

**Supplement to a Taxonomic Study
of the Planthopper
Genus *Cedusa* in the Americas
(Homoptera: Fulgoroidea: Derbidae)**

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ABSTRACT. — This study supplements and expands our knowledge of the planthopper genus *Cedusa* in the Americas. Fifty-six species are described as new: *andara* (Panama), *aziza* (Mexico), *belma* (Panama), *bolopa* (Brazil), *carropia* (Panama), *catasia* (Panama), *dilbata* (Panama), *drilda* (Guatemala), *edox* (Panama), *enosala* (Panama), *febora* (Panama), *flynni* (Argentina), *gonuga* (Panama), *grancara* (Mexico), *hampora* (Panama), *hyola* (Mexico), *impada* (Panama), *isinara* (Mexico), *janola* (Panama), *jarata* (Mexico), *jinwista* (Guyana), *kalala* (Mexico), *kinoxa* (Panama), *lumeda* (Panama), *marlota* (Panama), *nortoma* (Panama), *noxora* (Mexico), *olasca* (Panama), *ozda* (Mexico), *pacuta* (Brazil), *pipsewa* (Panama), *poochia* (Costa Rica), *quimata* (Mexico), *quinteca* (Dominican Republic), *quixoa* (Panama), *reota* (Panama), *roseifrons* (Mexico), *senbara* (Panama), *siopa* (Mexico), *tuvaga* (Panama), *ulora* (Ecuador), *unsera* (Panama), *uzama* (Mexico), *varopa* (Brazil), *vidola* (Panama), *widisca* (USA, Texas), *wontula* (Panama), *woodyga* (Panama), *xenga* (USA, Florida), *xipola* (Panama), *xumara* (Ecuador), *yarosa* (Argentina), *yipara* (Brazil), *yowza* (Panama), *zantata* (Panama) and *zaxoza* (USA, Florida). A key to species is presented, and all diagnostic features are illustrated.

The greatest stimulus to expanding our knowledge of the species comprising a large and poorly known genus is the production of a work that treats all of the previously described species and some new ones in a single comprehensive study. The derbid planthopper genus *Cedusa* Fowler, whose members occur throughout the Americas, is such a genus. Flynn and Kramer (1983) provided a comprehensive study of *Cedusa* and included 91 species. Since the appearance of that study, 56 additional new species have been discovered and their descriptions are presented here to further increase our understanding of the genus.

Cedusa now holds 147 species and is the largest genus in the family Derbidae from a world viewpoint. Thirty-two species are known from continental United States and Canada, 41 from Mexico, 59 from Central America, 12 from the West Indies, and 27 from South America. The Neotropical Region is still incompletely collected and studied; so, we can be certain that many more species await discovery.

This contribution is intended to supplement Flynn and Kramer (1983) and must be used in conjunction with that study. General information found in it is not repeated here.

Several items should be mentioned in regard to the descriptions that follow. Most of the species that appear black with the unaided eye are in fact dark red-brown or fuscus under the microscope. The apical segment of the labium is almost always distinctly darker than the pre-apical ones. The distal crossveins of the forewings are almost always paler than the other veins, and in many cases they are white or whitish. The drawings of the left and right lateral views of the aedeagi may not be precise lateral views. Some liberty was taken here so that all of the complexities of the structures could be shown, but the resulting minor distortion should prove to be more helpful than harmful. Unless the left paramere was radically different from the right paramere, only the right paramere was illustrated. No reliable features were found to separate females, and their determination can only be made by association with males.

Fifty-one of the holotypes are in the collection of the United States National Museum of Natural History, Washington, D.C.; the other five are in the Canadian National Collection, Ottawa.

All specific names, unless otherwise stated, are arbitrary combinations of letters and should be treated as nouns in apposition.

KEY TO SPECIES OF *CEDUSA* DESCRIBED IN THIS STUDY

1. Forewings with ground color ivory white and appearing maculate due to variable embrowning of cells; anterior tibiae banded with one or more brown rings; mesonotum bicolored with longitudinal markings **2**
- One or more of the above features absent **8**
2. Right paramere with subquadrate constriction on inner margin just beyond middle (Fig. 3) **(1) nortoma**
- Right paramere without such constriction **3**
3. Aedeagus with long slender almost whip-like process, conspicuously longer than others, on dorsal margin **4**
- Aedeagus with processes on dorsal margin subequal in length ...
..... **5**
4. Conspicuous process on dorsal margin of aedeagus originating from slender base (Fig. 4); distal portions of parameres strongly dissimilar (Figs. 6-7) **(2) impada**
- Conspicuous process on dorsal margin of aedeagus originating from broad base (Figs. 8-9); distal portions of paramere approximately alike **(3) marlota**
5. Basal portion of aedeagal shaft broader and stouter than distal portion (Figs. 12, 16) **6**
- Basal portion of aedeagal shaft not broader and stouter than distal portion (Figs. 19, 22) **7**
6. Aedeagus with four long apical processes on dorsal margin; long slender process on ventral margin of aedeagus originating in proximal half and extending nearly to apex (Figs. 11-12) ... **(4) reota**
- Aedeagus with two long apical processes on dorsal margin; without process on ventral margin originating in proximal half of aedeagus (Figs. 15-16) **(5) dilbata**
7. Apex of flagellum terminating with two avicephaliform processes (Figs. 18-19) **(6) tuvaga**
- Apex of flagellum terminating with simple, single, slightly upturned process (Figs. 21-22) **(7) feboria**
8. Mesonotum bicolored with longitudinal markings; forewings with veins largely pale and cells lightly embrowned; paramere with large, sharp triangular projection on inner margin in basal half (Figs. 26, 29) **9**
- Mesonotum unicolored, rarely with vague dark or pale areas; forewings with color variable; paramere not as above **10**
9. Aedeagus in left lateral view with single process originating near base of flagellum and extending cephalad, process not uniformly tapered (Fig. 24) **(8) edox**

- Aedeagus in left lateral view with pair of processes originating near base of flagellum and extending cephalad, processes uniformly tapered (Fig. 27) **(9) *drilda***
- 10. Head, pronotum, and mesonotum yellow-orange to pale orange and unmarked; forewings largely pale and vaguely tinted with yellow-orange to pale brown; paramere blunt apically and with blunt subapical expansion on inner margin (Fig. 32) **(10) *belma***
 - Head, pronotum, and mesonotum with color variable, but not as above; paramere not as above **11**
- 11. Forewings with ground color ivory or white to subhyaline **12**
 - Forewings with ground color some shade of brown, gray, to entirely black **16**
- 12. Mesonotum white to yellowish **13**
 - Mesonotum light brown to fuscus **14**
- 13. Forewings subhyaline with vague embrowning near claval apices; central portion of frons dark brown to fuscus; paramere with outer margin semicircular, lacking distinct hook at apex (Fig. 35) **(11) *gonuga***
 - Forewings whitish with vague embrowning near middle of costal margin; central portion of frons pale yellow-brown; paramere with outer margin straight, with large hook at apex (Fig. 38) **(12) *catasia***
- 14. Forewings maculate with brown; frons marked with dark brown; paramere without apical hook (Fig. 41) **(13) *olasca***
 - Forewings not maculate, brown markings linear or in form of clouds; frons unmarked; paramere with large apical hook (Fig. 44) **15**
- 15. Length of male 5.5 mm; antenna, antennal ledge, lateral carina of pronotum, and tegulae bright white; forewing with costal and anal margins and portions beyond distal crossveins deeply embrowned, contrasting sharply with bright white remaining portions; aedeagus with process extending beyond apex of flagellum upturned, with long and short process near base of flagellum on left side (Fig. 42) **(14) *pipsewa***
 - Length of male 4.0 mm or less; antenna and antennal ledge pale brown; lateral carina of pronotum and tegulae ivory; forewing with costal margin only partly and anal margin at claval apex lightly embrowned, less contrasting with white remaining portion; aedeagus with process extending beyond apex of flagellum down-turned, with three long processes near base of flagellum on left side (Fig. 45) **(15) *woodyga***
- 16. Right paramere in dorsal view with long lanceolate process on mesal margin (Figs. 51, 56) **17**
 - Right paramere in dorsal view without long lanceolate process on mesal margin **18**

17. Anal tube in left lateral view terminating with large apical hook and three smaller elongated teeth (Fig. 48); aedeagus with long, slender, ventral process originating near base of shaft and directed distally beyond apex of shaft (Figs. 49-50) (16) *poochia*
 — Anal tube in left lateral view terminating with moderately long dorsal and ventral projections, between them minute tooth (Fig. 55); aedeagus without long, slender, ventral process as above (Figs. 53-54) (17) *enosala*
18. Forewings with apical margins very narrowly red, ground color light brown, small white clouds especially on crossveins; apex of anal tube much enlarged (Figs. 61-62); outer margin of paramere semicircular (Figs. 60, 65) (18) *quixoa*
 — Forewings with apical margins not red, ground color brown to black, no white clouds but distal crossveins at times narrowly white; outer margin of paramere variable 19
19. Anal tube terminating with paired processes, dorsal pair short and broad, ventral pair moderately long and decurved (Fig. 70) (19) *janola*
 — Anal tube terminating simply, without processes 20
20. Flagellum comparatively massive and forming a sheath covering most of shaft (Figs. 74, 77) 21
 — Flagellum not as above 22
21. Aedeagus in left lateral view with long fin-bearing process directed basad and long simple process directed distad, both processes nearly as long as shaft (Fig. 73) (20) *kalala*
 — Aedeagus in left lateral view with moderately long, basally lobed process directed ventrad near apex, without process directed distad (Fig. 76) (21) *jarata*
22. Paramere in ventral view much narrowed at midlength (Figs. 81, 84) 23
 — Paramere in ventral view not much narrowed at midlength 24
23. Flagellum terminating with semicircular process bearing subapical fin and apical microteeth (Fig. 80) (22) *yowza*
 — Flagellum terminating truncately (Fig. 83) (23) *yipara*
24. Right paramere in ventral view without distinct hook on inner apical margin (Figs. 87, 90, 93) 25
 — Right paramere in ventral view with distinct hook on inner apical margin, hook varying from massive (Fig. 114) to small (Fig. 123) 27
25. Paramere in ventral view slightly concave on middle third of inner margin, concavity with varying number of irregular microteeth (Fig. 87) (24) *aziza*
 — Paramere not as above 26
26. Paramere in ventral view distinctly narrowed on distal third, inner distal margin with small convexity (Fig. 90); no aedeagal process

- apically branched or bearing microteeth (Figs. 88-89) (25) *quinteca*
- Paramere in ventral view not narrowed on distal third, bearing blunt projection just beyond middle of inner margin (Fig. 93), at least one aedeagal process apically branched and bearing microteeth (Figs. 91-92) (26) *zaxoza*
27. Inner margin of paramere with distinct notch (Figs. 96, 102) .. 28
- Inner margin of paramere without distinct notch (Figs. 111, 129) 31
28. Notch on inner margin of paramere beyond midlength (Fig. 96); process from base of flagellum with four rami or branches (Figs. 94-95) (27) *wontula*
- Notch on inner margin of paramere in basal half; process from base of flagellum unbranched or simple 29
29. Flagellum bulbous and simple, narrowest at midlength (Figs. 97-98) (28) *carropia*
- Flagellum not bulbous, with one or more acute processes, not narrowest at midlength (Figs. 101, 104) 30
30. Flagellum terminating with long, tapered, moderately stout process reaching base of aedeagal shaft (Figs. 100-101) (29) *hampora*
- Flagellum terminating with long, recurved, slender process not reaching base of aedeagal shaft (Figs. 103-104) (30) *lumeda*
31. Apical hook of paramere drawn out and needle-like (Figs. 108, 111) 32
- Apical hook of paramere not drawn out and needle-like (Figs. 114, 117) 33
32. Aedeagus in left lateral view with three processes originating at flagellar base, process on lower middle portion of flagellum not capitate at apex (Fig. 106) (31) *xipola*
- Aedeagus in left lateral view with two processes originating at flagellar base, process on lower middle portion of flagellum capitate at apex (Fig. 109) (32) *senbara*
33. Distal portion of flagellum directed cephalad and then curved and directed caudad (Figs. 113, 116) 34
- Distal portion of flagellum not curved as above 35
34. Aedeagus in right lateral view with apical portion of flagellum broadly expanded and angular (Fig. 113) (33) *yarosa*
- Aedeagus in right lateral view with apical portion of flagellum not broadly expanded and angular (Fig. 116) (34) *flynni*
35. Inner margin of paramere with short blunt protuberance at or near midlength (Figs. 120, 123, 126) 36
- Inner margin of paramere without such a protuberance 38
36. Flagellum comparatively simple, broadly oval, terminating with small twisted oval expansion (Figs. 118-119) (35) *andara*

- Flagellum complex, with hooks or processes 37
- 37. Aedeagus in left lateral view with three moderately long processes protruding above dorsal margin of flagellum; without massive process directed cephalad from base of flagellum (Fig. 121) (36) *jinwista*
 - Aedeagus in left lateral view with one moderately long process protruding above dorsal margin of flagellum (Fig. 124); with massive process directed cephalad from base of flagellum (Fig. 125) (37) *ozda*
- 38. Paramere with stalk or neck before apex; apical hook of paramere short (Figs. 129, 132) 39
 - Paramere without stalk or neck before apex; apical hook variable 40
- 39. Main portion of flagellum enlarged, its apex nearly reaching aedeagal base (Figs. 127-128); stalk of paramere short (Fig. 129) ... (38) *ulora*
 - Main portion of flagellum not enlarged, its apex falling far short of aedeagal base (Figs. 130-131); stalk of paramere long (Fig. 132) ... (39) *unsera*
- 40. Inner margin of paramere straight or mildly concave, paramere not markedly expanded at or near middle (Figs. 135, 138, 150) 41
 - Inner margin of paramere convex, paramere usually distinctly expanded at or near middle (Figs. 165, 174, 183) 50
- 41. Aedeagus in left lateral view with broad, dorsally serrate or dentate process at base of flagellum (Figs. 133, 136, 139) 42
 - Aedeagus in left lateral view without such process at base of flagellum 44
- 42. Process from base of flagellum simple, approximately pipe-shaped, broadly recurved toward apex (Figs. 133-134) (40) *quimata*
 - Process from base of flagellum not simple, with folds or angulations 43
- 43. Aedeagus in left lateral view with process at base of flagellum elongated, process dentate dorsally, apically prolonged to acute tip (Fig. 136) (41) *kinoxa*
 - Aedeagus in left lateral view with process at base of flagellum rounded, process serrate dorsally, not prolonged apically (Fig. 139) (42) *hyola*
- 44. Process from flagellar base unusually large, highly elaborated with subprocesses and serrations (Figs. 142-143); apical hook of paramere small (Fig. 144) (43) *xumara*
 - Process from flagellar base not so elaborated; apical hook of flagellum large 45
- 45. Dorsal-most portion of flagellum broadly elongate-oval and slightly decurved, its apex usually angular (Figs. 146, 149) 46
 - Dorsal-most portion of flagellum not as above 47

46. Aedeagus in left lateral view with process from flagellar base avicephaliform (Fig. 145) (44) *widisca*
 — Aedeagus in left lateral view with process from flagellar base pediform (Fig. 148) (45) *isinara*
47. Flagellum in right lateral view large and suboval, its distoventral margin modified as ventrally directed foot (Fig. 152) (46) *noxora*
 — Flagellum not as above 48
48. Major process from flagellar mass without distally directed subprocess on its ventral margin (Figs. 154-155); distal margin of apical hook of paramere strongly convex (Fig. 156) (47) *pacuta*
 — Major process from flagellar mass with distally directed subprocess on its ventral margin (Figs. 157, 160); distal margin of apical hook of paramere not strongly convex (Figs. 159, 162) 49
49. Face variably tinted with pink or reddish; aedeagus in right lateral view with three moderate-sized bifurcated or branched processes near base of flagellum (Fig. 158); apical portion of major process from flagellar base not sharply triangular in outline (Fig. 157) (48) *roseifrons*
 — Face not tinted as above; aedeagus in right lateral view with one large tribranched process near base of flagellum (Fig. 161); apical portion of major process from flagellar base sharply triangular in outline (Fig. 160) (49) *grancara*
50. Paramere with protuberance on inner margin near base (Fig. 165); major process from flagellar base expanded distally and tapered to acute anteriorly directed apex (Fig. 164) (50) *xenga*
 — Paramere without protuberance as above; major process from flagellar base not as above 51
51. Apex of paramere capitate with very small hook (Fig. 168); major process from flagellar base elaborated with subprocesses and serrate areas (Figs. 166-167) (51) *uzama*
 — Apex of paramere not capitate with large hook; major process from flagellar base not as above 52
52. Aedeagus in right lateral view with broad, quadrate, twice-pronged process (Figs. 170, 173) 53
 — Aedeagus in right lateral view without broad, quadrate, twice-pronged process (Figs. 176, 182) 54
53. Quadrate process near apex of shaft, prongs on dorsal margin (Fig. 170) (52) *zantata*
 — Quadrate process near middle of shaft, prongs on distal margin (Fig. 173) (53) *varopa*
54. Aedeagus in left lateral view with prominent process arising near apex and directed basad along shaft, process slender in basal half and much enlarged in distal half (Fig. 175); ventral process from flagellar base bearing slender bottle-shaped modification at apex (Fig. 176) (54) *bolopa*

