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NEW NEOTROPICAL FULGOROIDEA

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Six monotypic species are described as new in this paper, and for the reception of four of them it has proved necessary to erect a new genus in each of the following families: Cixiidae, Dictyopharidae, Tropiduchidae, and Lophopidae. The specimens on which the descriptions are based are in the collection of the American Museum of Natural History, having been taken in Brazil, Peru, and the Canal Zone.

One specimen, described below in the new genus *Protachilus*, proved difficult to place with any certainty, and its present inclusion in the Dictyopharidae must be considered tentative pending discovery of further evidence of affinity that may be obtainable from a study of the male genitalia. Regarding the lophopid, it is to be noted that in 1931, Muir (Proc. Hawaiian Ent. Soc., vol. 7, p. 476) described a new genus, *Carrionia*, in this family and transferred *Hesticus* Stål from the Dictyopharidae, and indicated that these two genera were the only representatives of the Lophopidae in South America. The Peruvian genus described below is accordingly the third to be recorded from the Neotropical region.

Cixiidae

PARACIXIUS, NEW GENUS

Vertex at greatest length longer than broad (2.2 to 1), projecting before eyes for half their length, anterior margin transverse, lateral margins carinate, an oblique transverse carina arising near anterior level of eyes and reaching anterior margin at middle, forming an elongate areolet on each side, posterior margin angularly excavate, disc deeply sunken; frons in middle line as long as wide, width at base one-

third width at widest part, lateral margins carinate, sinuate, distally ampliate, median carina forked in basal fifth, median ocellus present, a trace of an elongate fenestra sublaterally at level of antennae; clypeus medially carinate. Pronotum one-third as long as vertex in middle, median carina distinct, lateral carinae curved anteriorly distally, approximately following hind margin of eyes, posterior margin deeply angularly excavate, curved cephalad at sides; mesonotum as long as broad, disc shallowly convex, distinctly tricarinate. Post-tibiae armed with four spines, two at base minute, two larger near middle.

Tegmina with Sc+R and M arising separately from basal cell, Sc+R forked a little basad of middle, M forked about level of stigma, Cu₁ forked at level of middle of claval suture; six subapical cells, Sc with three apical cells, R with three, M with five, Cu₁ with three; calval veins uniting in basal third of clavus. Wings with Sc simple, R with one fork, M with one, Cu₁ with two.

Pygofer medially excavate on ventral posterior margin, with a short medioventral process. Anal segment long, anal foramen near apex.

GENOTYPE: *P. armiger*, new species.

