Pseudococcus ryani* (Coquillett) Berkeley, California, August 20, 1914 (C. P. Clausen), Clausen no. 21.

Tribe ECTROMATINI

Tanaomastix,⁵ n. gen.

FEMALE

Head as wide as thorax, submenisciform, thin anteroposteriorly, the face to a slight degree inflexed; seen from in front, subcircular in outline with cheeks converging toward mouth at nearly a right angle, about as wide as long; seen from the side, in outline subtriangular, the facial side longer than the dorsal side, the latter being convexly rounded; occiput concave, the neck inserted near the center, the occipito-vertical margin acute; frontovertex rather broad, as wide as long, the ocelli in a right angle, the posterior pair farther removed from eye-margin than from the occipital margin; eyes large, broadly oval, a little wider on lower half, the dorsal orbits nearly parallel, posteriorly reaching to the occipital border; face reaching considerably upward between the eyes, a little longer than wide, the scrobes distinct but not deep, converging above but not meeting, separated by a very slightly arched ridge, which is hardly visible in side view of head; cheeks short and narrow, hardly longer than one-half the width of the eyes; mandibles normal for tribe, long and narrow with two acute teeth; antennae (fig. 7, B) inserted close

⁵ From *ταναός*, tapering, long, and *ἡ μάστιξ*, whip, in reference to the antennae.

to a line drawn between the lower corners of the eyes, about equidistantly from each other as from eyes and clypeal margin, in form long and slender as in *Leptomastix* (Förster) Mayr, the scape flattened but hardly expanded, the pedicel about equal to the first funicle joint, the funicle filiform: all the joints much longer than thick, not increasing in width distad, the club after collapsing a little thicker than the funicle and a little longer than the last two joints combined. Thorax short and thick, the dorsum but slightly convex; pronotum short, arcuate; mesoscutum about twice as wide as the median length; axillae lying in same plane with scutellum, meeting or nearly meeting medially; scutellum flat, abruptly declivous at the sides, the apex rounded; metanotum and propodeum both short, almost divided medially, the side pieces triangular, the propodeum also very abruptly

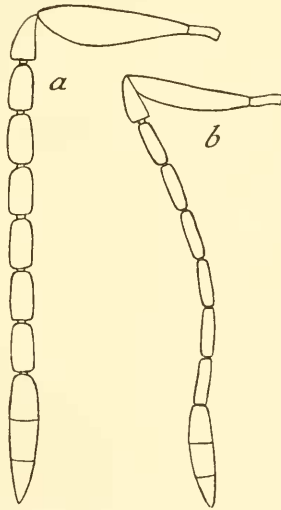


Fig. 7. *Tanaomastix*: A, female antenna of *T. claripennis*; B, same of *T. abnormis*.

deflexed and overlapped by the abdomen; legs long and slender, the middle tibiae noticeably longer than their femora, the spur a little shorter than the first tarsal joint, which is almost as long as the following four combined, hind tibia with one small apical spur; wings narrow, elongate, the costal cell very narrow, marginal cilia short, marginal vein about three times as long as thick, the stigmal slightly longer, straight and enlarged at apex, the post-marginal considerably longer than the stigmal; hind wings

linear, the costal cell extremely narrow or evanescent, the vein but slightly bent. Abdomen as seen from above acutely triangular in outline; the dorsum deeply concave, the venter strongly compressed; the ovipositor entirely enclosed within the fifth sternite which reaches to the apex; the vibrissal plates situated at the base and withdrawn within the dorsal concavity.

Sculpture entirely alutaceous, the frontovertex much more coarsely so or closely granulose, pubescence on head scanty and very fine, on mesonotum more evident and arising from microscopic punctures. Coloration non-metallic.

MALE

Not differing noticeably from the female except in the structure of the antennae, which are somewhat longer, the scape about the same, the pedicel much shorter than the first funicle joint or hardly longer than thick, the funicle joints all elongate, slender, incised at each end above except at base of first joint, each clothed with rather long erect hairs arranged in three whorls, the apical whorl somewhat incomplete on lower side, club solid, no thicker than the funicle, and about one-half longer than the preceding joint; the abdomen also does not become sunken in, and the dorsum is more coarsely sculptured than in the female.

TYPE OF GENUS

Paraleptomastix abnormis Girault

The two other species so far known show but little deviation from the above description based entirely on *P. abnormis*, the chief differences residing in the shape of the head, and the length of the middle tibial spur in comparison with the first tarsal joint as brought out in the following descriptions and notes.

The genus is most closely related to *Leptomastix* (Förster) Mayr, which differs in having the head menisciform, the face not at all inflexed, the scrobes meeting above and separated by a strongly arched ridge prominently visible in side view of head; the antennae inserted higher up or between lower corners of eyes; the pedicel not over one-half as long as the first funicle joint; the funicle clothed with stiff bristle-like hairs in the female, and with longer hair in the male arranged in three whorls on basal three joints and in two whorls on apical three; the club in male with a fringe of short bristles on lower margin of basal half; thorax more convex; wings wider and the postmarginal

variable, in *P. histrio* and *P. dactylopii* not longer than stigmal, but in an undescribed species considerably longer. (The above characters based mainly on *L. dactylopii* Howard.)