- Aedeagus without structures as above 55
55. Aedeagus in left lateral view with long, tapered, apically acute process arising near middle of shaft and directed obliquely dorsad and basad (Fig. 178); aedeagus in right lateral view with major process of flagellar mass twice-pronged apically, prongs directed cephalad (Fig. 179) (55) *vidola*
- Aedeagus in left lateral view without process near middle of shaft (Fig. 181); aedeagus in right lateral view with major process of flagellar mass not as above (Fig. 182) (56) *siopa*

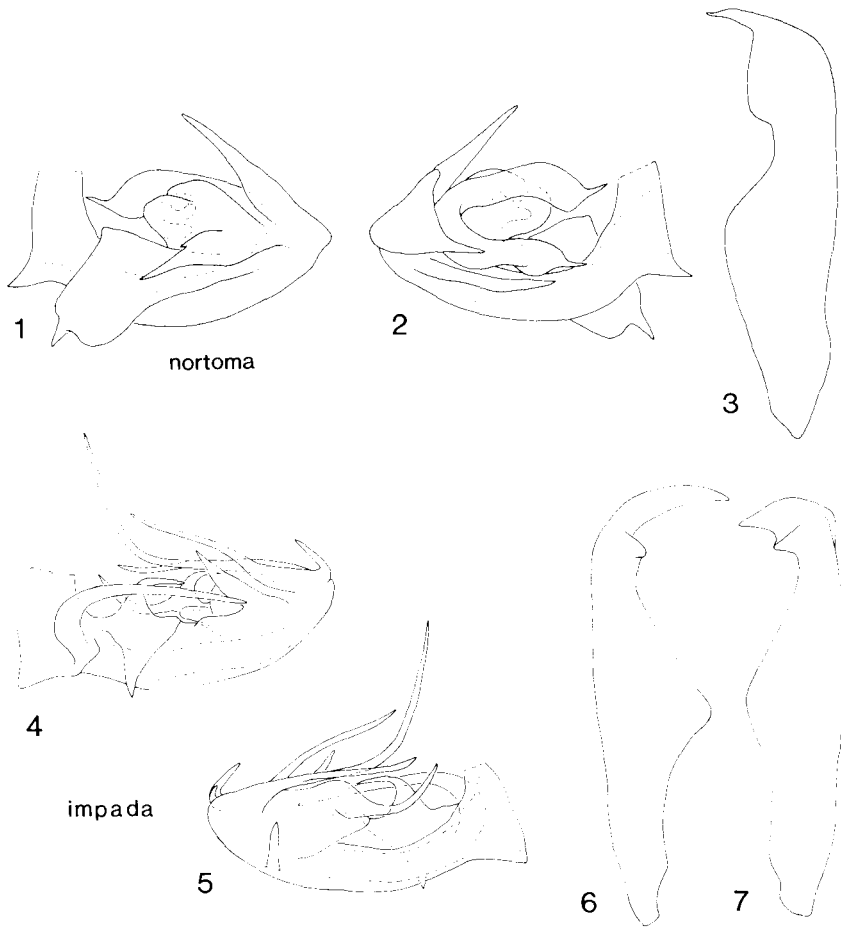
1. *Cedusa nortoma*, new species
(Figs. 1-3)

Salient features. Length of male 4.9 mm, female 5.0 mm. Ground color of head and thorax light tawny; face with irregularly developed x-shaped brown marking at juncture of frons and clypeus, areas below ocelli embrowned, sides of clypeus slightly flared in basal half, hind margin of crown variably embrowned at middle; pronotum darkened at middle of anterior margin and behind each eye; mesonotum, except for pale lines on each side of carinate midline and pale posterior margins excluding distal angle, honey brown; legs pale, variably ringed with brown, tarsi often darkened; forewings with ground color ivory-white, veins largely or entirely pale, cells variably embrowned producing maculate effect.

Male genitalia. Right paramere in ventral view (Fig. 3) appearing capitate due to subquadrate constriction on inner margin just beyond middle, apical hook slender and tapered to sharp tip. Aedeagus in left lateral view (Fig. 1) with two moderately long, apically acute processes on flagellum, dorsal portion of flagellar mass prolonged as pointed tooth nearly reaching base of shaft, process from base of flagellum broadly subquadrate distally, with pointed tooth on ventral margin, basoventral angle of shaft produced as acute angulation. Aedeagus in right lateral view (Fig. 2) with three apically acute processes, lowest one arising near apex of shaft, middle one shortest and arising as ventral extension of subtriangular basal portion of flagellum, distal-most portion of flagellar mass with two comparatively broad processes, each terminating with pointed tooth, both originating from common base.

Types. Holotype male (USNM Collection), Chiriqui, Boquete, Panama, 7 December 1975, Coll. H. Wolda. Paratype male with same data but collected 16 October 1976. Paratype female with same data but collected 2 October 1975.

Specimens studied. Known only from types.



Figs. 1-7. Male genitalia. 1-3, *C. nortoma*, holotype. 4-6, *C. impada*, holotype. 1, 4, aedeagus in left lateral view. 2, 5, aedeagus in right lateral view. 3, 7, right paramere in ventral view. 6, left paramere in ventral view.

Notes. *C. nortoma* is one of several species that share maculate forewings. The aedeagus is most similar to that of *C. febori*, n. sp., but the shapes of the parameres are greatly different. Compare Fig. 3 and Fig. 23. The shape of the paramere alone will distinguish *C. nortoma* from all of its congeners with maculate forewings.

2. *Cedusa impada*, new species
(Figs. 4-7)

Salient features. Length of male 5.75 to 6.00 mm, female 6.4 mm. Ground color of head and thorax dull creamy white; face with irregularly developed x-shaped brown marking at juncture of frons and clypeus, upper arms of x-shaped brown marking joined by additional

brown areas near lateral margins on upper portion of frons; areas around ocelli, basal portions of second antennal segments, and portions of clypeus before apex, embrowned; sides of clypeus slightly flared in basal half; crown embrowned on midline, embrowned midline may join markings on frons; pronotum embrowned behind each eye; mesonotum, except for pale stripe on either side of carinate midline and pale posterior margin, amber to dark brown; legs pale, variably ringed with brown, tarsi often darkened; forewings with ground color white, veins largely pale, cells heavily embrowned producing dark maculate effect.

Male genitalia. Parameres in ventral view (Figs. 6-7) strongly asymmetrical at their apices, apical hook of left style long and stout, apical hook of right style triangular and much shorter. Aedeagus in left lateral view (Fig. 4) highly complex, with four slender processes arising near apex of shaft, third one of these longest and curved dorsally at its midlength; additionally, sharply triangular process arising near middle of distal portion of shaft; long, dorsally curved process arising near base of shaft and directed distally; broad process astride basal half of shaft, its ventral margin triangular, its dorsal margin narrowed to produce distally directed hook. Aedeagus in right lateral view (Fig. 5) with upright process originating near ventral margin of shaft in distal half, flagellar apex terminating with slender, moderately long, up-turned process.

Types. Holotype male (USNM Collection), Chiriqui, Guadalupe Arriba, Panama, 2100 m, 14-20 December 1983, Coll. H. Wolda. Paratype male and female with same data.

Specimens studied. Known only from types.

Notes. *C. impada* is one of several Neotropical species with maculate forewings. The aedeagus does not closely resemble that of any other species in the genus. The form and strongly asymmetrical development of the apical portions of the parameres and the conspicuous but slender aedeagal process that is upturned on the dorsal margin near the middle provide the most obvious features for recognition of this species.

3. *Cedusa marlota*, new species (Figs. 8-10)

Salient features. Length of male 3.8-4.0 mm, female 4.0-4.1 mm. Ground color of head and thorax dull creamy white to pale tawny; face, head, pronotum, and legs marked as in *impada*; mesonotum darkened on either side of pale carinate midline and along anterior margin, additional irregular dark markings on each side of midline near posterior margin of mesonotum; forewings with ground color ivory or white, veins pale, many cells embrowned producing maculate effect, cell embrowning heavier on distal portions of forewings than on proximal portions.

Male genitalia. Right paramere in ventral view (Fig. 10) with large triangular projection at apex of inner margin, inner margin mildly convex near middle. Aedeagus in left lateral view (Fig. 8) at apex with posteriorly directed hook and long slender needlelike process obliquely directed cephalad, both hook and process share origin from common base, flagellum with lateral tooth, process from below flagellum very broad, rounded on ventral margin, irregularly tapered on distodorsal margin to form slender extension. Aedeagus in right lateral view (Fig. 9) at apex with oval process bearing two lateral projections and sharp slender distal extension; flagellum apically acute, avicephaliform process from below flagellum partly overlaps ventral flagellar margin.

Types. Holotype male (USNM Collection), Mojinga Swamp, Canal Zone, Panama, 23 July 1952, F.S. Blanton coll. Paratype male and female with same data but collected 26 November 1951 and 20 November 1951. Second paratype female with same data but collected 26 November 1951, near Fort Sherman.

Specimens studied. Known only from types.

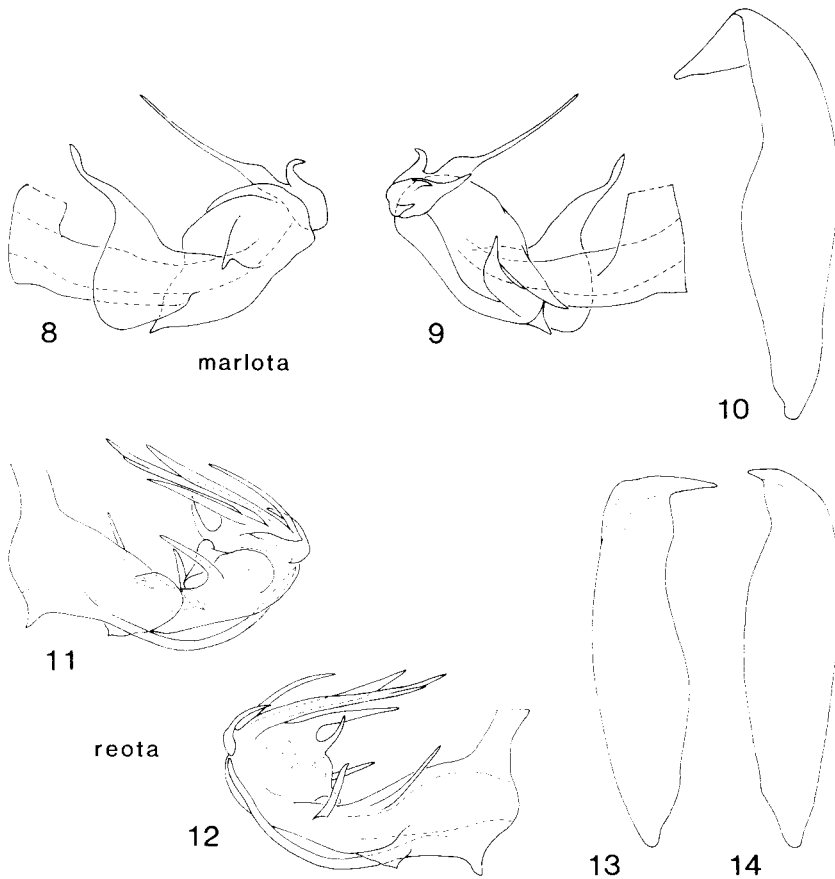
Notes. *C. marlota*, a maculate-forewinged species from Panama, can be readily distinguished by features of the aedeagus. The curved hook and long needlelike process at the aedeagal apex and the large ventrally rounded process that is tapered and extended on its dorsodistal margin provide the unique features of this species.

4. *Cedusa reota*, new species (Figs. 11-14)

Salient features. Length of male 4.8 mm, female 5.2 mm. Ground color of head and thorax ivory to light brown; head, pronotum, and legs marked as in *impada*; mesonotum entirely embrowned except for three pale longitudinal stripes on discal portion and pale posterior margin; forewings with ground color whitish hyaline, veins pale, and maculate with brown as in *marlota*.

Male genitalia. Parameres in ventral view (Figs. 13-14) asymmetrical, hook at apex of left paramere much longer than corresponding hook on right paramere, inner margins of parameres dissimilar. Aedeagus in left lateral view (Fig. 11) with four long and two shorter processes at apex; three additional shorter processes projecting above dorsal margin on shaft; ventrobasal angle of shaft acutely produced; with long, gradually upcurved process originating in basal half of shaft and directed distally to near apex of shaft. Aedeagus in right lateral view (Fig. 12) with two of three shorter processes extending above dorsal margin of shaft originating on this side.

Types. Holotype male (USNM Collection), Chiriqui, Fortuna, Panama, 1050 m, 16 February 1979, Henk Wolda. Allotype female with same data but collected 20 May 1979.



Figs. 8-14. Male genitalia. 8-10, *C. marlota*, holotype. 11-14, *C. reota*, holotype. 8, 11, aedeagus in left lateral view. 9, 12, aedeagus in right lateral view. 10, 14, right paramere in ventral view. 13, left paramere in ventral view.

Specimens studied. Known only from types.

Notes. *C. reota*, a Panamanian species with maculate forewings, can be distinguished from similar congeners by the cluster of long and slender processes at the apex of the aedeagal shaft and by the long process on the ventral margin of the aedeagal shaft.

5. *Cedusa dilbata*, new species
(Figs. 15-17)

Salient features. Length of male 3.9 mm, female 4.3 mm. Ground color of head and pronotum pale tawny, their markings and form essentially like those of *nortoma*; mesonotum with carinate midline pale, flanked by tangent dark line on each side, rest of mesonotum

variably embrowned; legs and forewings like those described for *nortoma*.

Male genitalia. Right paramere in ventral view (Fig. 17) with conspicuous projection at apex of inner margin, paramere widest near middle. Aedeagus in left lateral view (Fig. 15) at apex with three slender processes of different lengths, below these, three irregular lobes, ventral-most lobe bearing angulation, shaft stoutest at base, middle portion of shaft with irregular rounded structure. Aedeagus in right lateral view (Fig. 16) similar to left view but with large angularly recurved process directed distally on distal half of shaft; two additional short acute processes near base of flagellum and longer acute process on dorsal and distal margin of flagellum.

Types. Holotype male (USNM Collection), Las Cumbres, Panama, 17 September 1973, Coll. H. Wolda, at lights. Paratype male with same data but collected 26 December 1974.

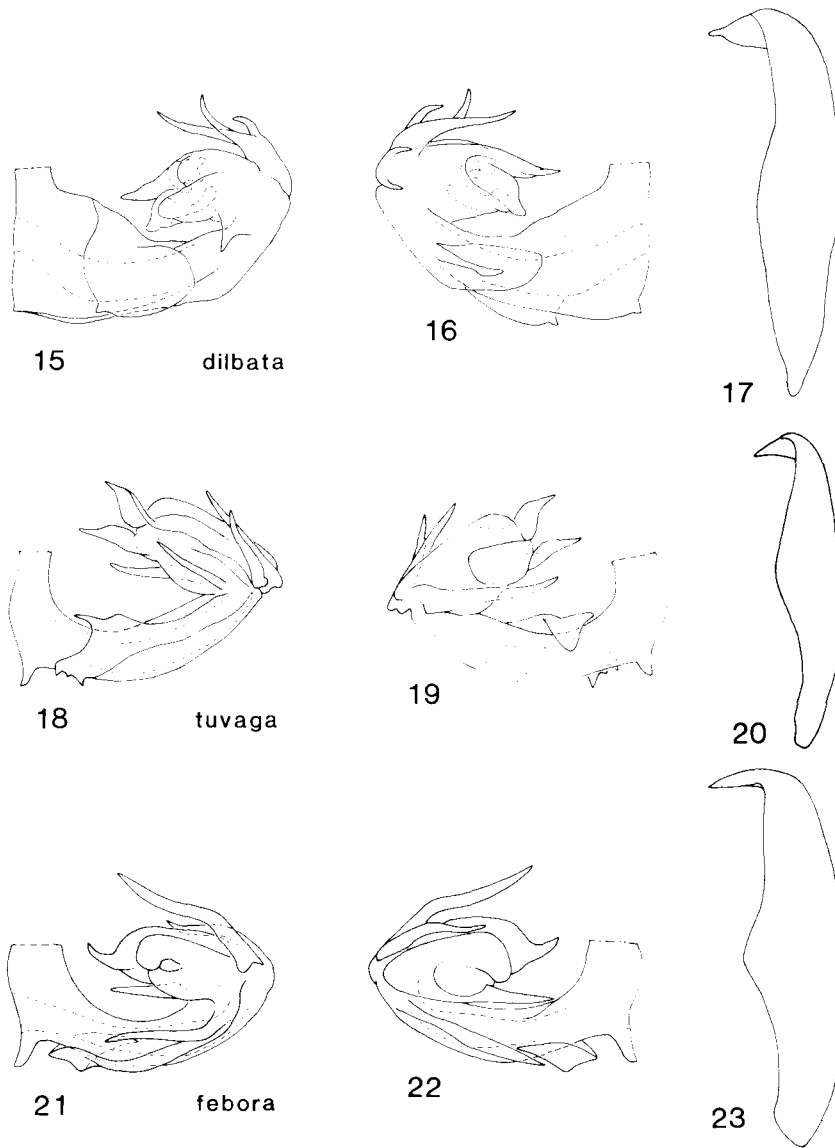
Specimens studied. In addition to the types, one female, apparently conspecific, from Barro Colorado Island, Canal Zone, 8 July 1975, Coll. H. Wolda.