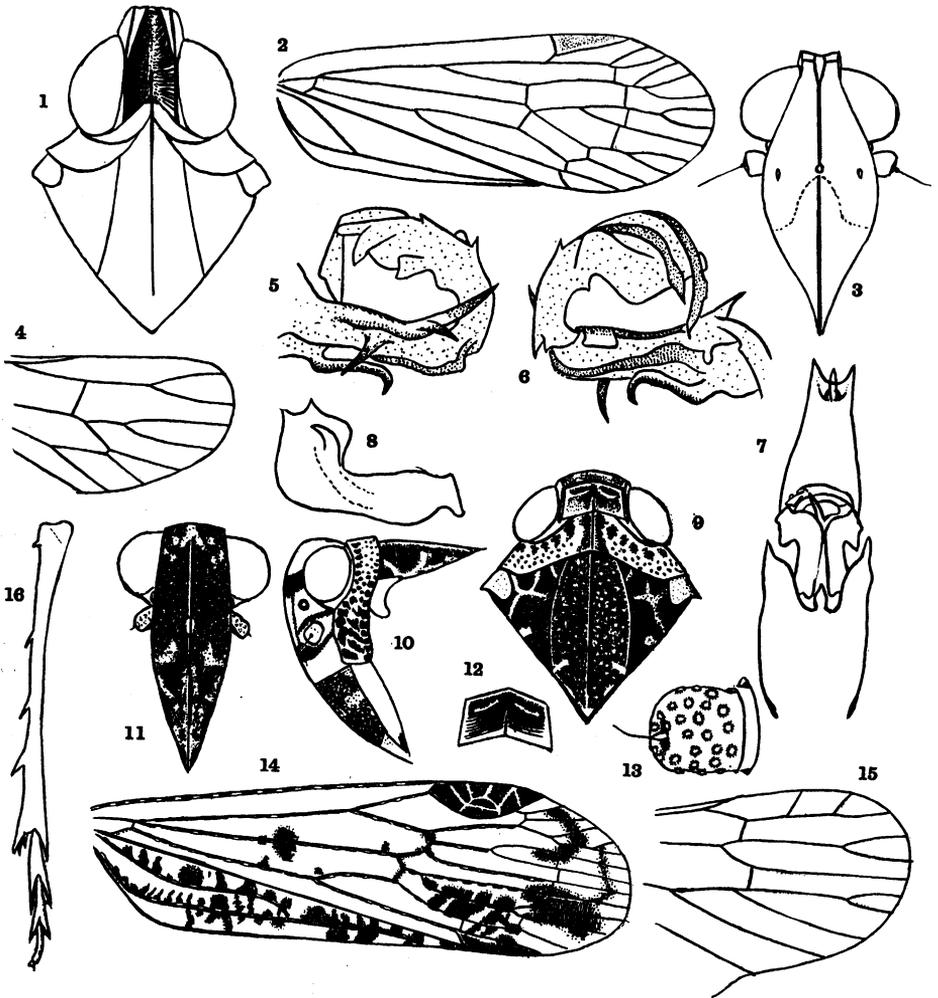
Paracixius armiger, new species

Figures 1-8

MALE: Length, 4.5 mm.; tegmen, 5.5 mm.

Frons pale fuscous, clypeus testaceous, vertex except on lateral carinae, anterior portion of genae, pronotum before lateral carinae, mesonotum anteriorly and in a large patch on each lateral field, and sclerites of abdomen fuscous; lateral carinae of vertex, pronotum basad of lateral carinae, mesonotum medially and basally,

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- Fig. 1. *Paracizius armiger*, new species, head and thorax, dorsal view.
 Fig. 2. Idem, right tegmen.
 Fig. 3. Idem, head, frontal view.
 Fig. 4. Idem, apical portion of wing.
 Fig. 5. Idem, aedeagus, left side, ventrolateral view.
 Fig. 6. Idem, aedeagus, right side, lateral view.
 Fig. 7. Idem, pygofer, genitalia, and anal segment, not quite mid-ventral view.
 Fig. 8. Idem, left genital style, lateral view on inner surface.
 Fig. 9. *Protachilus rex*, new species, head and thorax, dorsal view.
 Fig. 10. Idem, head and pronotum in profile.
 Fig. 11. Idem, head, frontal view.
 Fig. 12. Idem, vertex.
 Fig. 13. Idem, antenna.
 Fig. 14. Idem, right tegmen.
 Fig. 15. Idem, apical portion of wing.
 Fig. 16. Idem, hind tibia and tarsus, dorsal view.

sternum and legs testaceous to stramineous. Head and thorax sparsely powdered emerald green.

Tegmina and wings hyaline, stigma pallid except narrowly along inner margin, where fuscous; veins fuscous.

Pygofer fairly long, posterior ventral margin deeply excavated in middle, with a short subtriangular horizontal process medially. Anal segment long, porrect, fairly broad, dorsally moderately convex, sides very shallowly convex basally, tapering distally, anal foramen close to apical margin, apical margin excavate, lateral angles pointed, telson short and narrow. Aedeagus straight with a spiniferous flagellum distally curved dorsally and to right, looping to point ventrally at its tip; a stout spine, decurved at tip, arising on right side at base of aedeagus, a vertical spine directed ventrally on ventral side of aedeagus about middle, two stout spines dorsally on left side, one much longer than the other; flagellum with two short spines on upper margin and a pair of subparallel sclerotized curved bands near and at apex. Genital styles broad, curved through 90 degrees and expanded distally, apical margin with a short excavation bounded by two eminences; on inner face of each style a tapering short curved process directed posteriorly.