Paraleptomastix Girault does not seem to be so closely related, as it is a large, robust form of different sculpture and metallic coloration; the head menisciform, the scrobes very short (no facial ridge mentioned by Girault), the antennae slenderly clavate, the funicle joints becoming shorter and thicker distad, the sixth being a little wider than long, the pedicel less than half as long as the first funicle joint; wings probably much wider than in *Tanaomastix*, as the costal cell is wide; stigmal vein curved, longer than the marginal; the hind legs compressed, the femora narrowly exfoliate.

The species of *Tanaomastix* are parasitic in mealybugs of the genus *Pseudococcus* so far as known. In life the wings are held semivertically erect over the back, at least in *abnormis*, a habit quite unique among the Encyrtinae.

***Tanaomastix claripennis*, n. sp.**

Fig. 7, A

FEMALE

Head wider than in *T. abnormis*, the frontovertex about one-fourth wider than long and coarsely alutaceous or granulose; ocelli large, in an obtuse-angled triangle, the posterior pair about their own diameter from the occipital margin and fully twice as far from the eye-margin; eyes about one-fifth longer than wide, with a fine, sparse pubescence; cheeks about as long as the width of eyes; face as wide as long, the antennal scrobes narrow, rather deep and not uniting above, the facial ridge hardly elevated. Antennae (fig. 7, A) noticeably less slender than in *abnormis*; the scape somewhat expanded below, its greatest width just distad of the middle a little more than one-fourth the length exclusive of the radicle; pedicel as long as the first funicle joint; funicle joints about equal, all about twice as long as wide; club hardly wider than funicle, as long as the two preceding joints and one-half of the next combined, its three joints subequal, the apex pointed. Wings considerably wider than in *abnormis*, uniformly ciliated; the speculum wide, not quite reaching stigmal vein nor more than three-fifths of the distance to the posterior margin. Legs as in *abnormis*, except that the middle tibial spur and the first tarsal joint are each considerably shorter than the last four tarsal joints combined. Length, 1.0 mm.

Frontovertex orange yellow, with the oecipital margin dusky; face, cheeks and sides of head yellowish white, the cheeks slightly dusky on the sides; the face with a narrow, dark brown band on each side connecting the lower corner of the eye with the base of the antenna; oeciput dilute blackish brown; the notum of thorax and apical half of abdomen above and below brownish black, the lateral margin of mesoseutum and the axillae pale orange yellow, the metanotum, propodeum, metapleura and basal half of the dorsum of abdomen pale brown; underparts of thorax otherwise yellowish white, and most of the basal half of the venter dusky white. Antennae dark brown, the scape with a white triangular spot on the outer and inner surface beginning almost at the base, not quite reaching the dorsal margin but reaching to the middle on the ventral margin, with a narrow, oblique, curved band running from the dorsal margin a trifle beyond the middle to the ventral margin just before the apex. Legs yellowish white, the middle coxae dark brown, the fore and hind tibiae on dorsal margin, all femora on dorsal margin at apex, and the fore and hind tarsi, pale brownish or dusky, the middle tibiae and tarsi very dilute brownish yellow with the first tarsal joint and the spur whitish. Wings hyaline, the veins brown. Pubescence of thorax pale brown and inconspicuous.

Described from two females (type and paratype) reared from *Pseudococcus ryani* (Coquillett), Pasadena, California (C. P. Clausen), Clausen no. 56.

Tanaomastix abnormis (Girault)

Fig. 7, B

Leptomastix sp. Viereck, Monthly Bulletin, Cal. State Comm. Hort., vol. 4, p. 208, fig. 36-38, April, 1915.

Paraleptomastix abnormis Girault, Entomologist, vol. 48, p. 184, August, 1915.

Paraleptomastix abnormis H. S. Smith, Jour. Econ. Ent., vol. 10, p. 262-68, figs. 9-13, pls. 13-14, April 21, 1917.

As compared with *T. claripennis* this species has the frontovertex no wider than long, the face longer than wide, with the facial ridge more elevated, the antennae (fig. 7, B) much slenderer, each funicle joint being about three times longer than thick, and the middle tibial spur considerably longer. It has about the same coloration, excepting the following points: the frontovertex paler orange yellow, the face without dark marks, the notum of thorax varying from dark to pale brown, the base

of the abdomen more whitish, the legs paler, the scape of the antenna except the dorsal margin and the apex of the pedicel white, and the wings conspicuously trifasciate, the bands due both to integumentary pigment and to the ciliation.

A female reared from a *Pseudococcus* on *Citrus* (not *Pseudococcus citri* Risso), Okitsu, Japan, July, 1914 (Kuwana), California State Insectary no. 783, is entirely similar to specimens from Sicily, except that the blackish streak on the dorsal margin of the scape does not quite reach the apex. This species has been introduced into southern California from Sicily to help reduce the citrus mealybug (*Pseudococcus citri* Risso), and, according to the latest reports, has become established.

***Tanaomastix albiclavata* (Ashmead)**

Aphycus albiclavatus Ashmead, Proc. U. S. Nat. Mus., vol. 29, p. 404, 1905.

This species as compared with *T. abnormis* has a thicker, narrower head, with the frontovertex nearly twice longer than the posterior width, the dorsal orbits of eyes slightly converging behind, the ocelli in an acute angle, the posterior pair close to the eye-margin, the scape subexpanded below, the scutellum more acute at apex, and the spur of the middle tibiae fully one-half as long as the tarsi.

The above notes are based on one female from the Philippine Islands (undoubtedly from the vicinity of Manila), reared from a *Pseudococcus* species, and received from the California State Insectary. It agrees with Ashmead's type specimen, which is a female, and not a male, as stated in the original description.