Notes. *C. dilbata* can be separated from its congeners with maculate forewings by the broad basal area of the aedeagal shaft and the rather large, angularly recurved process that is directed distally on the right side of the aedeagal shaft.

6. *Cedusa tuvaga*, new species (Figs. 18-20)

Salient features. Length of male 3.8 mm, female 4.2 mm. Ground color of head and thorax pale tawny; face marked with pair of brown longitudinal stripes on frons, these stripes merge ventrally to form irregular x-shaped marking at juncture of frons and clypeus; sides of clypeus, areas around ocelli, central portion of crown, and portions of pronotum behind eyes, variably darkened; mesonotum with tangent dark brown stripe on each side of pale longitudinal midline, rest of mesonotum variably tinted with yellowish brown; legs and forewings like those of *marlota*.

Male genitalia. Right paramere in ventral view (Fig. 20) slender, broadest at middle, and inner apical margin with acute projection. Aedeagus in left lateral view (Fig. 18) at or near apex with three moderately long, slender processes directed cephalad; apex of flagellum terminating with two avicephaliform processes; shaft with long process originating near apex and directed cephalad, process subquadrate distally, its distal margin with one to three teeth, its dorsal margin surmounts shaft in saddlelike manner; basoventral angle of shaft produced. Aedeagus in right lateral view (Fig. 19) similar



Figs. 15-23. Male genitalia. 15-17, *C. dilbata*, holotype. 18-20, *C. tuvaga*, holotype. 21-23, *C. febora*, holotype. 15, 18, 21, aedeagus in left lateral view. 16, 19, 22, aedeagus in right lateral view. 17, 20, 23, right paramere in ventral view.

to left lateral view but with additional long slender process originating near juncture of shaft and flagellum and directed cephalad.

Types. Holotype male (USNM Collection), Pan de Azucar, Panama Province, Panama, 10 October 1952, Coll. F.S. Blanton. Paratype male and female, Las Cumbres, Panama, 29 June 1975, Coll. H. Wolda; second paratype male with same data but collected 14 September 1974.

Specimens studied. Known only from types.

Notes. *C. tuvaga*, one of several species with maculate forewings known from Panama, can be distinguished from other members of the genus by the pair of avicephaliform processes at the apex of the aedeagal flagellum and the long and distally enlarged process on the left side of the shaft.

7. *Cedusa feboru*, new species
(Figs. 21-23)

Salient features. Length of male 3.8-4.1 mm, female 4.0-4.3 mm. Ground color of head and thorax pale tawny; face marked with light brown, irregular, x-shaped marking at juncture of frons and clypeus, at times with additional vague embrowning on frons; areas below ocelli and central portion of crown embrowned; sides of clypeus with variably distinct, brownish transverse band; pronotum variably darkened behind eyes; mesonotum, in well-marked specimens, largely dark honey brown, with pair of pale longitudinal stripes and pale margins on posterior angle, central longitudinal carina of mesonotum distinct; legs pale, variably ringed with brown; forewings with ground color white or ivory, veins largely pale, cells embrowned producing maculate effect.

Male genitalia. Right paramere in ventral view (Fig. 23) with inner apical margin produced as slender, straight hook; convexity near midlength of inner margin. Aedeagus in left lateral view (Fig. 21) at apex with two processes of unequal length directed cephalad; flagellum terminating with slightly upturned process, acute process originating near ventral margin of flagellum directed cephalad; large rounded process on side of flagellum partly open distally, near its base long and slender process directed cephalad; ventral-most process of aedeagus longer than flagellum, subtriangularly enlarged apically, its apical portion bent around ventral margin of shaft and visible on right side of aedeagus; heel of shaft strongly produced. Aedeagus in right lateral view (Fig. 22) similar to left lateral view but with additional moderately long, apically acute process originating near base of flagellum and directed cephalad.

Types. Holotype male (USNM Collection), Palm Beach near San Carlos, Panama, 7 October 1952, Coll. F.S. Blanton. Paratype males (all from Panama and collected by F.S. Blanton): one, same data as holotype; two, Espino, 18 September 1952; one, Pto. Mensabe, Los Santos Prov., 22 October 1952; one, Las Lajas near Coronado Beach, 17 September 1952; and one, Palm Beach near San Carlos, 7 October 1952.

Specimens studied. In addition to the holo- and paratypes (all from Panama and collected by F.S. Blanton): male and female, Rio Lajas near Coronado Beach, 19 October 1952; female, Espino, 18 September 1952; female Las Lajos, 26 October 1952; male, Mojinga Swamp near

Fort Sherman, 28 August 1951; and one male, Rio Lajas near Coronado Beach, 19 September 1952.

Notes. *C. febora*, a Panamanian species, can be distinguished from all of its congeners by a combination of characters; these include the maculate forewings, the slightly upturned process at the apex of the flagellum, the long process that originates on the left side of the aedeagus and distally bends around the ventral margin of the shaft to appear on the right side, and the strongly produced heel at the basoventral angle of the shaft.

8. *Cedusa edox*, new species
(Figs. 24-26)

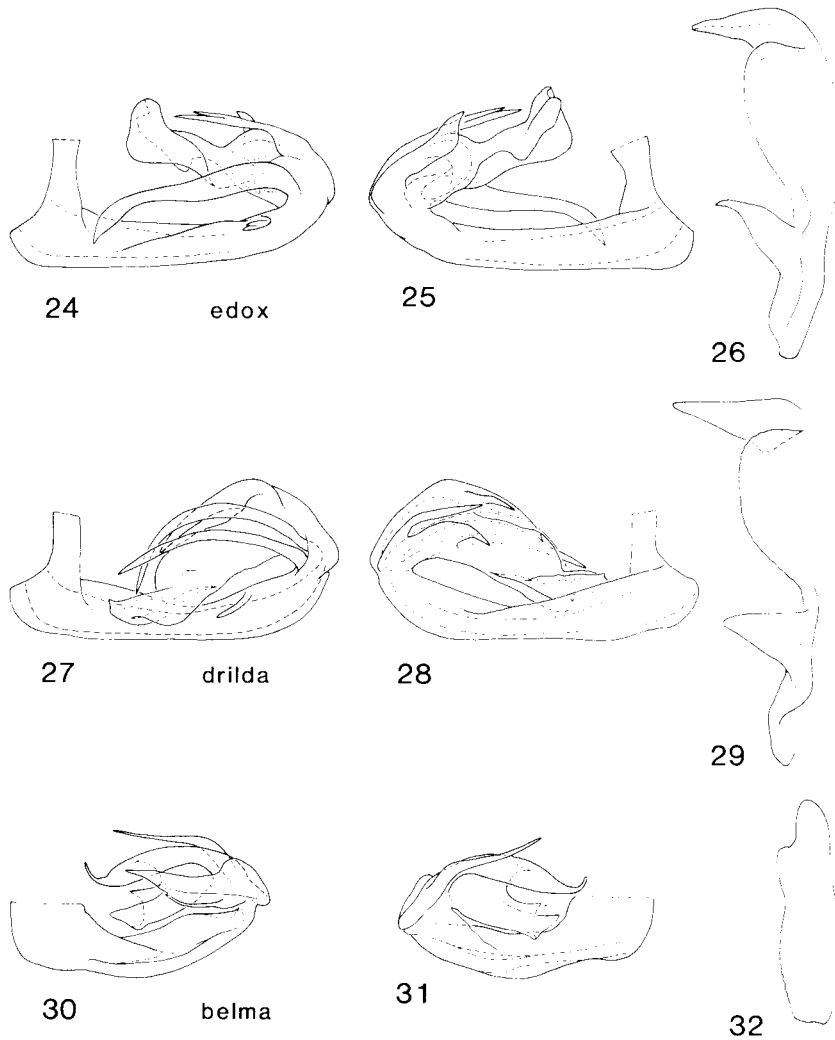
Salient features. Length of male 3.6 mm, female unknown. Ground color of head, pronotum, and legs tan to whitish tan; frons and clypeus marked with pair of longitudinal dark brown lines or stripes, color of these somewhat evanescent near fronto-clypeal suture; areas around ocelli, ventral portions of second antennal segments, all of crown except lateral margins, and portions of pronotum behind each eye, embrowned; mesonotum with ground color dark amber brown, bearing three pale longitudinal lines or stripes on discal portion, central line or stripe on carinate mesonotal midline; forewings hyaline tinted with pale amber brown, some cells lightly embrowned, veins largely pale.

Male genitalia. Right paramere in ventral view (Fig. 26) with inner apical margin produced as stout, acute, projection; second and avicephaliform projection on inner margin in basal half. Aedeagus in left lateral view (Fig. 24) at apex with two slightly unequal, moderately long, closely appressed processes; flagellum irregular in outline and expanded apically; near base of flagellum moderately stout, long process directed cephalad and slightly decurved distally; below and on or near dorsal margin of shaft small, shallowly forked process. Aedeagus in right lateral view (Fig. 25) similar to left lateral view but with additional moderately stout process arising near base of flagellum and directed cephalad.

Types. Holotype male (USNM Collection), Barro Colorado Island, Canal Zone, Panama, 24 May 1980, Coll. H. Wolda. Paratype male, Bocas d. T., Miramar, Panama, 9N: 82, 15W, 18 November 1978, Coll. H. Wolda.

Specimens studied. Known only from types.

Notes. *C. edox* is most similar to another described Panamanian species, *C. blantoni* Flynn and Kramer (1983:222, fig. 68) and to *C. drilda* n. sp. (Figs. 27-29) from Guatemala. All share similarly shaped parameres that are distinctive within the genus because of the large and prominent projections found on the inner margins in the basal halves. *C. edox* can be separated from *C. drilda* by the features used in couplet



Figs. 24-32. Male genitalia. 24-26, *C. edox*, holotype. 27-29, *C. drilda*, holotype. 30-32, *C. belma*, holotype. 24, 27, 30, aedeagus in left lateral view. 25, 28, 31, aedeagus in right lateral view. 26, 29, 32, right paramere in ventral view.

9 and from *C. blantoni* by the shape and surface modification of the longest aedeagal process as seen in left lateral views; compare Fig. 24 and Flynn and Kramer 1983:222, fig. 68a.

9. *Cedusa drilda*, new species
(Figs. 27-29)

Salient features. Length of male 3.6 mm, female unknown. External features not separable from those described for *C. edox*.

Male genitalia. Right paramere in ventral view (Fig. 29) like that of

C. edox except for triangularly shaped projection on inner margin in basal half. Aedeagus in left lateral view (Fig. 27) at apex with two subequal, long, clearly separated processes arising near or at juncture of flagellum and shaft on inner margin; flagellum inflated with large irregular lobe on ventral margin at apex; and short, slender process arising near dorsal margin on distal half of shaft. Aedeagus in right lateral view (Fig. 28) with flagellum inflated bearing three unequal processes, dorsal-most process short and slender, middle process moderately long and slender, ventral-most process stout and decurved distally, these two processes at least in part sharing a common base, and fourth process projecting on dorsal margin near apex. All processes essentially directed cephalad.

Type. Holotype male (USNM Collection), Departamento Escuintla, Guatemala, 500-1000 ft., April-May 1950, Coll. Brennan.

Specimens studied. Known only from holotype.

Notes. *C. drilda* belongs to a group of three Central American species within *Cedusa* that share similarly shaped parameres. See notes under *C. edox*.

10. *Cedusa belma*, new species
(Figs. 30-32)

Salient features. Length of male 3.3-3.4 mm, female 3.5-3.7 mm. Ground color of head and thorax yellow-orange to pale orange and unmarked; apical segment of labium darkened; forewings sordid stramineous to whitish, veins about same color as mesonotum.

Male genitalia. Right paramere in ventral view (Fig. 32) blunt apically and with broad and blunt subapical expansion on inner margin. Aedeagus in left lateral view (Fig. 30) at apex with three long processes; dorsal-most process drawn out and needlelike distally; middle process stouter, decurved near base, and abruptly narrowed to form upturned needlelike apex; ventral-most process stout, straight, and tapered distally to form acute and sharp apex. Aedeagus in right lateral view (Fig. 31) similar to left lateral view with flagellum troughlike and open distally. All processes essentially directed cephalad.

Types. Holotype male (USNM Collection) and allotype female, Mojinga Swamp, Station 4, nr. Fort Sherman, Canal Zone, Panama, 28 August 1951, light trap, Coll. F.S. Blanton. Paratypes: male and three females with same data; six males with same data but without date and Station 4.

Specimens studied. In addition to the above listed types, six males and 14 females from Mojinga Swamp, Panama collected by F.S. Blanton in months of January, June, July, August, November, and December; two males and female from Barro Colorado Island, Panama collected by H. Wolda in July and August.

Notes. *C. belma*, known only from Panama, is readily distinguished from all of its congeners by the yellow-orange to pale orange head and thorax, pale forewings, and its uniquely shaped parameres that lack any trace of a projection on their inner apical margins.

11. *Cedusa gonuga*, new species
(Figs. 33-35)

Salient features. Length of male 3.6 mm, female 4.2 mm. Ground color of head and thorax pale stramineous, face shade darker with apex of clypeus, central portions of frons and crown embrowned; pronotum and mesonotum uniformly pale; forewings nearly hyaline and colorless, veins pale, indefinite brownish clouding near claval apices and on stigmal areas.

Male genitalia. Right paramere in ventral view (Fig. 35) with outer margin semicircular, inner margin convex near middle and bearing microsetae, apical portion gradually narrowed and turning inward. Aedeagus in left lateral view (Fig. 33) at apex with two moderately long processes, upper one uniformly slender, lower one stouter but drawn out and needlelike at distal dorsal margin; flagellum preapically modified with partly fused processes, terminating with moderately broad, slightly upturned distal portion. Aedeagus in right lateral view (Fig. 34) similar to left lateral view but with additional process arising near flagellar base, process enlarged at base and apex, its distal dorsal margin drawn out and needlelike.

Types. Holotype male (USNM Collection), Bocas d. T., Corriente Grande, Panama, 100 m, 27 November 1980, Coll. Henk Wolda. Allotype female with same data but collected 2 April 1980.

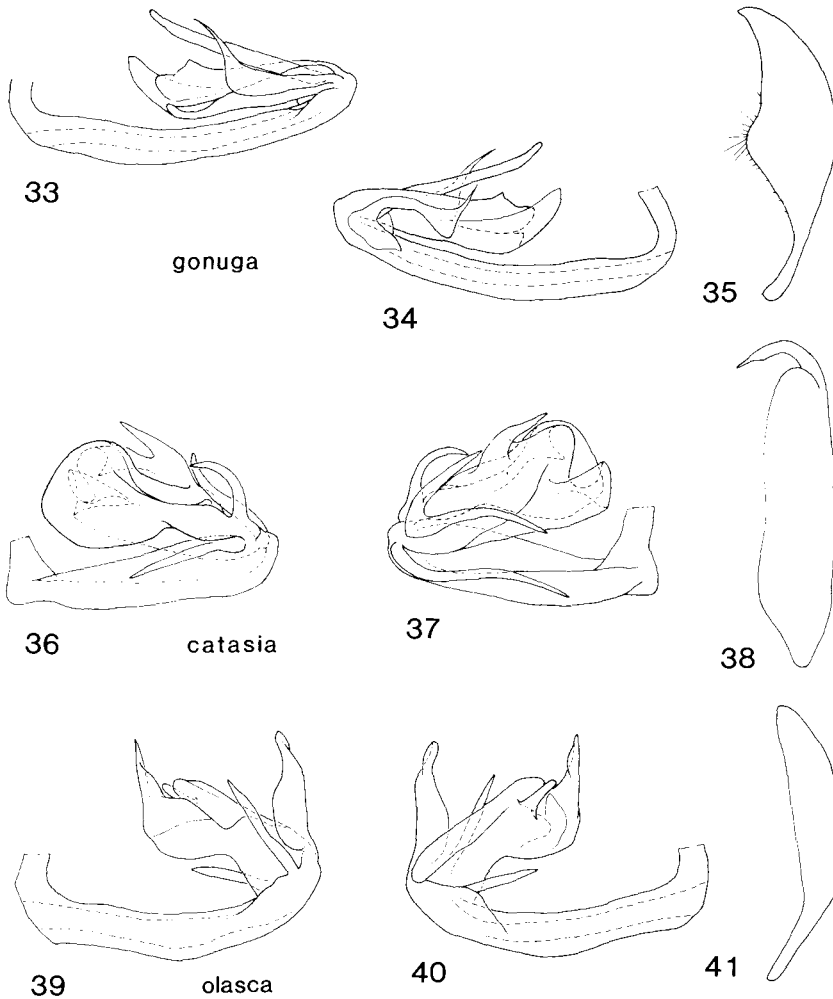
Specimens studied. Known only from types.

Notes. *C. gonuga*, a species known only from Panama, is readily distinguished from all of its congeners by its pale coloration, subhyaline forewings that have some vague and light embrowning distally, and the semicircular outer margins of the parameres.

12. *Cedusa catasia*, new species
(Figs. 36-38)

Salient features. Length of male 4.25 mm, female unknown. Ground color of head and thorax light tawny and without markings; face, thoracic venter, and legs shade darker; forewings and veins whitish and vaguely tinted with pale tawny, some vague embrowning on cells bordering costal margins.