HOLOTYPE: Described from one male taken at Barro Colorado, Canal Zone, by H. F. Schwarz on March 15, 1933.

The genus *Paracixius*, which has the tegmina very shallowly tactiform and the abdomen not laterally compressed, is probably most nearly related to *Cixius* Latreille but differs considerably in the shape of the vertex, the lateral extension of the margins of the frons, in details of the tegminal venation, especially in having the union of the claval veins much more basad, in the absence of setae on the tegminal veins, and in the wing venation, most notably in the first branch of the cubitus.

Dictyopharidae

PROTACHILUS, NEW GENUS

Vertex twice as broad as long, anterior margin convex in an obtuse angle, ex-

tending to level of anterior margin of eyes, posterior margin angularly excavate, subparallel to anterior, lateral margins carinate, slightly diverging posteriorly, median carina present only in basal half, a short crescentic carina on each side in anterior half of vertex subparallel to anterior margin, disc of vertex sunken, lowest point at middle; base of frons broadly visible from above; frons longer than broad (1.6 to 1), basal margin truncate, lateral margins diverging gradually, almost straight to below level of antennae and then slightly incurved to suture, median carina distinct, more feeble at base; clypeus slightly tumid, medially and laterally carinate; frons and clypeus in profile shallowly convex; median ocellus absent; labium with apical joint less than half length of penultimate; antennae with first segment very short, second segment subglobose, studded with distinct round pits, indented apically at point of insertion of third segment; antennal flagellum apparently rather short, situated terminally at middle of distal surface of third segment; head with eyes not quite so broad as pronotum. Pronotum in middle about as long as vertex in middle or very slightly longer, anterior margin convex between eyes, posterior margin angularly excavate, turning cephalad laterally; disc flattened, or very slightly convex, median carina distinct, lateral carinae of disc absent, a weak carina at each margin between eye and tegula, lateral fields of pronotum below eyes a little longer than broad; mesonotum broader than long, disc elongate oval, almost flat, tricarinate, lateral carinae convex, slightly curving inwards at base, scutellum short, subrectangularly pointed at tip. Pro-tibiae 1.5 times as long as pro-femora, post-tibiae armed with four spines before apex, the first spine small and near base; a row of seven spines at apex; second joint of hind tarsus subequal to third joint in ventral view, distal margin concave, a spine at each angle, distal margin of first and second joints bordered with an even row of minute teeth (approximately 20 and 14, respectively), with a distal fringe

of short setae each almost as stout as one of the teeth.

Tegmina approximately four times as long as wide, widest across membrane, apical margin evenly rounded; Sc+R forking before stigma at a distance equal to its length, M forking about halfway between level of Sc+R fork and base of stigma. Cu₁ forking near middle of tegmen, R with four apical cells, M with six, Cu₁ with two; a complete line of transverse veins subparallel to apical margin; first vein of clavus joining second at about middle, a transverse vein between Cu₂ and first claval vein; the common claval stalk entering commissural margin before apex of clavus; apex of clavus closed, approximately three-quarters from base of tegmen; no cross veins on corium apart from R-M and M-Cu, nor on membrane apart from subapical line. Tegmina devoid of granulation and setae. Wings with Sc simple, R forked twice before apex, M with anterior branch forked near margin, posterior branch simple, Cu_{1a} forked twice, Cu_{1b} simple.