Male genitalia. Right paramere in ventral view (Fig. 38) moderately stout, apical portion produced as slender inturned hook. Aedeagus in



Figs. 33-41. Male genitalia. 33-35, *C. gonuga*, holotype. 36-38, *C. catasia*, holotype. 39-41, *C. olasca*, holotype. 33, 36, 39, aedeagus in left lateral view. 34, 37, 40, aedeagus in right lateral view. 35, 38, 41, right paramere in ventral view.

left lateral view (Fig. 36) near apex with upright process that turns cephalad near its midlength, below it another process directed cephalad; flagellum distally expanded and irregularly rounded, its dorsal margin with tapered process arising from broad base. Aedeagus in right lateral view (Fig. 37) similar to left lateral view but with pair of moderately long processes arising near base of flagellum, these processes fused basally, below them another slightly longer process; all processes directed cephalad.

Type. Holotype male (USNM Collection), Mojinga Swamp, Panama, 4 October 1951, Coll. F.S. Blanton.

Specimens studied. Known only from holotype.

Notes. The Panamanian *C. catasia* can be separated from all of its congeners by its overall pale coloration, the slender hooks at the apices of the parameres, and the distally expanded and irregularly rounded flagellum.

13. *Cedusa olasca*, new species
(Figs. 39-41)

Salient features. Length of male 4.4 mm, female 5.5 mm. Ground color of head, pronotum, and legs tawny; central portions of frons and clypeus, areas around ocelli and below antennal ledges, portions of pronotum behind eyes, and thoracic sides and venter, variably embrowned; legs unmarked; mesonotum largely deep amber brown, in female with very faint pale longitudinal line or stripe on each side of longitudinal midline, hind margin of mesonotum narrowly pale. Forewings with ground color ivory or whitish, some cells embrowned producing maculate effect, apical margins of forewings very slightly and narrowly tinted with reddish.

Male genitalia. Right paramere in ventral view (Fig. 41) unusually simple, basal portion stalked, apical portion broadly tapered to blunt tip, without any trace of apical hook. Aedeagus in left lateral view (Fig. 39) with two upright processes near apex, apical-most of these stouter and blunter than other; flagellar apex with moderately stout, apically pointed process; all processes essentially directed dorsally. Aedeagus in right lateral view (Fig. 40) similar to left lateral view but with straight and distally pointed process arising at juncture of flagellum and shaft; and straight, rather short, blunt process arising subapically near middle of flagellum.

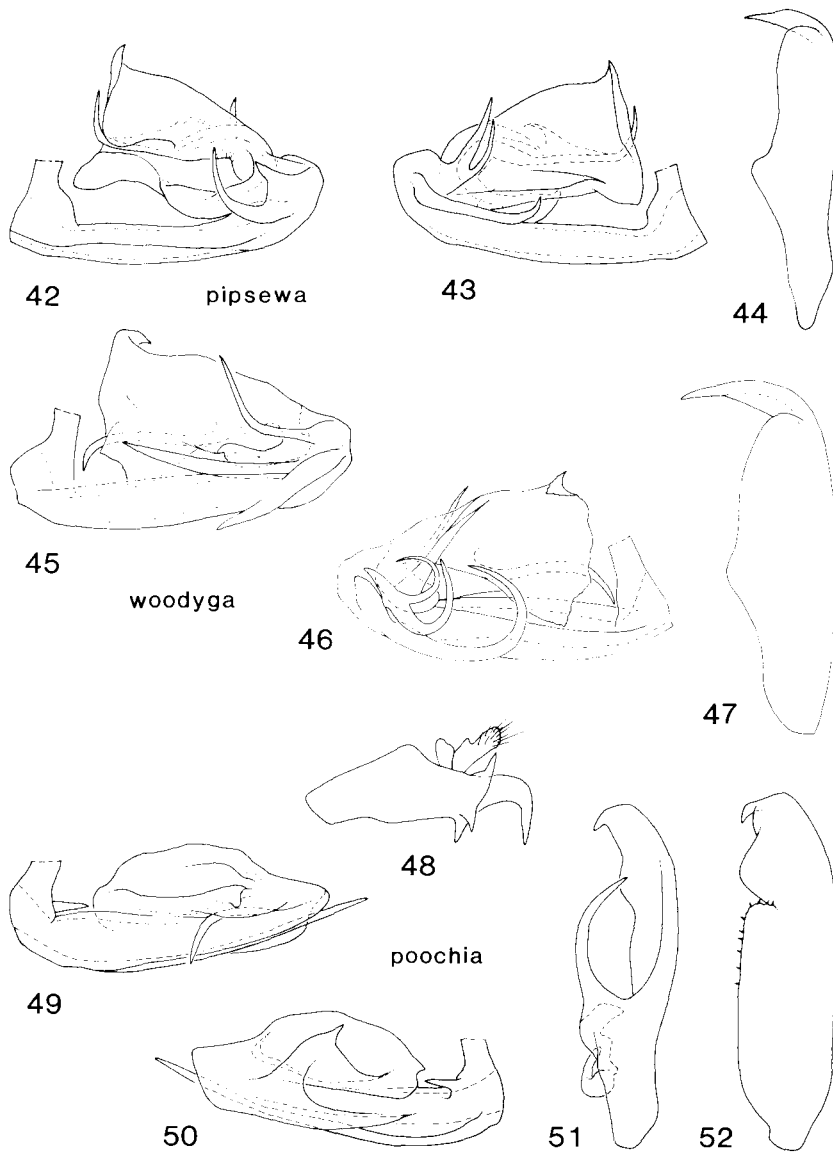
Types. Holotype male (USNM Collection), Chiriqui, Boquete, Panama, 1250 m, 10 August 1975, Coll. H. Wolda. Allotype female, Chiriqui, Volcan., Panama, 1200 m, 1 October 1975, Colls. Wolda and Estribi.

Specimens studied. Known only from types.

Notes. *C. olasca*, known only from Panama, can be readily distinguished by its maculate forewings, dark mesonotum, unmarked legs, and simple parameres.

14. *Cedusa pipsewa*, new species
(Figs. 42-44)

Salient features. Length of male 5.5 mm, female 5.9 mm. Ground color of head and thorax amber brown; antennae, subantennal ledges, lateral portions of pronotum, tegulae, and hind legs, ivory to bright white; mesonotum dark amber; forewings white tinted with dark brown or brownish along costal margins to stigmal areas and along anal margins to claval apices; apical cells of forewings variably tinted with brown.



Figs. 42-52. Male genitalia. 42-44, *C. pipsewa*, holotype. 45-47, *C. woodyga*, holotype. 48-52, *C. poochia*, holotype. 42, 45, 49, aedeagus in left lateral view. 43, 46, 50, aedeagus in right lateral view. 44, 47, 52, right paramere in ventral view. 48, anal tube in left lateral view. 51, right paramere in dorsal view.

Male genitalia. Right paramere in ventral view (Fig. 44) with distinct convexity on inner margin near midlength; apical portion tapered to sharply acute, mesally directed hook. Aedeagus in left lateral view (Fig. 42) with process near apex of shaft, process slender and upturned distally and bearing subtriangular projection on its dorsal margin; flagellum large, broadest distally, with ventral folds, slender and upturned process projecting near middle of distal margin. Aedeagus in right lateral view (Fig. 43) with two processes near apex of shaft, upper process deeply forked distally, lower process slender and gradually upturned distally to sharp apex; flagellum funnel-shaped with sharp angulation just above ventral margin.

Types. Holotype male (USNM Collection) and allotype female, Chiriqui, Guadalupe Arriba, Pannama, 2100 m, 29 February - 6 March 1984, Coll. H. Wolda. One paratype male with identical data.

Specimens studied. Known only from types.

Notes. *C. pipsewa* is notable for its strongly bicolored brown and white forewings, its length, and its funnel-shaped flagellum. It is closely related to *C. woodyga*, also known from Panama only. The two species are readily separated by the characters used in couplet 15 of the key to species.

15. *Cedusa woodyga*, new species
(Figs. 45-47)

Salient features. Length of male 4 mm, female 4.5 mm. Ground color of head tawny orange, pronotum paler, mesonotum dark amber brown, tegulae ivory, all legs light brown, forewings largely white with costal margins partly and claval apices lightly embrowned.

Male genitalia. Right paramere in ventral view (Fig. 47) with distinct convexity near middle of inner margin, large tapered hook at apex directed inward. Aedeagus in left lateral view (Fig. 45) at apex with three long, tapered, distally acute processes; uppermost process most slender and gradually upturned near its midlength; base of flagellum with shorter process, its apex bearing short hook; flagellum subtriangular, large, broadest distally, margins irregular, short hook at dorso-distal angle, slender and ventrally projecting process directed beyond distal margin. Aedeagus in right lateral view (Fig. 46) with two slender processes near apex of shaft, lower process longer and distally recurved, upper process shorter and with two recurved portion, flagellum with some folds in basal half.

Types. Holotype male (USNM Collection), Chiriqui, Fortuna, Panama, 1050 m, 6 June 1977, Coll. Henk Wolda. Allotype female with same data but collected 13 November 1976.

Specimens studied. Known only from types.

Notes. *C. woodyga* looks like a smaller and less well-marked or faded example of *C. pipsewa*. Both species are known only from Chiriqui, Panama, and can be separated by the features used in couplet 15 of the key to species.

16. *Cedusa poochia*, new species
(Figs. 48-52)

Salient features. Length of male 3.2 mm, female unknown. Ground color of head, thorax, and forewings dark coffee brown; legs sordid stramineous to pale brownish; distal crossveins at least in part white.

Male genitalia. Right paramere in ventral view (Fig. 52) moderately stout, sharp indentation on inner margin in distal half, apical margin blunt, inner apical edge produced as short hook. Right paramere in dorsal view (Fig. 51) with long lanceolate process originating in basal half, process directed distally and gradually curved laterad. Anal tube in left lateral view (Fig. 48) terminating with large ventrally directed hook, with two short and acute processes subapically on ventral margin and single process on dorsal subapex. Aedeagus in left lateral view (Fig. 49) with flagellum suboval, its dorsal margin irregular, laterally with folds and angulations; decurved, slender process originating near and partly concealed by flagellar base, process directed basad and gradually decurved distally; short and sharply acute process on inner margin of upturned basal portion of shaft. Aedeagus in right lateral view (Fig. 50) with angulation at apex and on side of flagellum; long, slender lanceolate process arising at extreme base of shaft, process directed distally under shaft and projecting beyond apex of shaft.

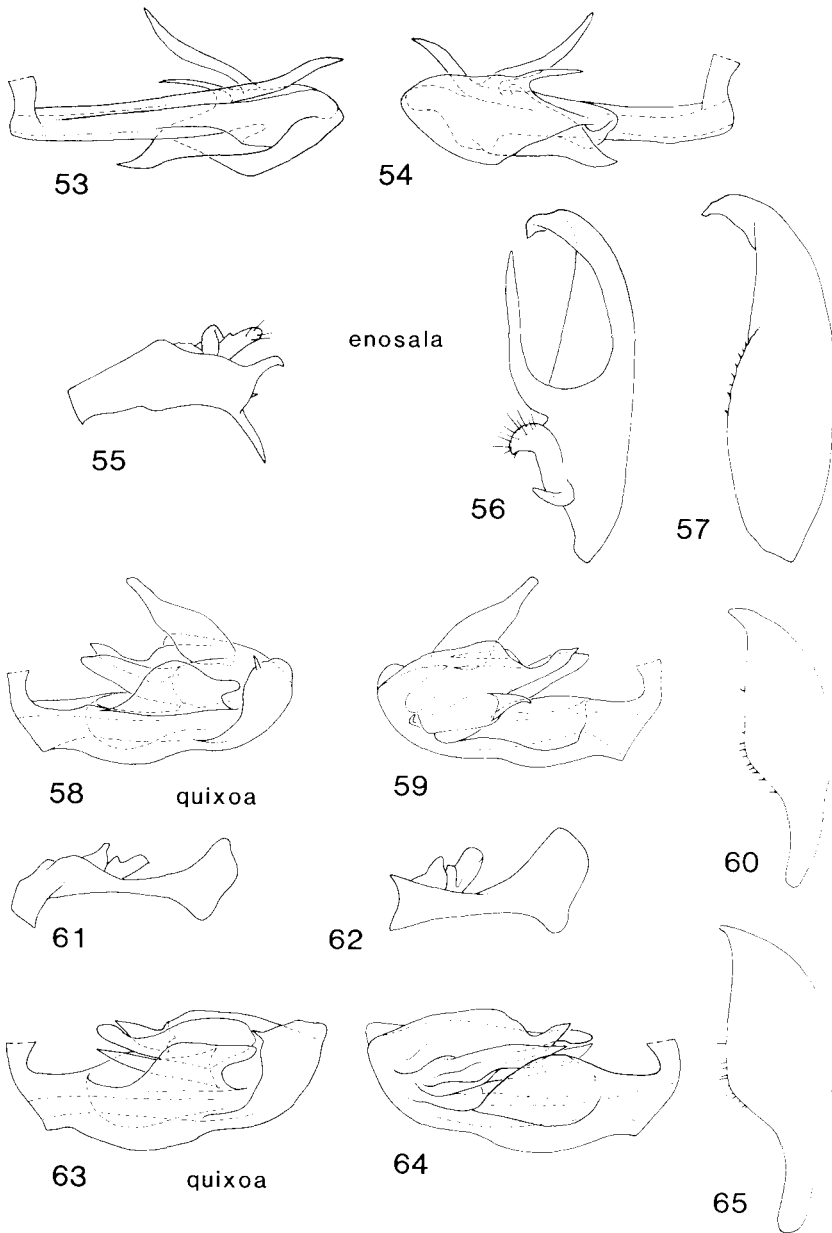
Type. Holotype male (USNM Collection), Finca La Selva near Pto. Viejo, Heredia Prov., Costa Rica, 17-19 March 1973, D.C. Rentz.

Specimens studied. Known only from type.

Notes. *C. poochia* belongs to a group of four Central American species that bear a long lanceolate process on the dorsal inner margin of the right paramere. *C. poochia* closely resembles both *C. digitata* Caldwell (Flynn and Kramer 1983: 163, fig. 22) and *C. neodigitata* Caldwell (Flynn and Kramer 1983: 163, fig. 23). It can be separated from both of these species, as well as from *C. enosala* n. sp., by the long lanceolate basal aedeagal process that clearly exceeds the total length of the shaft. None of the other species in this group have a process of this nature.

17. *Cedusa enosala*, new species
(Figs. 53-57)

Salient features. Length of male 3.8 mm, female unknown. Ground color of head, thorax, and forewings dark reddish brown; forewings, except for claval and corial areas, somewhat paler shade; some distal



Figs. 53-65. Male genitalia. 53-57, *C. enosala*, holotype. 58-61, *C. quixoa*, holotype. 62-65, *C. quixoa*, specimen from Costa Rica. 53, 58, 63, aedeagus in left lateral view. 54, 59, 64, aedeagus in right lateral view. 55, 61, 62, anal tube in left lateral view. 56, right paramere in dorsal view. 57, 60, 65, right paramere in ventral view.

crossveins white; legs largely stramineous to sordid stramineous and unmarked.

Male genitalia. Right paramere in ventral view (Fig. 57) with inner margin mildly convex in basal half; apical portion broadly turned inward and tapered to narrow apex. Right paramere in dorsal view (Fig. 56) with long lanceolate process projecting distally on inner margin. Anal tube in left lateral view (Fig. 55) with apical margin bearing unpaired projections at dorsal and ventral angles, between them minute tooth. Aedeagus in left lateral view (Fig. 53) with three rather long processes on or projecting above dorsal margin in distal half; basalmost process longest, projecting caudad, other two shorter processes projecting cephalad or obliquely cephalad. Aedeagus in right lateral view (Fig. 54) similar to left lateral view, with triangular projection below flagellar apex.

Types. Holotype male (USNM Collection), Mindi Dairy, Canal Zone, Panama, 3 December 1951, Coll. F.S. Blanton. Paratype male with same data but collected 17 December 1951. Paratype male Mandinga, Canal Zone, Panama, 28 March 1952, Coll. F.S. Blanton.

Specimens studied. Known only from types.

Notes. *C. enosala* belongs to a group of four Central American species that have a lanceolate process on their right paramere; see notes under *C. poochia*. *C. enosala* can be immediately separated from the other three species by the three processes that are found projecting above the dorsal margin of the shaft in its distal half. None of the other closely related species have processes so developed.

18. *Cedusa quixoa*, new species (Figs. 58-65)

Salient features. Length of male 4.5-4.9 mm, female 5.0-5.3 mm. Ground color of head and thorax light brown; face, crown, and legs slightly darker than pronotum; mesonotum amber brown; forewings light brown with some small inconspicuous white clouds, these most often found on distal crossveins; edges of forewings tinted with red from stigmatal areas around apices.

Male genitalia. Right paramere in ventral view (Figs. 60, 65) broadest near middle, stalked basally, outer margin semicircular, apical portion tapered to rather blunt inwardly directed apex. Anal tube in left lateral view (Figs. 61, 62) narrowest near middle, apical portion enlarged or expanded both dorsally and ventrally. Aedeagus in left lateral view (Figs. 58, 63) at apex with smooth tooth on apical projection; dorsal margin of shaft with large convexity, convexity with variable blunt projection on margin nearest apex of shaft; flagellum with three processes or divisions of similar shape, processes broadest in basal halves and narrowed distally, uppermost process rounded at apex, other two

processes more acute at apices. Aedeagus in right lateral view (Figs. 59, 64) similar to left lateral view but with additional process of variable length arising near base of flagellum and directed cephalad.

Types. Holotype male (USNM Collection), Chiriqui, Fortuna, Panama, 25 October 1976, Coll. Henk Wolda. Allotype female with same data but collected 31 May 1977.

Specimens studied. In addition to the types, male, Canal Zone, Panama, 30 January 1981, H. Wolda; female, eight miles north of Volcan, Panama, 6 December 1952, F.S. Blanton; female, Mojinga Swamp, Ft. Sherman, Panama, 28 August 1951, F.S. Blanton; and female, San Pedro de Montes de Oca, Costa Rica, 14 October 1936, H. Ballou.

Notes. The general light brown ground color, the red apical margins of the forewings, and the small white clouds found mainly on the crossveins of the forewings provide the distinguishing features of *C. quixoa*.

19. *Cedusa janola*, new species
(Figs. 66-72)

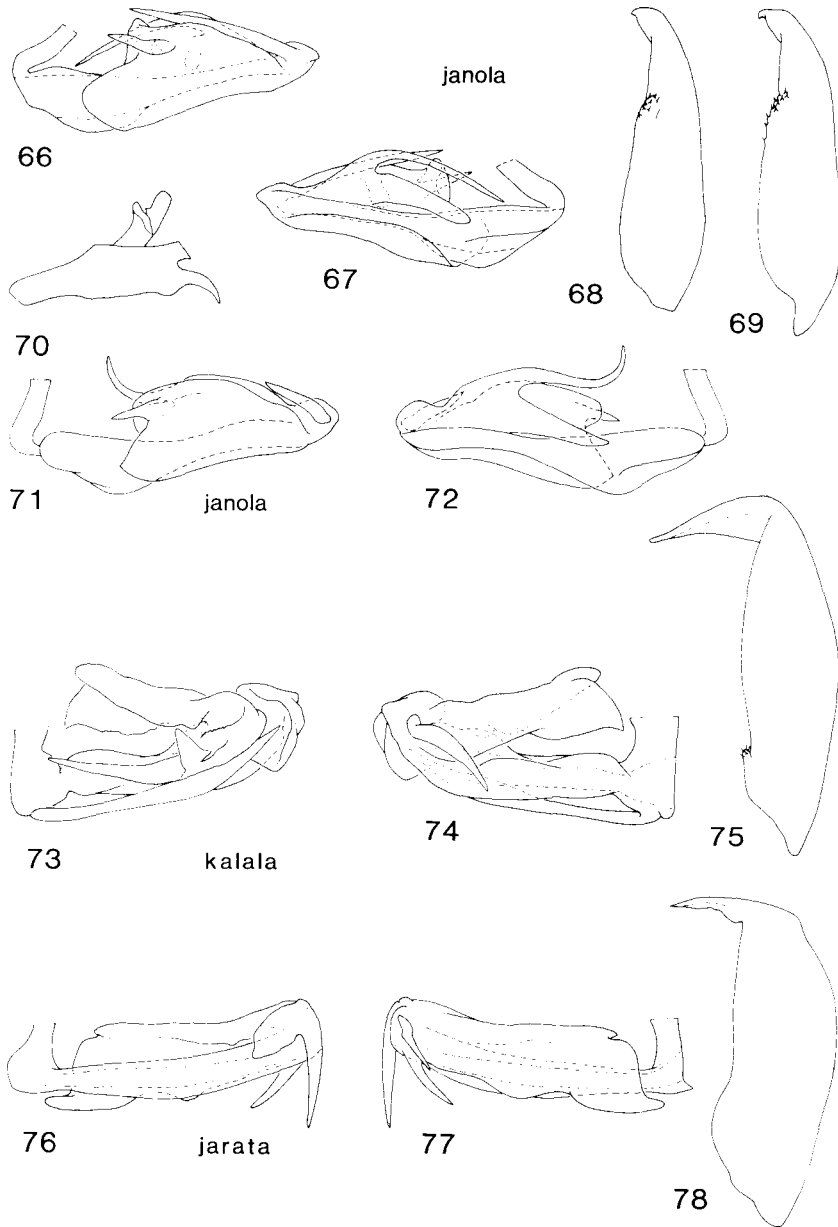
Salient features. Length of male 4.0 mm, female 4.25 mm. Color of head, thorax, and forewings fuscus; legs pale brown, without markings of any sort.

Male genitalia. Right paramere in ventral view (Figs. 68, 69) broadly and roundly convex on inner margin in proximal portion; distal portion narrowed to form minute hook at extreme apex of slightly inturned apical portion. Anal tube in left lateral view (Fig. 70) terminating with pair of processes; upper pair short, broad, and truncated; lower pair longer, slightly decurved, and acute apically. Aedeagus in left lateral view (Figs. 66, 71) with flagellum unusually large and concealing more than half of shaft; moderately short process beyond midlength on dorsal margin of flagellum; slender, acute process of variable length arising apically or slightly subapically on shaft; both processes directed cephalad or obliquely cephalad. Aedeagus in right lateral view (Figs. 67, 72) with structure on side of flagellum deeply forked distally; upper fork slender, tapered to narrow and acute apex; lower fork much stouter and fingerlike.

Types. Holotype male (USNM Collection), Bocas d. T., Corriente Grande, Panama, 100 m, 10 November 1980, Henk Wolda. Allotype female with identical data. Paratype male, three miles West of Turrialba, Costa Rica, 27 August 1972, G.F. and S. Hevel.

Specimens studied. Known only from types.

Notes. *C. janola* can be recognized by the unique paired processes at the apex of the anal tube and by the deeply forked structure on the right side of the flagellum.



Figs. 66-78. Male genitalia. **66-68, 70**, *C. janola*, holotype. **69, 71, 72**, *C. janola*, specimen from Costa Rica. **73-75**, *C. kalala*, holotype. **76-78**, *C. jarata*, holotype. **66, 71, 73, 76**, aedeagus in left lateral view. **67, 72, 74, 77**, aedeagus in right lateral view. **68, 69, 75, 78**, right paramere in ventral view. **70**, anal tube in left lateral view.

20. *Cedusa kalala*, new species
(Figs. 73-75)

Salient features. Length of male 3.5-4.0 mm, female 4.0 mm. Ground color of head, thorax, and forewings, fuscus; margins of clypeus, frons, crown, pronotum, anterior carina on crown, antennae, subantennal ledges, light yellow-brown; surface of clypeus and sides of head below antennal ledges, medium brown; central carina of clypeus and legs, dull yellow-orange to orange; mesonotum, tegulae, and forewings, uniformly dark.

Male genitalia. Right paramere in ventral view (Fig. 75) with small setose lobe on inner margin near base; unusually large inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 73) with two unusually long processes; each nearly as long as shaft; one arising near apex of shaft, with upright finlike projection on its side, its apex sharply acute and directed cephalad; one arising near base of shaft on ventral margin, its apex sharply acute and directed caudad; flagellum modified to straddle shaft, left portion of flagellum narrower than right portion. Aedeagus in right lateral view (Fig. 74) with moderately long, acute process arising near base of flagellum, its apex directed obliquely cephalad; flagellum asymmetrically cleft at apex, right portion of flagellum broader than left portion, its extreme apex acutely angular and slightly downcurved.

Types. Holotype male (USNM Collection), Bella Vista, Nayarit, Mexico, 7 May 1956, R. and K. Dreisbach. Paratype male and female with identical data.

Specimens studied. Known only from types.

Notes. *C. kalala* is unique in the genus on the basis of the long, asymmetrical, and distally cleft flagellum that straddles the dorsum of the shaft and the two long processes on the left side of the aedeagus that are nearly as long as the shaft itself.

21. *Cedusa jarata*, new species
(Figs. 76-78)

Salient features. Length of male 3.5 mm, female 3.9 mm. Coloration identical to that described for *C. kalala*.

Male genitalia. Right paramere in ventral view (Fig. 78) with round convexity on inner margin near base; slender, sharply acute, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 76) with basally lobed, moderately long, ventrally directed, acute process at apex; flagellum straddling shaft and nearly as long as it; dorsal margin of flagellum consisting of fused process; distoventral angle of flagellum produced as short, blunt, fingerlike projection. Aedeagus in

right lateral view (Fig. 77) similar to left lateral view but flagellum concealing all except base of shaft, and with two slender, slightly sub-apical processes on shaft; these directed obliquely ventrad or baso-ventrad.

Type. Holotype male (USNM Collection), Colima, Mexico, 19 October 1954, N.L.H. Krauss. Allotype female with same data except collection date October 1954.

Specimens studied. Known only from types.

Notes. *C. jarata* is unique in the genus on the basis of the long flagellum that straddles the dorsum of the shaft, the apical modification of the flagellum, and the three processes at or near the apex of the shaft that are essentially downturned.

22. *Cedusa youwza*, new species
(Figs. 79-81)

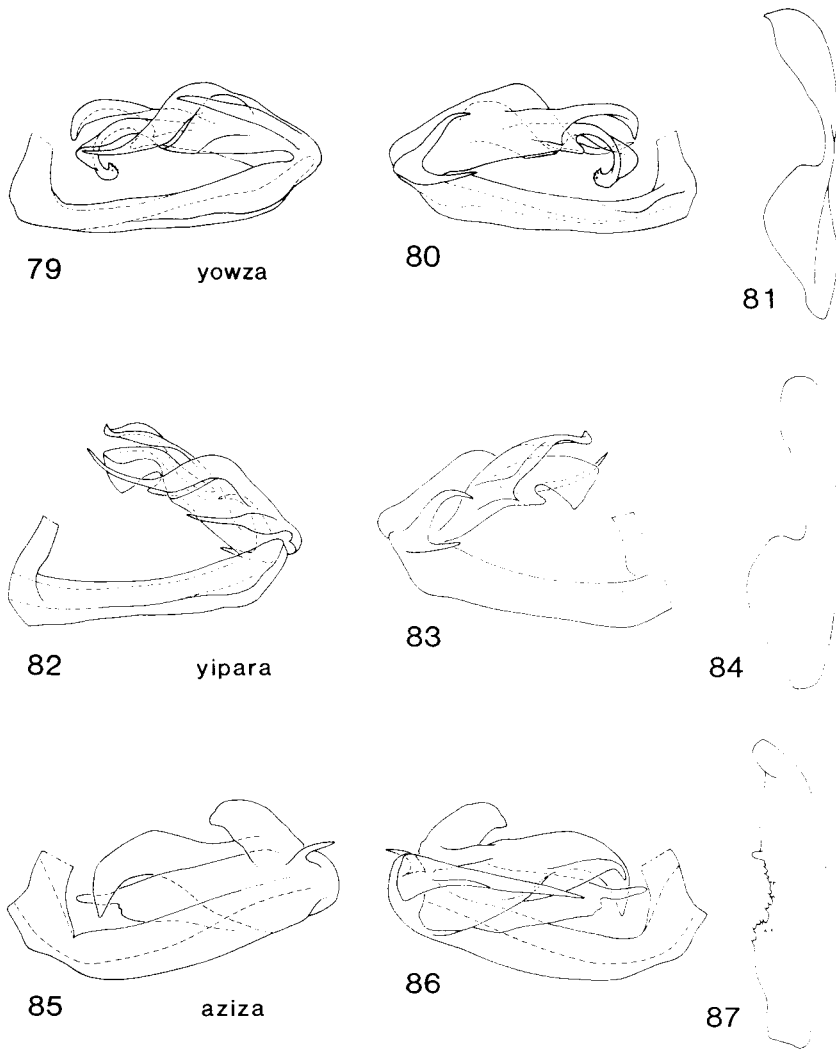
Salient features. Length of male 3.6 mm, female 3.7-3.9 mm. Ground color of head and thorax dark red-brown, subantennal ledges and at times carinate portions of head and pronotum vaguely paler; mesonotum uniformly dark; legs sordid stramineous; forewings uniformly tinted with red-brown; distal crossveins at least partly whitish.

Male genitalia. Right paramere in ventral view (Fig. 81) greatly narrowed near middle, broadest in basal half, distal half not tapered but with apical inner margin slightly produced. Aedeagus in left lateral view (Fig. 79) with moderately long process arising near base of flagellum and directed cephalad; flagellum tapered to slender, sloping apical portion and split near middle of ventral margin. Aedeagus in right lateral view (Fig. 80) with forked process arising at flagellar base, fork directed cephalad; flagellum with two processes; first process arising near middle of distal portion, process downturned apically and with angulation on its ventral margin near base; second process arising from within flagellum, process almost circularly downturned, with fin on distal margin before apex, extreme apex bearing microteeth.

Types. Holotype male (USNM Collection) and allotype female, La Jolla, Panama, 26 April 1951, F.S. Blanton. Paratype male and two paratype females with identical data.

Specimens studied. In addition to the types, male, Lina, Panama, 15 December 1952, F.S. Blanton.

Notes. *C. youwza*, a Panamanian species, can be distinguished by the greatly narrowed middle portion of the parameres and the unique shapes of the processes at the flagellar apex. It is closely related to *C. yipara* n. sp., a Brazilian species; the two species are readily separated by the characters presented in couplet 23 of the key to species.



Figs. 79-87. Male genitalia. 79-81, *C. yowza*, holotype. 82-84, *C. yipara*, holotype. 85-87, *C. aziza*, holotype. 79, 82, 85, aedeagus in left lateral view. 80, 83, 86, aedeagus in right lateral view. 81, 84, 87, right paramere in ventral view.

23. *Cedusa yipara*, new species
(Figs. 82-84)

Salient features. Length of male 3.9 mm, female 4.2 mm. Ground color of head and thorax dark red-brown to almost fuscus, antennae and subantennal ledges paler; mesonotum uniformly dark; legs stramineous to pale brown; forewings tinted with red-brown, distal crossveins paler.

Male genitalia. Right paramere in ventral view (Fig. 84) narrowest near middle, broadest in basal half, apex bluntly rounded without usual hook. Aedeagus in left lateral view (Fig. 82) like that of *C. youza* except process arising near base of flagellum shorter and oval basally, lower apical flagellar process not clearly differentiated from flagellum dorsally. Aedeagus in right lateral view (Fig. 83) like that of *C. youza* except process arising on side of flagellum elongate-oval and narrowing distally to form short upturned apex, ventral margin of process with angulation on proximal half; flagellum broadly truncated at apex and with angulation on ventral margin before apex.

Types. Holotype male (USNM Collection) and allotype female, Mongagua, San Paulo, Brazil, 24 August 1961, N.L.H. Krauss. Paratype male and female with identical data.

Specimens studied. Known only from types.

Notes. *C. yipara* is unique on the basis of the parameres' shapes and the modifications of the aedeagal flagellum. It is closely related to *C. youza* n. sp.; see notes under that species.

24. *Cedusa aziza*, new species (Figs. 85-87)

Salient features. Length of male 3.0 mm, female 3.4 mm. Ground color of head and thorax fuscus to almost black; lateral carina of frons and crown, antennae and antennal ledges, lateral edges of pronotum, and legs, brownish yellow; mesonotum uniformly dark; forewings in reflected light, nearly black.

Male genitalia. Right paramere in ventral view (Fig. 87) with broad, shallow concavity near middle of inner margin, concavity with variable number of irregular microteeth; apical portion of paramere blunt and slightly inturned, no suggestion of apical hook. Aedeagus in left lateral view (Fig. 85) at apex with short, slender, acute process directed caudad; upper portion of flagellum consisting of two large stout projections; distal projection shorter, its proximal edge at apex bluntly convex; proximal projection longer, broadly tapered to downturned apex; lower portion of flagellum elongated and stout, with blunt, fingerlike extension at middle of apical margin. Aedeagus in right lateral view (Fig. 86) similar to left lateral view but with long lanceolate process arising near apex and directed cephalad, ventral margin of process near middle with adpressed, short, similarly shaped process; flagellum with process arising from beneath proximal projection, this process moderately broad but tapered distally to downturned apex.

Types. Holotype male (USNM Collection), Veracruz, Mexico, November 1954, N.L.H. Krauss. Paratype male, Acayucan, Veracruz, Mexico, 23 October 1957, R. and K. Dreisbach.

Specimens studied. In addition to the types, male and two females, Cancun, Quintana Roo, Mexico, 18 August 1984, J. Villanueva, collected on coconut palm.

Notes. *C. aziza* can be most easily distinguished by the unique features of the parameres. Each paramere is slightly concave near the middle of its inner margin with the concavity bearing a variable number of irregular microteeth; there is no trace of the usual apical hook. The parameres of *C. ledusa* McAtee (Flynn and Kramer 1983:214, fig. 62C) are similar in shape but lack microteeth on the concavity. Also, the details of the aedeagal modifications are vastly different. *C. aziza* is a darkly fuscous to black species known only from Mexico, whereas, *C. ledusa* is a yellowish brown species known only from Brazil. *C. aziza* has been collected on coconut palm in Quintana Roo, Mexico.