Anal segment of female long, fully three times as long as wide, apical margin medially excavate, telson not projecting beyond margin, anal foramen comparatively small. Third valvulae not quite so broad as long, rounded distally, apical portion abruptly membranous with distal margin rounded; first valvulae moderately long, straight on dorsal margin, shallowly convex on ventral margin, tapering distally with a row of seven teeth on dorsal margin; a semi-membranous lobe of equal size attached ventrally at base; second valvulae as long as first, slender, tapering distally.

GENOTYPE: *P. rex*, new species.

Protachilus rex, new species

Figures 9-21

FEMALE: Length, 7.5 mm.; tegmen, 10.5 mm.

Vertex, frons, clypeus, and lorae fuscous-piceous finely speckled with pallid yellow, lateral margins of vertex at base yellow, genae yellow with a fuscous-piceous oblique band before eye, a second above and a third beneath antenna; pronotum speckled fuscous and dull yellow in equal

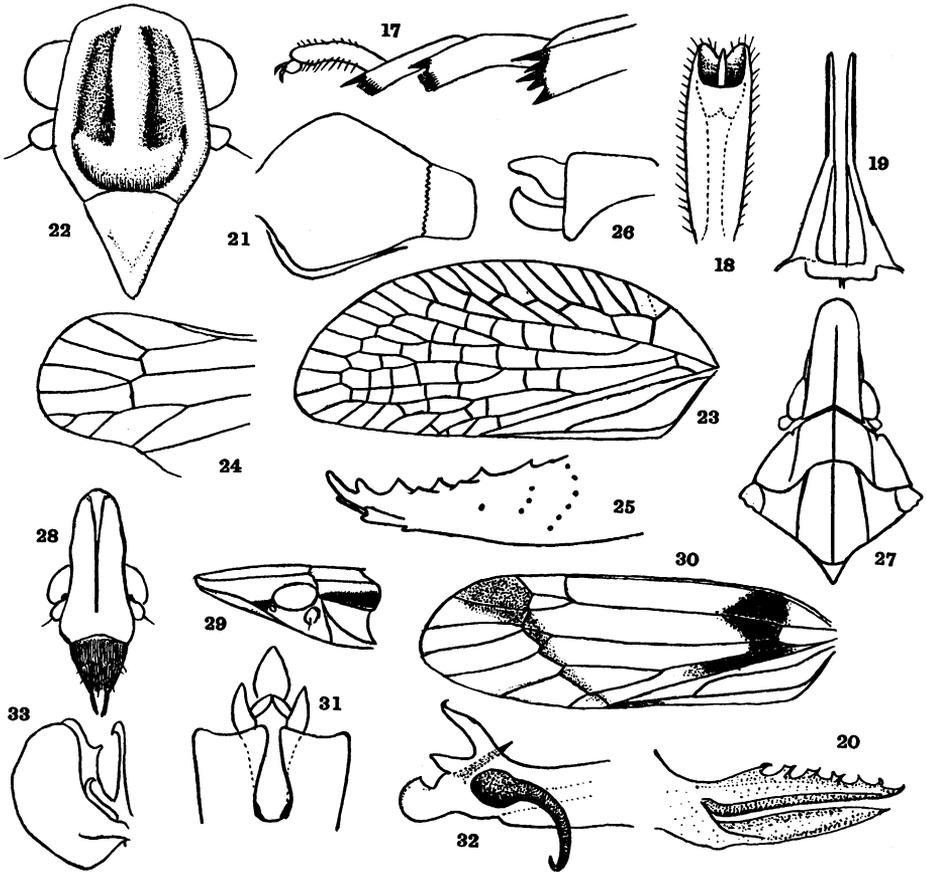
amounts; mesonotum with lateral fields piceous, an oblique pallid line anteriorly meeting lateral carinae of disc, an approximately Y-shaped pallid mark at lateral angles, a pale spot halfway along posterior margin, disc fuscous with minute pale spots, a short oblique pallid line near base of each lateral carina directed anteromedially, tip of scutellum pallid; sternum fuscous and pale in subequal patches; pro- and meso-femora and tibiae fuscous speckled pallid, with three paler bands, post-femora testaceous with two fuscous bands, post-tibiae testaceous, fuscous speckled with testaceous in grooves.

Tegmina hyaline, a brown spot across M in corium at middle, a series of short brown bars between claval veins, a brown suffusion with a tendency to barring on posterior half of membrane, a few scattered infuscate spots distad of subapical line, stigma fuscous with its venules paler; veins alternately piceous and pallid ivory, transverse veins of nodal line fuscous, of subapical line transparent, pale. Wings hyaline, veins fuscous.

First valvulae of ovipositor with seven teeth, the basal tooth simple, twisted, the second, third, and fourth bicuspidate with the accessory cusp much less sclerotized than the primary, the fifth tooth very short and broad across the base, the sixth and seventh moderately long and curved; second valvulae slender, rod-like, parallel, equal in length to first, ornamented with a membranous convex lobe on dorsal margin near apex.

HOLOTYPE: Described from one female collected at Sant' Anna do Chapada, near Cuyabá, Brazil, very probably by H. H. Smith, as it was donated to the Museum by his wife in 1922. A second female specimen was later seen at the United States National Museum.

The affinities of this genus are puzzling. It appears to be closest to *Cladodiptera* Spinola, though it differs very markedly in head structure and in tegminal venation. The head is slightly reminiscent of *Taosa* Distant, while the speckled coloration is reproduced in a much slighter degree in such genera as the African *Paranagnia* Melichar. The ovipositor and anal seg-



- Fig. 17. *Protachilus rex*, new species, hind tarsus, lateral view.
 Fig. 18. Idem, anal segment, dorsal view.
 Fig. 19. Idem, second valvulae of ovipositor, ventral view.
 Fig. 20. Idem, first valvula of ovipositor, left side, lateral view.
 Fig. 21. Idem, third valvula of ovipositor, lateral view.
 Fig. 22. *Alcestis quadrata*, new species, head, frontal view.
 Fig. 23. Idem, left tegmen.
 Fig. 24. Idem, apical portion of wing.
 Fig. 25. Idem, first valvula of ovipositor, right side, lateral view.
 Fig. 26. Idem, anal segment of female, lateral view.
 Fig. 27. *Biruga chapadae*, new species, head and thorax, dorsal view.
 Fig. 28. Idem, head, frontal view.
 Fig. 29. Idem, head and pronotum in profile.
 Fig. 30. Idem, left tegmen.
 Fig. 31. Idem, pygofer and anal segment of male, dorsal view.
 Fig. 32. Idem, aedeagus, right side, lateral view.
 Fig. 33. Idem, right genital style, lateral view.

ment conform to the general type found among species of *Taosa*. In the second specimen examined there are traces of lateral carinae on the frons basally.

Tropiduchidae

ALCESTIS STÅL

Alcestis STÅL, 1862, K. Svenska Vetensk.-Akad. Handl., vol. 3 (for 1859-1860), art. 6, p. 11.

GENOTYPE: *A. pallescens* Stål, *loc. cit.*

Alcestis quadrata, new species

Figures 22-26

FEMALE: Length, 5.0 mm.; tegmen, 7.2 mm.

Frons longer than broad (1.2 to 1), median carina broad, anchor-shaped, post-tibiae with three spines. Tegmina with Sc enclosing 12 cells at margin and with a row of five submarginal cells; basal costal cell four-sided, the distal sides short and meeting in an obtuse angle.

Stramineous; tegmina and wings hyaline. In life, insect probably pallid green with veins green.

Anal segment of female very short, apically truncate; telson two-thirds as long as segment. Ovipositor with third valvulae fairly broad, ventral margin convex, dorsal margin straight with a finger-shaped setigerous lobe lying along it to near apex, apex with seven short curved teeth, four on margin, three subdorsal, somewhat basad; first valvulae long, tapering distally, slightly curved, each with a thin semi-membranous lobe of same shape lying against its inner face; dorsal margin with six large teeth and two very small intercalary teeth, ventral margin with one bicuspidate tooth and one simple tooth directed horizontally at apex; a single minute eminence laterally at middle, with a curved row of three basad of it and a second row of six still further basad; second valvulae semi-membranous, thin, short, tapering evenly and rather abruptly distally.