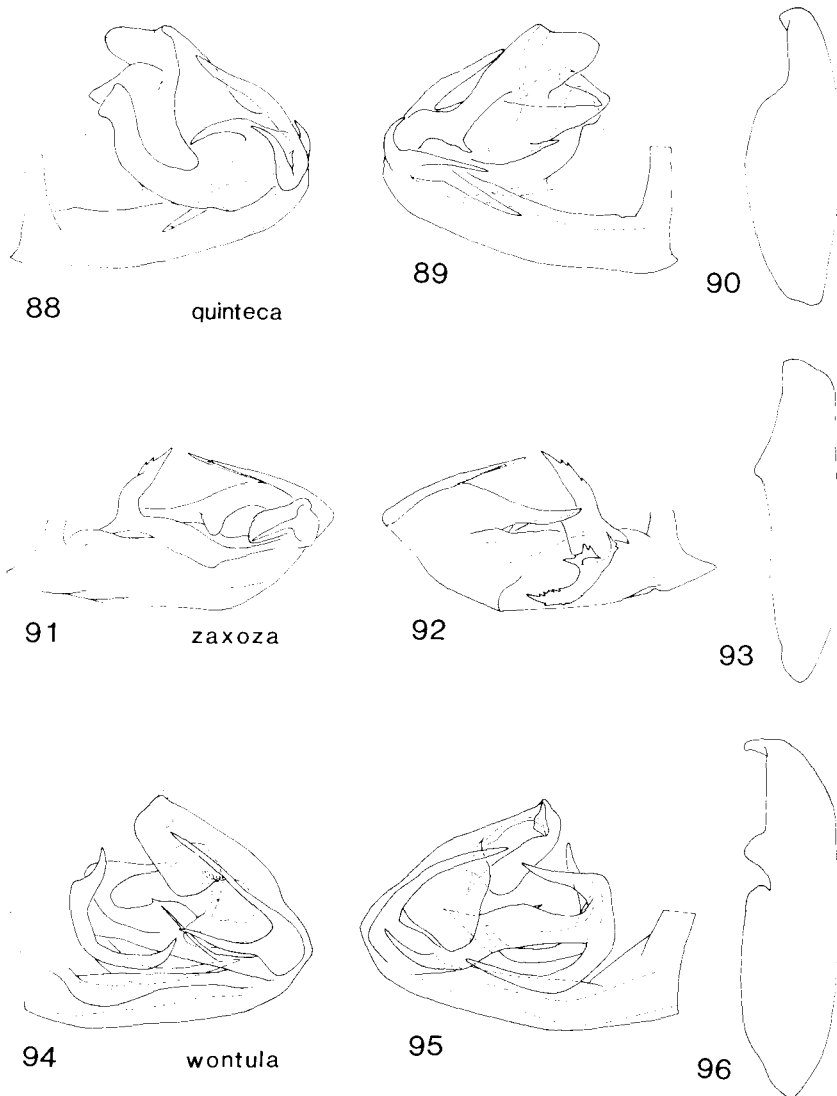
25. *Cedusa quinteca*, new species
(Figs. 88-90)

Salient features. Length of male 4.0 mm, female 4.5 mm. Ground color of head, pronotum, and legs, yellowish brown; sides of clypeus, intercarinal portions of face and crown, lightly embrowned; mesonotum uniformly dark red-brown; forewings in reflected light, dark red-brown; longitudinal veins darker; distal crossveins at least in part whitish.

Male genitalia. Right paramere in ventral view (Fig. 90) with inner margin roundly convex from base to about distal third, distal third of paramere narrowed with its inner apical angle slightly produced as broad, blunt tooth. Aedeagus in left lateral view (Fig. 88) with flagellar mass highly complex, with four apical or subapical processes of similar length, their apices variably directed, ventralmost process largely concealed by ventral margin of flagellar mass; dominant portion of flagellar mass with upper and lower extensions; upper extension very broad at base, unevenly tapered to rather narrow but blunt apex; lower portion moderately broad, not tapered, gradually upturned with short blunt, subtriangular expansion on proximal margin near apex; slender, colorless or clear, somewhat irregular subprocess arising near middle of ventral margin of lower portion; two large lobes beyond proximal margin of upper extension, dorsal lobe smaller and blunter than ventral lobe. Aedeagus in right lateral view (Fig. 89) with two longer and two shorter processes not visible in left lateral view; two longer processes arise near flagellar base and partly overlap; two short processes, widely separated, arise on side of flagellum.

Types. Holotype male (USNM Collection) and allotype female, Nisibon, El Cedro, Dominican Republic, 19 July 1969, J. Maldonado C.

Specimens studied. In addition to the types, three females with same



Figs. 88-96. Male genitalia. 88-90, *C. quinteca*, holotype. 91-93, *C. zaxoza*, holotype. 94-96, *C. wontula*, holotype. 88, 91, 94, aedeagus in left lateral view. 89, 92, 95, aedeagus in right lateral view. 90, 93, 96, right paramere in ventral view.

data as types. These specimens are slightly darker than the types and may or may not represent the same species.

Notes. *C. quinteca* is unique on the basis of the structures of the highly complex flagellar mass. The parameres resemble those of *C. unsera*, but they lack the distinct apical hooks found in that species.

26. *Cedusa zaxoza*, new species
(Figs. 91-93)

Salient features. Length of male 4.2-4.6 mm, female 4.8-5.0 mm. Ground color of head and pronotum dark red-brown; face with lateral edges and midline yellowish brown, carinate portions of crown and pronotum largely yellowish brown; mesonotum uniformly dark; legs yellowish brown; forewings in reflected light, dark red-brown; distal crossveins whitish.

Male genitalia. Right paramere in ventral view (Fig. 93) with inner margin rather straight and bearing narrow convexity on distal half; extreme apex of paramere obliquely truncate, without usual apical hook. Aedeagus in left lateral view (Fig. 91) with moderately long, slender process arising at apex and directed cephalad above dorsal margin of flagellum; flagellum roundly convex on dorsal and ventral margins in proximal half, distal half drawn out to straight elongation, two irregular modifications on ventral margin of flagellum in basal half, process nearest apex of shaft bearing slender, rather short process; with subflagellar process exceeding length of flagellum, subflagellar process directed cephalad, narrowest basally, rather abruptly expanded just before middle, its apex produced as ventral elongation and stouter, longer dorsal elongation, dorsal elongation with some sharp microteeth on its distal margin. Aedeagus in right lateral view (Fig. 92) similar to left lateral view but with additional process arising on side of shaft near base, process curved downward and directed caudad, its margins near base and apex with irregular microteeth.

Types. Holotype male (Canadian National Collection, Ottawa), Ft. Ogden, Florida, 10 April 1952, G.S. Walley. Paratype male, Torreya State Park, Florida, 29 April 1952, O. Peck. Paratype male and two females, Ocala, Florida, 29 April 1928, E.D. Ball.

Specimens studied. Known only from types.

Notes. *C. zaxoza* is closely related to *C. woodsholensis* Flynn and Kramer. The basic shapes of the parameres are the same in the two species; compare fig. 93 and Fig. 27C (Flynn and Kramer 1984:169). Details of the aedeagus are also quite similar: compare Figs. 91-92 and figs. 27A, 27B (ibid.). The major feature present in *C. zaxoza* but absent in *C. woodsholensis* is the apically pronged subflagellar process: this process is most readily seen in left lateral aspect as in Fig. 91.

27. *Cedusa wontula*, new species
(Figs. 94-96)

Salient features. Length of male 4.7 mm, female unknown. Ground color of head and pronotum dark red-brown, lateral margins of frons and crown yellowish brown, mesonotum uniformly dark-red brown;

legs yellowish brown, forewings in reflected light, dark red-brown; distal crossveins whitish.

Male genitalia. Right paramere in ventral view (Fig. 96) with oblique incision and short blunt projection on inner margin in distal half; apex with narrow blunt hook projecting inward. Aedeagus in left lateral view (Fig. 94) at apex with two slender processes arising from common base, processes directed obliquely cephalad; flagellum blunt with ventral fold; subflagellar process highly complex, its dorsal margin convex, its ventral margin almost straight, apical portion divided into four unequal branches, branches directed caudad or obliquely caudad. Aedeagus in right lateral view (Fig. 95) similar to left lateral view but with long slender process arising near base of flagellum, process curved near base and projecting obliquely cephalad; short apically acute process arising near base of subflagellar process, its apex directed caudad.

Types. Holotype male (USNM Collection), near Canarca, Panama, 8 August 1952, F.S. Blanton. Paratype male, Palo Seco Road to Fort Kobbe Beach, 24 June 1973, Erwin and Hevel.

Specimens studied. Known only from types.

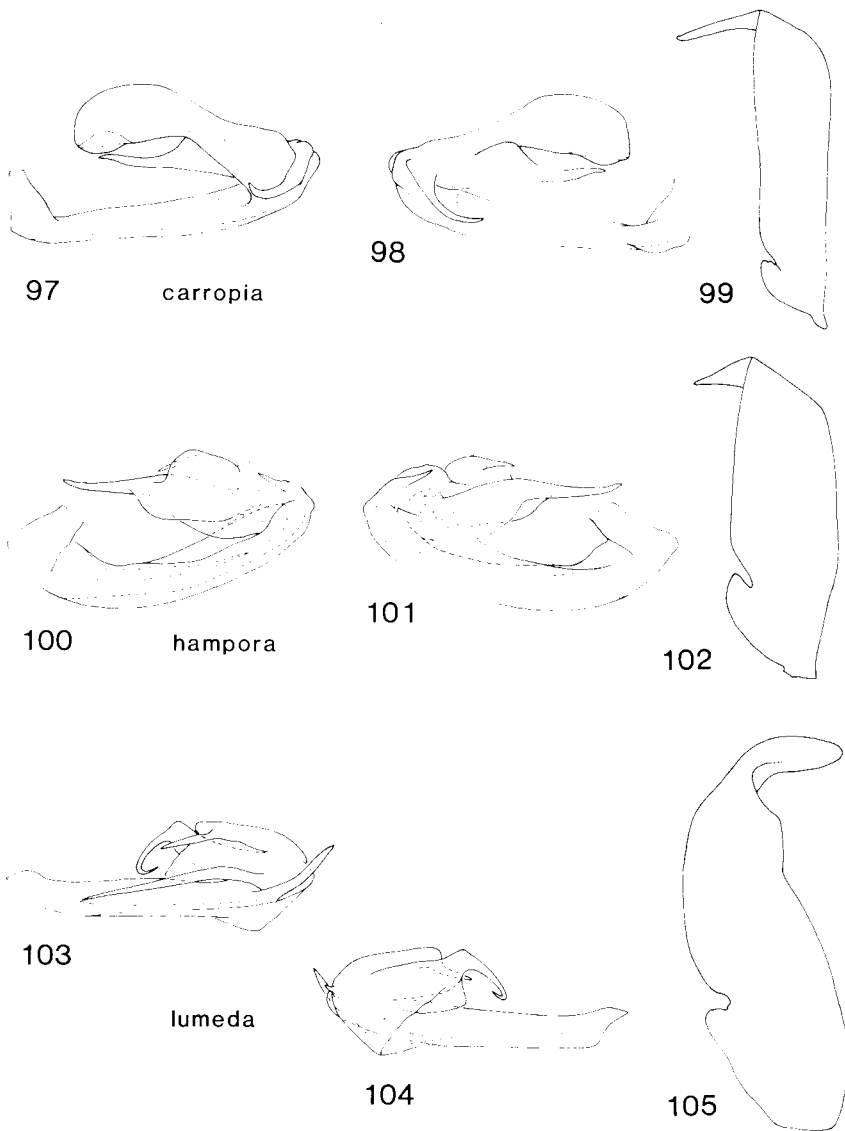
Notes. *C. wontula* is most closely related to *C. fowleri* Flynn and Kramer (1983:255, fig. 70). The major features for separating these two species are found in the apical branches of the subflagellar process. These differences are most apparent in left lateral views of the aedeagus: compare Fig. 94 and fig. 70A (Flynn and Kramer 1983:225).

28. *Cedusa carropia*, new species (Figs. 97-99)

Salient features. Length of male 3.9-4.2 mm, female unknown. Ground color of head and pronotum dark red-brown; lateral margins of face and crown, antennal ledges, antennae, and legs, yellowish brown; mesonotum uniformly dark red-brown; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 99) with lobe at base of straight inner margin; long, slender, inwardly directed hook at apex of inner margin. Aedeagus in left lateral view (Fig. 97) with slightly upturned, slender process arising at apex of shaft and directed cephalad; flagellum elongated and simple, constricted near middle, apex simple; subflagellar process slender and tapering to sharp apex from subquadrate base. Aedeagus in right lateral view (Fig. 98) almost identical to left lateral view but base of subflagellar process clearly defined on this side.

Types. Holotype male (USNM Collection), Limon Chagres River Plantation, Panama, 14 July 1918, from flooded bananas, H.F. Dietz. Paratype males, six with data identical to that of holotype.



Figs. 97-105. Male genitalia. **97-99**, *C. carropia*, holotype. **100-102**, *C. hampora*, holotype. **103-105**, *C. lumeda*, holotype. **97, 100, 103**, aedeagus in left lateral view. **98, 101, 104**, aedeagus in right lateral view. **99, 102, 105**, right paramere in ventral view.

Specimens studied. In addition to the types: four males, Flat Rock, one mile above Juan Mina, Chilibre River, Panama, 24 August 1918, H. Morrison; male, Juan Mina Citrus Plantation, 24 August 1918, Dietz and Zetek; two males, Anton, Panama, 11 November 1952, F.S. Blanton; and three males, Aguadulce, Panama, Panama, 25 September 1951, F.S. Blanton,

Notes. *C. carropia* is most similar to *C. carranzensis* Caldwell (Flynn and Kramer 1983:216, fig. 66). The two species share a similarly shaped flagellum and a simple subflagellar process. The flagellum of *C. carranzensis*, known only from north of Panama, lacks the constriction near the middle and bears a distinct tooth at its apex. The flagellum of *C. carropia*, known only from Panama, is constricted near its middle and lacks a tooth at its apex.

29. *Cedusa hampora*, new species
(Figs. 100-102)

Salient features. Length of male 3.5-3.9 mm, female unknown. Ground color of head and pronotum dark-red brown; lateral margins of face and crown, antennae, antennal ledges, and legs, yellowish brown; mesonotum dark red-brown; forewings in reflected light, dark red-brown; distal crossveins at least in part whitish.

Male genitalia. Right paramere in ventral view (Fig. 102) rather broad with lobe at base of straight inner margin; triangular, inwardly directed hook at apex of inner margin. Aedeagus in left lateral view (Fig. 100) at apex with short, slender, acute process directed obliquely cephalad; flagellum with folds or broad lobes on dorsal and ventral margins, terminating in long, slightly tapered, acute process. Aedeagus in right lateral view (Fig. 101) similar to left lateral view but with two short, slender, widely separated, acute processes near dorsal margin of flagellum; dorsal margin of flagellum appearing bilobed.

Types. Holotype male (USNM Collection), El Real, Panama, 19 March 1953, F.S. Blanton. Paratype male, Darien Jacque, Panama, 12 August 1952, F.S. Blanton.

Specimens studied. Known only from types.

Notes. *C. hampora* appears closely related to *C. simplex* Flynn and Kramer (1983:180, fig. 39) on the basis of the similarities found in the aedeagi of the two species, but the parameres are quite dissimilar. In *C. hampora* the inner margin of the paramere is straight, and there is a distinct lobe at the base of the inner margin. In *C. simplex* the inner margin of the paramere is strongly convex, and there is no lobe at the base of the inner margin. Except for the lobe at the base of the inner margin of the pygofer, the parameres of *C. hampora* and *C. tincta* Caldwell (Flynn and Kramer 1983:180, fig. 40C) are nearly alike; but their aedeagi are vastly different.

30. *Cedusa lumedda*, new species
(Figs. 103-105)

Salient features. Length of male 3.2 mm, female unknown. Ground color of head and thorax dark red-brown; mesonotum slightly darker; legs yellowish brown; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 105) with notch on inner margin in basal half; apex produced as blunt fingerlike projection turned outward. Aedeagus in left lateral view (Fig. 103) with two slender, tapered, acute processes arising near juncture of flagellum and shaft; lower process shorter and directed caudad; upper process longer and directed cephalad; flagellum with slender, tapered, acute process arising near middle of dorsal margin and directed cephalad; apex of flagellum terminating in very long slender process, process directed obliquely cephalad but recurved distally. Aedeagus in right lateral view (Fig. 104) similar to left lateral view, but with minute tooth at extreme apex of shaft.

Type. Holotype male (USNM Collection), Trinidad River, Panama, 2 May 1911, August Busck.