HOLOTYPE: Described from one female taken at Sant' Anna do Chapada, Brazil, probably by H. H. Smith.

This species is near *solitaria* Melichar

but differs in the shape of the basal costal cell and in size.

BIRUGA, NEW GENUS

Vertex about three times as long as eyes, longer in middle than broad across base (1.7 to 1), anterior margin strongly curved, lateral margins straight, finely carinate, diverging slightly towards base, posterior margin angularly excavate, disc depressed, median carina narrow, very distinct, not reaching apical margin; frons nearly twice as long as broad, lateral margins expanding from base to above level of eyes, then very slightly tapering and further distad diverging to below level of antennae and bending abruptly inward to suture, carinate, median carina stout at base, narrowing distally, absent on apical fifth; clypeus devoid of median and lateral carinae. Pronotum in middle two-thirds length of vertex, median and lateral carinae distinct, fine, a strong thin carina between eye and tegula, pronotal surface between carinae depressed; mesonotum much broader than long, disc subquadrate, tricarinate, lateral carinae slightly convex, diverging to base. Hind tibiae with a minute spine near base and two spines in apical third.

Tegmina nearly three times as long as broad, asymmetrically rounded at apex, Sc+R forked at level of stigma, M forked immediately before nodal line of cross veins, Cu₁ forked three-eighths from base, claval veins uniting slightly basad of level of Cu₁ fork, three subapical cells (Sc, M, Cu₁), seven apical excluding stigmal cell. Wings with R and M simple to apical margin.

Pygifer very deeply cleft dorsally.

GENOTYPE: *B. chapadae*, new species.

Biruga chapadae, new species

Figures 27-33

MALE: Length, 3.2 mm.; tegmen, 3.0 mm.

Testaceous, probably greenish in life; a horizontal band before eye, median carina of pronotum, and a band on pronotum behind each eye tinged red; clypeus, sternum, and sclerites of abdomen fuscous.

Tegmina hyaline, costal cell opaque

pallid yellow, a broad fuscous band across basal fifth; apical cells of Sc and a very narrow band along and inside transverse cross veins to apex of clavus paler fuscous; veins testaceous. Wings hyaline with testaceous veins.

Pygofer deeply cleft dorsally. Anal segment arising at base of cleft, fairly long, with lateral margins setigerous, expanding distally, telson approximately ovate in dorsal view, projecting about two-thirds beyond apex of segment. Aedeagus moderately short, laterally compressed, dorsal margin shallowly concave, ventral margin slightly convex, unequally trilobed in a vertical plane at apex, roughly E-shaped, the dorsal lobe sinuately tapering, with a recurved hook at tip, the middle lobe shortest, abruptly tapering, the ventral lobe longest, rounded, assuming a sub-falcate form by reason of a membranous lobe dorsally; a very stout ventrally incurved process on right side near apex and a narrow, straight spine directed obliquely dorsad and cephalad at almost same level on left side, the former process with its basal portion swollen.

HOLOTYPE: Described from one male taken at Sant' Anna do Chapada, Brazil, probably by H. H. Smith.

This genus is apparently nearest to *Athestia* Melichar but differs markedly in its general shape and tegminal venation. It is interesting to note the appearance in this species of the same basic color pattern of the tegmina as is found in *Achilorma bicincta* Spinola.

Lophopidae

UCAYALIA, NEW GENUS

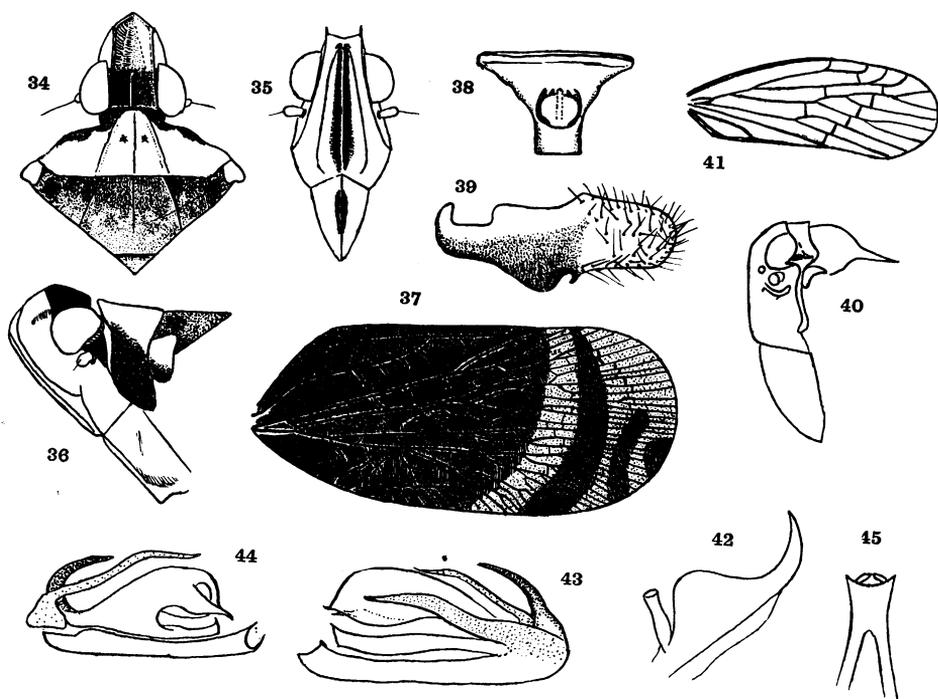
Vertex longer than broad (1.9 to 1), anterior margin angularly convex, lateral margins straight, slightly diverging basally, posterior margin transverse, disc deeply sunken, median carina distinct in basal two-fifths, absent distally; frons in middle longer than wide at widest part below antennae (1.3 to 1), base slightly more than half as wide as apex, concave, lateral margins slightly concave, diverging to below level of antennae, thence incurved to suture, median and lateral carinae distinct,

not quite reaching to apex, the surface between the lateral carinae slightly elevated; clypeus about half as long as frons, lateral margins carinate in basal half, median carina distinct; genae broad, ocelli absent; frons and clypeus in profile straight, suture impressed, clypeus rectangular distally. Head with eyes a little more than half as wide as pronotum. Pronotum two-thirds as long as vertex in middle, anterior margin bluntly pointed on disc, sinuately convex laterad, posterior margins straight, curved cephalad near sides, disc of pronotum elevated, tricarinate, lateral carinae straight, diverging basally, an impressed spot on each side near middle of disc; mesonotum twice as broad as long, disc at base broader than long, almost flattened except anteriorly, tricarinate, lateral carinae strongly diverging basad, apex of scutellum marked off by a transverse constriction. Pro- and meso-femora and tibiae flattened and much expanded, pro-femora with sides straight, diverging distally, apically truncate; tibiae almost straight on inner margin, convex on outer; post-tibiae not expanded, with three spines before apex.

Tegmina very shallowly tectiform, broad, costal and commissural margins almost parallel, apical margin bluntly convex, apical and sutural angles subequally rounded; precostal area short, beginning at basal fifth of margin and ending just before level of apex of clavus; Sc+R forking near base, M and Cu₁ forking at approximately same level near middle of tegmen, longitudinal venules of membrane numerous, cross veins irregular, apical line of cross veins regular, nodal line very irregular or indistinct, two irregular series of cross veins between apical and nodal series.