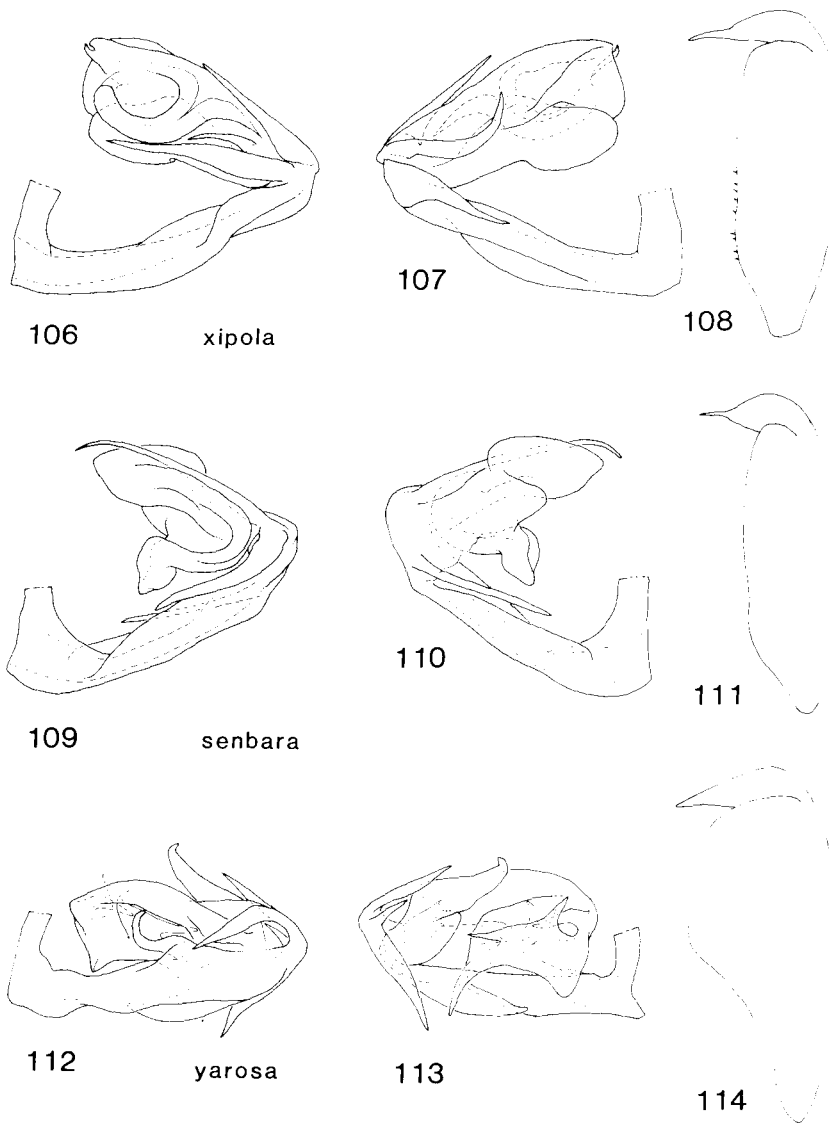
Specimens studied. Known only from type.

Notes. *C. lumeda* is distinctive on the basis of either of two major characters. The first of these is the outward or laterally curved apex of the paramere; if not an aberration, this feature only will distinguish it from all of its congeners. The second is the long, slender, recurved extension at the flagellar apex. The extension is actually much longer than illustrated, and its length can not be fully appreciated in lateral views of the aedeagus.

31. *Cedusa xipola*, new species
(Figs. 106-108)

Salient features. Length of male 4.8 mm, female unknown. Color of head, thorax, and legs, yellowish brown; mesonotum shade darker, forewings hyaline tinted with yellowish brown.

Male genitalia. Right paramere in ventral view (Fig. 108) with inner and outer margins essentially straight; apex with large inwardly directed hook; apex of hook very slender and needlelike. Aedeagus in left lateral view (Fig. 106) with two long slender processes originating at juncture of shaft and flagellum, both tapered to sharp tips and directed cephalad or obliquely cephalad; much shorter but similarly shaped and directed process originating on flagellum between longer processes; side of flagellum with rather stout, two-part process, portion of process nearest apex of flagellum bluntly rounded distally and directed cephalad, portion of process furthest from apex of flagellum curved dorsally and then obliquely ventrally to sharply tapered tip; extreme apex of flagellum with minute notch. Aedeagus in right lateral view (Fig. 107) with two sharply tapered processes originating near juncture of shaft and flagellum, upper process recurved in distal half, lower process originating from broad base and directed cephalad; flagellum appearing to consist of upper and lower portions that partly overlap.



Figs. 106-114. Male genitalia. **106-108**, *C. xipola*, holotype. **109-111**, *C. senbara*, holotype. **112-114**, *C. yarosa*, holotype. **106, 109, 112**, aedeagus in left lateral view. **107, 110, 113**, aedeagus in right lateral view. **108, 111, 114**, right paramere in ventral view.

Type. Holotype male (USNM Collection), Chiriqui, Fortuna, Panama, 1050 m, 29 May 1979, Henk Wolda.

Specimens studied. Known only from holotype.

Notes. *C. xipola* can be recognized at once by its yellowish brown coloration and the uniquely shaped process found on the left side of the flagellum. On the basis of male characters, it is probably closer to *C. senbara* n. sp. than to any other member of the genus. The two species share similarly shaped parameres, but *C. senbara* is a darker species with a differently shaped process on the left side of the flagellum.

32. *Cedusa senbara*, new species
(Figs. 109-111)

Salient features. Length of male 4.8 mm, female 5.1 mm. Color of head, thorax, and legs dark yellowish brown; mesonotum before posterior angle coffee brown; forewing hyaline tinted with dark yellowish brown, distal crossveins whitish.

Male genitalia. Right paramere in ventral view (Fig. 111) with inner and outer margins essentially straight; apex with stout inwardly directed hook, its apex drawn out and needlelike. Aedeagus in left lateral view (Fig. 109) with two long slender processes originating at juncture of shaft and flagellum, their apices directed cephalad or obliquely cephalad; side of flagellum with rather broad untapered process, process directed caudad, then curved ventrad, and ultimately directed cephalad, its apex much enlarged and irregularly oval. Aedeagus in right lateral view (Fig. 110) with lanceolate process arising in distal half of shaft and directed cephalad; flagellum with folds or irregular lobes.

Types. Holotype male (USNM Collection), Chiriqui, Fortuna, Panama, 1050 m, 4 August 1978, Henk Wolda. Allotype female with same data but collected 17 October 1977.

Specimens studied. Known only from types.

Notes. *C. senbara* is distinguished by its dark yellowish brown color and by the approximately U-shaped process on the left side of the flagellum. The right paramere is almost identical to that of *C. xipola*; but details of the aedeagus are very different, especially the shape and form of the process on the left side of the flagellum.

33. *Cedusa yarosa*, new species
(Figs. 112-114)

Salient features. Length of male 4.25 mm, female unknown. Ground color of head, pronotum, and legs tawny or yellowish brown; face with two dark brown longitudinal stripes, sides of clypeus lightly embrowned, central portion of crown and posterior margin of pronotum

embrowned, mesonotum dark red-brown, forewings in reflected light tinted with dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 114) narrowed in basal half, broadened in distal half; apex with stout inwardly directed hook, tip of hook sharply acute. Aedeagus in left lateral view (Fig. 112) with moderately long, recurved, apically acute process at apex; shorter, distally upturned process arising near middle of dorsal margin of shaft; flagellum stout and appearing broadly subtruncated on distal edge. Aedeagus in right lateral view (Fig. 113) with three-pronged process at apex, process approximately F-shaped; basal portion of flagellum with broad and irregular process, process lobed ventrally and somewhat narrowed distally; distal portion of flagellum greatly enlarged and directed cephalad, its apex drawn out to form acute, tapered, decurved process, its ventral margin subtriangularly produced; its dorsal margin with two prongs, moderately stout but short process arising near base of enlarged distal portion.

Type. Holotype male (USNM Collection), taken on cargo originating from Argentina aboard ship "Rio Gallegos," 4 April 1945.

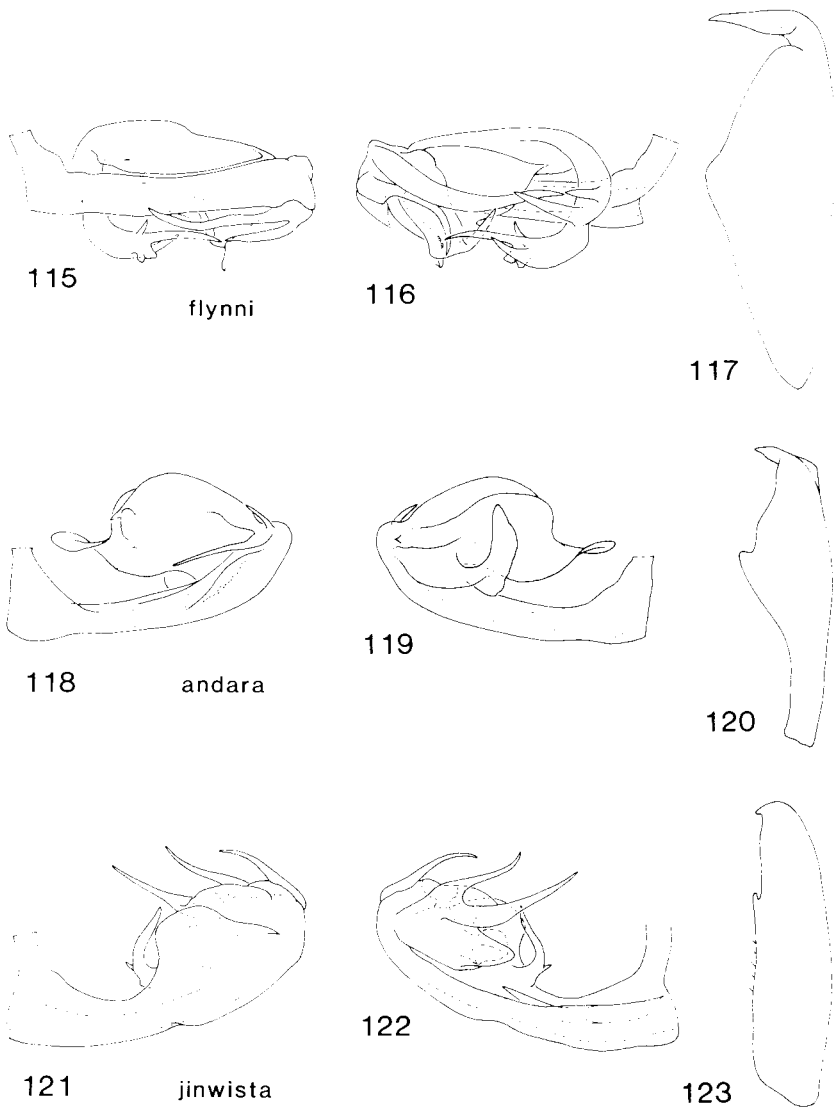
Specimens studied. Known only from holotype.

Notes. *C. yarosa* is immediately separable from all of its congeners on the basis of the expanded and elaborately modified distal portion of the aedeagal flagellum. To the extent that the apical portion of the flagellum is also decurved in *C. flynni* n. sp., these two species are probably more closely related to each other than to other members of *Cedusa*.

34. *Cedusa flynni*, new species (Figs. 115-117)

Salient features. Length of male 4.5 mm, female unknown. Ground color of head and pronotum yellowish brown; central portions of frons and clypeus brownish to orange-brown; sides of head below eyes, sides of clypeus, and central portions of pronotum, variably embrowned; mesonotum uniformly deep red-brown; legs mainly yellowish brown, anterior tibiae dark red-brown, other tibiae only vaguely embrowned at their bases, all femora at least partly embrowned on middle half; forewings dark red-brown in reflected light.

Male genitalia. Right paramere in ventral view (Fig. 117) with inner margin broadly and subtriangularly produced, broadest near middle; apex with strong, inwardly directed hook. Aedeagus in left lateral view (Fig. 115) with forked process at ventrodistal angle of shaft, upper fork about 2× length of lower fork and less regular; flagellum prolonged and decurved distally, apex of prolongation modified with four or five projections of different lengths. Aedeagus in right lateral view (Fig. 116) with two processes originating near apex of shaft, upper process longer and stouter than ventral process, upper process slightly recurved, lower



Figs. 115-123. Male genitalia. 115-117, *C. flynni*, holotype. 118-120, *C. andara*, holotype. 121-123, *C. jinwista*, holotype. 115, 118, 121, aedeagus in left lateral view. 116, 119, 122, aedeagus in right lateral view. 117, 120, 123, right paramere in ventral view.

process slightly decurved, both sharply acute apically; below apical processes two large lobelike structures, upper structure suboval and terminating with sharply tapered tip, lower structure subquadrate and terminating with tapered prolongation; flagellum similar to left lateral view but with two straight projections or processes arising on prolongation before its apex, lower of these longer and more tapered, both directed caudad.

Type. Holotype male (USNM Collection), Tucuman, Argentina, January-March, 1941, K.J. Hayward.

Specimens studied. Known only from holotype.

Notes. *C. flynni* is unique in the genus on the basis of the twice-curved and elaborated distal prolongation of the aedeagal flagellum. It is probably most closely related to *C. yarosa*; see notes under that species. It is named for my late friend, colleague, and fellow-student of the Derbidae, Professor John E. Flynn.

35. *Cedusa andara*, new species
(Figs. 118-120)

Salient features. Length of male 3.9 mm, female 5.3 mm. Ground color of head and thorax very close to black; subantennal ledges at least partly and legs entirely pale stramineous or whitish; forewings very close to black in reflected light.

Male genitalia. Right paramere in ventral view (Fig. 120) stalked in basal half; widest at middle projection; apex with moderately short, stout, inwardly directed hook. Aedeagus in left lateral view (Fig. 118) with two lanceolate processes originating near juncture of shaft and flagellum, lower process about 3× length of upper process; flagellum large and suboval, its apex twisted to form oval tip. Aedeagus in right lateral view (Fig. 119) similar to left lateral view but with stout, irregular, distally upturned process originating near base of flagellum.

Types. Holotype male (USNM Collection), Chiriqui, Guadalupe Arriba, Panama, 2100 m, 21-27 December 1983, Coll. Henk Wolda. Allotype female with same data but collection date 22-28 February 1984.

Specimens studied. Known only from types.

Notes. *C. andara* is distinguished from its congeners on the basis of the twisted apex of the aedeagal flagellum and the stout but rather irregular process on the right side of the aedeagus. This process is not pigmented and could be easily overlooked.

36. *Cedusa jinwista*, new species
(Figs. 121-123)

Salient features. Length of male 5.3 mm, female unknown. Ground color of head tawny, face with pair of poorly defined brown longitudinal stripes that continue onto crown, sides of head embrowned below antennal ledges; dorsal portions of pronotum, mesonotum, and legs, dark yellowish brown; forewings in reflected light, reddish brown; distal crossveins whitish.

Male genitalia. Right paramere in ventral view (Fig. 123) with inner margin nearly straight but interrupted by very small, distally projecting, blunt tooth on distal half; apex with short, inwardly directed tooth. Aedeagus in left lateral view (Fig. 121) with dorsal margin of shaft convexly expanded in distal half; apex of shaft with slender, tapered, acute process directed obliquely cephalad; two other rather similar processes visible above flagellar mass. Aedeagus in right lateral view (Fig. 122) with two slender, tapered, acute processes arising from common base on side of flagellum and directed obliquely cephalad; below them blunt lobe, beyond flagellum slightly sinuous, tapered process directed obliquely caudad, minute tooth on proximal margin in basal half of sinuous process.

Type. Holotype male (USNM Collection), 39 mi. SW Wineperu, Mazaru River, Esseq., Guyana, 17-18 March 1969, Duckworth and Dietz.

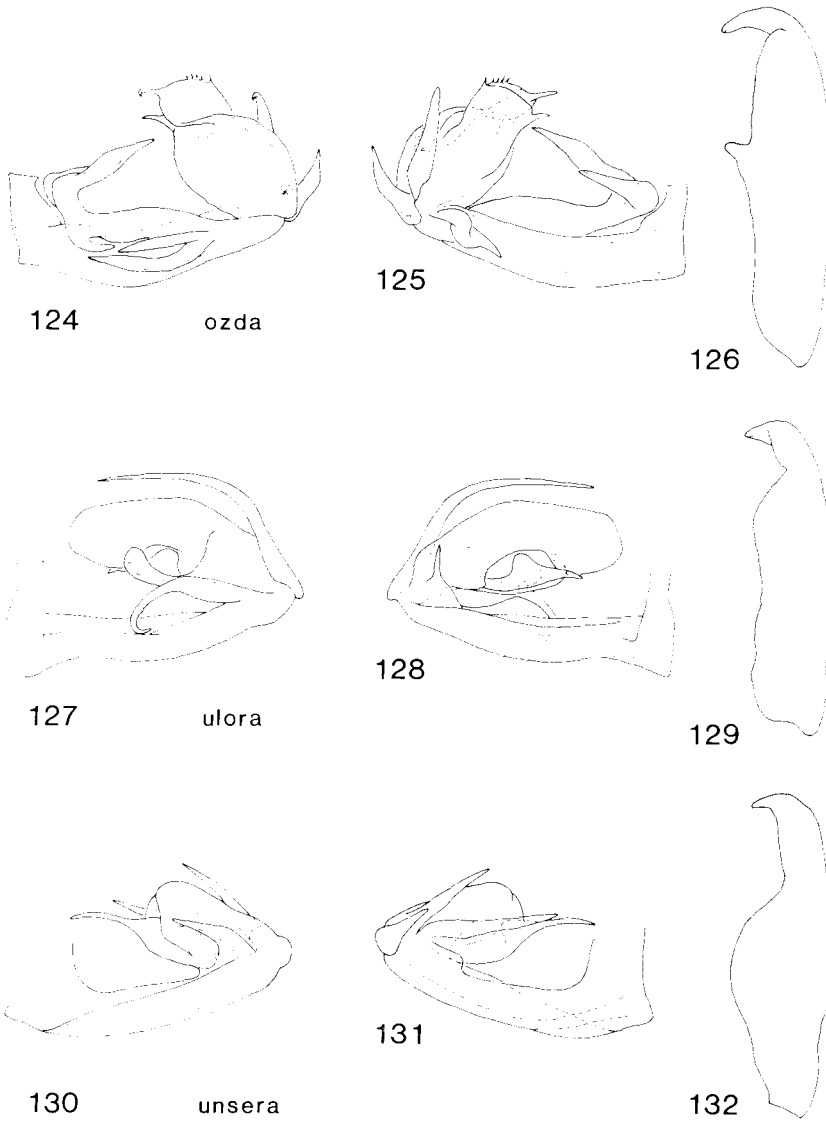
Specimens studied. Known only from holotype.