Pregenital segment with a rounded eminence medially. Ovipositor with third valvulae fully two and one-half times as long as broad, obliquely falcate distally, rounded basally, beset with stout setae, dorsal margin not sclerotized. Anal segment of female placoid, with a short basal stalk, anal foramen situated at distal end of stalk, telson short, broad, distal plate like part of segment deflexed, vertical. Waxy secretion on anal segment dull white.

GENOTYPE: *U. nigrovittata*, new species.



- Fig. 34. *Ucayalia nigrovittata*, new species, head and thorax, dorsal view.
 Fig. 35. Idem, head, frontal view.
 Fig. 36. Idem, head in profile.
 Fig. 37. Idem, left tegmen.
 Fig. 38. Idem, anal segment of female, dorsal view.
 Fig. 39. Idem, third valvula of ovipositor, lateral view.
 Fig. 40. *Cedusa irengana*, new species, head and pronotum in profile.
 Fig. 41. Idem, right tegmen.
 Fig. 42. Idem, left genital style.
 Fig. 43. Idem, aedeagus, left side.
 Fig. 44. Idem, aedeagus, right side.
 Fig. 45. Idem, anal segment of male, dorsal view.

***Ucayalia nigrovittata*, new species**

Figures 34-39

FEMALE: Length, 8.5 mm.; tegmen, 9.1 mm.

Head and pronotum dull yellow; a broad band overlying median carina of frons, a narrower band along median carina of clypeus, posterior half of vertex, sides of head above eyes, lateral fields of pronotum and ventral half of tegulae, fore and middle legs piceous; mesonotum dully infusate with two darker suffusions outside disc on each side anteriorly; hind legs and abdomen fuscous.

Tegmina yellowish brown, semitrans-

parent in membrane, piceous brown on corium and reddish brown in three very sharply defined bands on membrane, the first broad, arcuate subparallel to apical margin, passing from nodal area to near apex of clavus, the second somewhat narrower, arising on apical margin and terminating near middle of membrane, the third ovate, lying on apical margin anterior of middle. Wings uniformly paler reddish brown.

HOLOTYPE: Described from one female taken on the middle Río Ucayali, Peru, by H. Bassler, on March 25, 1929.

Derbidae

CEDUSA FOWLER

Cedusa FOWLER, 1904, *Biologia Centrali-Americana*, Insecta, Rhynchota, Hemiptera-Homoptera, vol. 1, p. 112.

GENOTYPE: *C. funesta* Fowler, *loc. cit.*; Muir, 1913, *Bull. Exp. Sta. Hawaiian Sugar Planters' Assoc.*, Ent. Ser., no. 12, p. 35.

Cedusa irengana, new species

Figures 40-45

MALE: Length, 1.9 mm.; tegmen, 2.9 mm.

Fuscous; rostrum, except distal segment, and legs with tarsi testaceous; apical segment of rostrum piceous; membrane of abdomen red.

Tegmina and wings pale smoky, both powdered pale gray, veins fuscous.

Anal segment of male tubular with sides concave, anal foramen near apex. Aedeagus straight, tubular, with a reflexed

flagellum at apex; two recurved spinose processes dorsally on right at apex, one relatively stout and evenly curved obliquely cephalad, the other distinctly longer, sinuate, almost horizontal in apical quarter; on left side at apex a broad sinuate tapering lobe directed cephalad, more nearly inclined to horizontal than preceding; flagellum in form of a sclerotized hood-like lobe with a subsidiary tapering process near apex on right side, and a short point at tip, the whole underlain by a sclerotized band forming a loop in a horizontal plane. Genital styles with ventral margin slightly convex, dorsal margin strongly convex with a rather long narrow stylar process near base and a very stout incurved spine at apex.

HOLOTYPE: Described from one male labeled "Ireng R. to Roraima, Brazil, Aug. 17, 1911."

This species differs in coloration from *venosa* Fowler and *funesta* Fowler.