Notes. *C. jinwista* can be readily recognized by the shape of the parameres and by the three similarly shaped processes that project above the flagellar mass as seen in a left lateral view of the aedeagus.

37. *Cedusa ozda*, new species
(Figs. 124-126)

Salient features. Length of male 3.8 mm, female 4.2-4.6 mm. Ground color of head and pronotum red-brown; lateral margins of face and crown, carina separating face and crown, longitudinal midline of face, antennae, and most of antennal ledges, yellowish brown; mesonotum uniformly dark red-brown; legs yellowish brown, at times vaguely shaded with brownish; forewings in reflected light, tinted with dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 126) with inner margin bearing blunt projection near middle; apex with strong, rather blunt, inwardly directed apical hook. Aedeagus in left lateral view (Fig. 124) with main portion of flagellum broadly oval and bearing slender and rather short apical projection; above main portion of flagellum smaller, broadly oval portion bearing slender projection at apex and some fine, slender microteeth on dorsal margin; subflagellar process



Figs. 124-132. Male genitalia. 124-126, *C. ozda*, holotype. 127-129, *C. ulora*, holotype. 130-132, *C. unsera*, holotype. 124, 127, 130, aedeagus in left lateral view. 125, 128, 131, aedeagus in right lateral view. 126, 129, 132, right paramere in ventral view.

unusually large and long, nearly reaching base of aedeagus, its ventral margin with two processes originating in basal half, both rather stout, apically acute, directed cephalad, and arising from common base, upper process straight and shorter than lower process, lower process broadly but slightly recurved; short hooklike process on ventral margin of shaft distally; its apex directed caudad; apical portion of subflagellar process turned dorsally and then split to form two long, asymmetrical, caudally directed forks. Aedeagus in right lateral view (Fig. 125) similar to left lateral view but with three rather stout processes arising near juncture of shaft and flagellum, apicalmost two essentially directed dorsally, other process somewhat twisted and directed obliquely cephalad.

Types. Holotype male (USNM Collection), Cuernavaca-Acapulco Road, Mexico, 20 August 1936, Ball and Stone. Paratypes: two males and four females with data identical to that of holotype.

Specimens studied. Known only from types.

Notes. *C. ozda* is unique in several features. The most conspicuous of these are the large and bizarre subflagellar process as seen in a left lateral view of the aedeagus and the form of the flagellum, also as seen in a left lateral aspect. Here the shape resembles that of a small round bird with an open beak.

38. *Cedusa ulora*, new species
(Figs. 127-129)

Salient features. Length of male 3.6 mm, female unknown. Color of head and thorax uniformly red-brown; anterior legs light brownish, other legs paler except for femora; forewings in reflected light, tinted with pale red-brown.

Male genitalia. Right paramere in ventral view (Fig. 129) with inner margin slightly convex near base and beyond middle; apical portion of paramere narrowed and somewhat necklike, terminating with short, stout, inwardly directed hook. Aedeagus in left lateral view (Fig. 127) at apex of shaft with long, slender, apically acute process projecting above and following curvature of dorsal margin of flagellum; flagellum long and comparatively simple, its ventral margin concave on middle half; broadly U-shaped process arising on side of flagellum in basal half, its apex somewhat bulbous; moderately stout process arising at juncture of shaft and flagellum, process narrowed at midlength and decurved at apex to form hook. Aedeagus in right lateral view (Fig. 128) similar to left lateral view but with short, upright, acute projection near flagellar base; and process in concavity on ventral margin of flagellum, process with prominent convexity near midlength on its dorsal margin.

Type. Holotype male (USNM Collection), Aguarico, Napa, Ecuador, 16 August 1975, Andrea Langley.

Specimens studied. Known only from holotype.

Notes. *C. ulora* can be recognized by a combination of characters that include a comparatively simple flagellum that is concave on its ventral margin and the three highly dissimilar processes associated with this concavity.

39. *Cedusa unsera*, new species
(Figs. 130-132)

Salient features. Length of male 3.7 mm, female unknown. Ground color of head and pronotum red-brown; antennal ledges paler; mesonotum dark red-brown; legs brownish yellow; forewings in reflected light, tinted with red-brown.

Male genitalia. Right paramere in ventral view (Fig. 132) with inner margin strongly convex but narrowed distally to form necklike region before inwardly directed apical hook. Aedeagus in left lateral view (Fig. 130) with moderately stout, apically acute, cephalically directed process arising at juncture of shaft and flagellum; lower portion of flagellum terminating with slender, cephalically directed process; upper portion of flagellum with distal angulation overlapping lower portion of flagellum. Aedeagus in right lateral view (Fig. 131) similar to left lateral view but with three tapered, apically acute, cephalically directed processes of different lengths arising at or near apex of shaft.

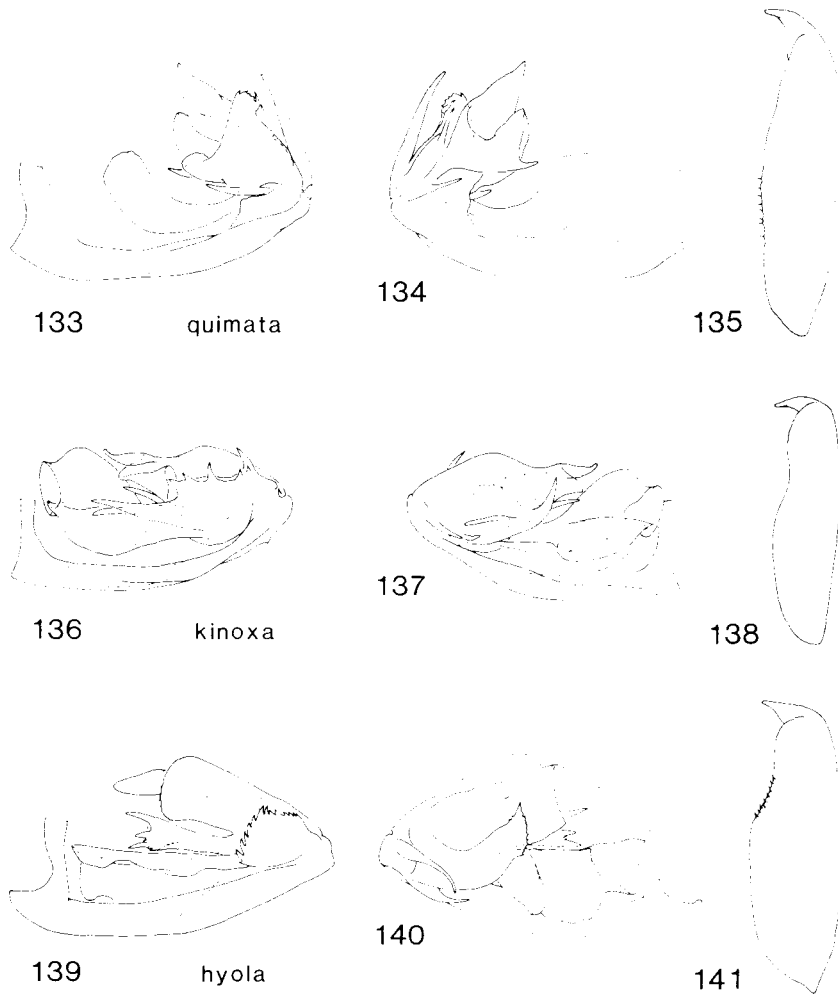
Types. Holotype male (USNM Collection), Alcal de Diaz, Panama, 10 October 1952, F.S. Blanton. Paratype males: two, Mojinga Swamp, Canal Zone, Panama, 28 August 1951, F.S. Blanton; one, Mojinga Swamp, Canal Zone, Panama, 5 September 1951, F.S. Blanton; one, same data except collection date 14 November 1951; and one, Patino Point, Panama, 8 September 1952, F.S. Blanton.

Specimens studied. Known only from types.

Notes. *C. unsera* can be distinguished from its congeners on the basis of the shape of the flagellum and its associated processes. The right paramere does resemble that of *C. panamensis* Flynn and Kramer (1983:216, fig. 63C), also known only from Panama, but details of the aedeagus are vastly different in the two species.

40. *Cedusa quimata*, new species
(Figs. 133-135)

Salient features. Length of male 4.1 mm, female unknown. Ground color of head and pronotum red-brown; edges of frons and antennal ledges paler; mesonotum uniformly red-brown; legs brownish yellow with some dark shading on femora; forewings in reflected light, strongly tinted with red-brown.



Figs. 133-141. Male genitalia. 133-135, *C. quimata*, holotype. 136-138, *C. kinoxa*, holotype. 139-141, *C. hyola*, holotype. 133, 136, 139, aedeagus in left lateral view. 134, 137, 140, aedeagus in right lateral view. 135, 138, 141, right paramere in ventral view.

Male genitalia. Right paramere in ventral view (Fig. 135) with inner margin mildly convex, apex with inwardly directed apical hook. Aedeagus in left lateral view (Fig. 133) at apex with moderately long, dorsally directed, tapered process; largest feature of flagellar mass consisting of subtriangular lateral portion, this portion irregularly microdentate dorsally and with three short projections or processes on or near ventral margin; rest of flagellar mass consisting of two smaller subtriangular lobes projecting at apex; subflagellar process large, simple, distally upturned, narrowest at base, of uniform width distally, with

apical margin rounded; in dorsal view open at apex. Aedeagus in right lateral view (Fig. 134) similar to left lateral view but with dominant feature of flagellar mass consisting of stout lateral modification that bears acute tooth at ventroapical margin and two large stout elevations on its dorsal margin; proximal elevation with some irregular microteeth apically and subapically.

Type. Holotype male (Canadian National Collection, Ottawa), 24 miles west of La Ciudad, Durango, Mexico, 4 June 1964, H.F. Howden.

Specimens studied. Known only from holotype.

Notes. *C. quimata* is unique in the genus on the basis of several features of the aedeagus. The most obvious of these features is the large but simple subflagellar process that is approximately pipe-shaped.

41. *Cedusa kinoxia*, new species
(Figs. 136-138)

Salient features. Length of male 5.0 mm, female 5.3 mm. Ground color of head, pronotum, and mesonotum essentially black; edges of subantennal ledges paler; legs dark tawny, femora and anterior tibiae shaded darker; forewings in reflected light, essentially black; distal crossveins whitish.

Male genitalia. Right paramere in ventral view (Fig. 138) with inner margin mildly concave in distal half; apex with rather small inwardly directed hook. Aedeagus in left lateral view (Fig. 136) with large cephalically directed process on side of flagellum, process broadest basally with five or six irregular elongated teeth on dorsal margin in basal half and prolonged apically to form long, tapered, sharply acute terminus; two similarly shaped structures projecting near terminus and partly concealed by it; dorsal area of flagellar mass with sub-oval portion terminating with two cephalically directed, short, rather thick processes; subflagellar process much enlarged and suboval in distal half. Aedeagus in right lateral view (Fig. 137) similar to left lateral view but with three or four additional short, acute processes on side of flagellum in its lower half.

Types. Holotype male (USNM Collection), Chiriqui, Bambito, 1400 m, Panama, 10 June 1976, Wolda-Estribi. Allotype female, Chiriqui, Boquete, 1250 m, Panama, 28 December 1974, Coll. H. Wolda.

Specimens studied. Known only from types.

Notes. *C. kinoxia* can be distinguished by its nearly black coloration, the shape of the dominant process on the left side of the flagellum, and the rather oval and simple form of the distal portion of the subflagellar process.

42. *Cedusa hyola*, new species

(Figs. 139-141)

Salient features. Length of male 5.3-5.5 mm, female 5.5-5.8 mm. Ground color of head, pronotum, and mesonotum fuscus; antennal ledges pale; legs brownish yellow, anterior legs slightly darker; forewings in reflected light, fuscus.

Male genitalia. Right paramere in ventral view (Fig. 141) broadest in basal half, narrowed in distal half; apex with rather small inwardly directed hook. Aedeagus in left lateral view (Fig. 139) with irregular semicircular process on or near base of flagellum, process dentate on dorsal and distal margins; upper portion of flagellum subquadrate with distal margin rounded; lower portion of flagellum stalked with two or three elongated teeth at apex; subflagellar process long, nearly touching base of aedeagus, its sides curved to form saddle on dorsal margin of shaft. Aedeagus in right lateral view (Fig. 140) at or near apex with two slender, tapered, rather short, cephalically directed processes; flagellum extended on dorsodistal angle as blunt projection; lower portion of flagellum with broad, untapered process that gradually upturns distally, its apical margin finely and irregularly serrate; subflagellar process broad and irregular in outline due to lateral folds.

Types. Holotype male (Canadian National Collection, Ottawa) and allotype female, Zontehuitz near San Cristobal, Chiapas, 9500 ft., Mexico, 27 May 1969, W.R. Mason. Paratypes: three males and one female with identical data.

Specimens studied. Known only from types.

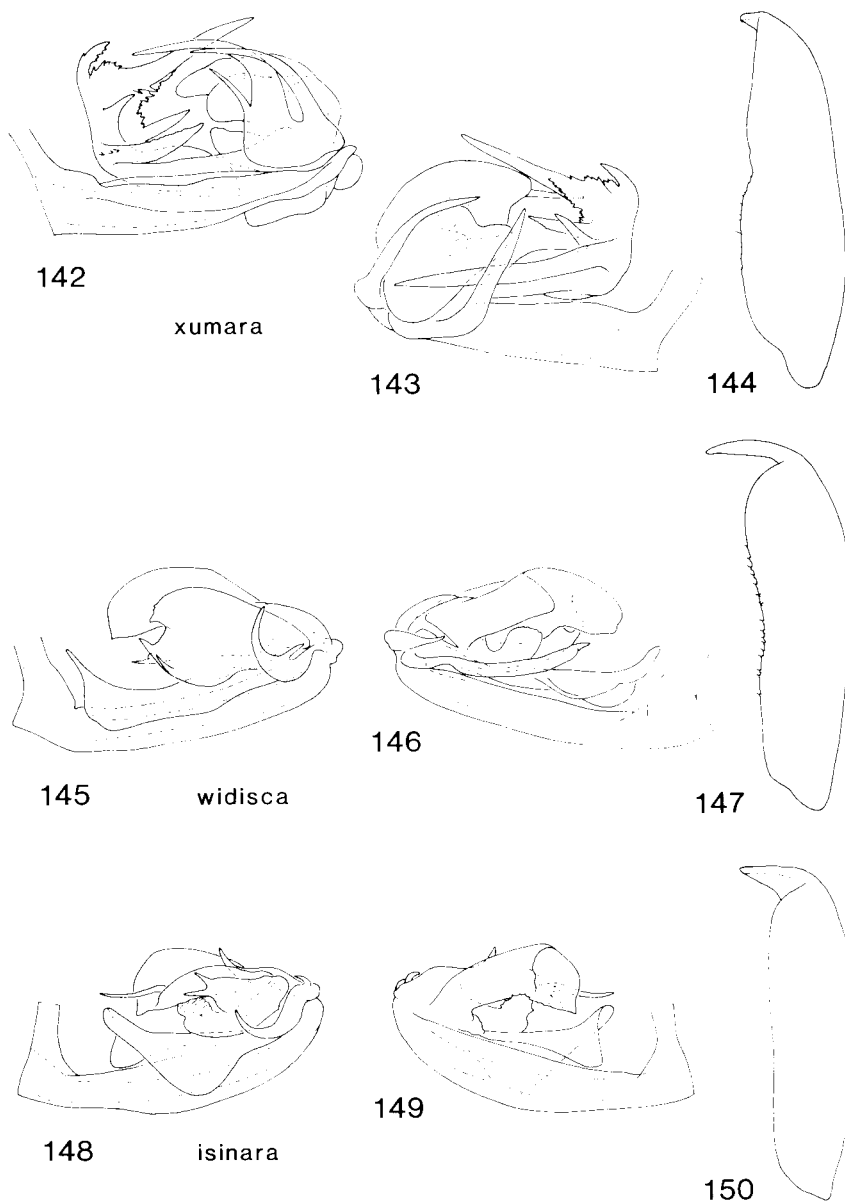
Notes. *C. hyola* is unique in many ways, but the single feature that will separate it from all of its congeners is the dorsally dentate, semicircular process at the base of the flagellum as seen in a left lateral view of the aedeagus.

43. *Cedusa xumara*, new species

(Figs. 142-144)

Salient features. Length of male 5.0-5.5 mm, female unknown. Ground color of head, pronotum, and mesonotum dark fuscus to black; lateral margins of frons, antennae, and antennal ledges pale; legs yellowish brown, tarsi shade darker; forewings in reflected light, darkly fuscus to black.

Male genitalia. Right paramere in ventral view (Fig. 144) with inner margin slightly convex in basal half; apex with small, blunt, inwardly directed hook. Aedeagus in left lateral view (Fig. 142) with large, dorsally branched structure at juncture of shaft and flagellum; branches of unequal size and length, two largest branches recurved and tapered to slender, sharp tips, smallest branch uniformly slender, apically acute, and directed obliquely dorsad; flagellum approximately round, consisting of three lobes or folds, dorsalmost lobe longer than others;



Figs. 142-150. Male genitalia. 142-144, *C. xumara*, holotype. 145-147, *C. widisca*, holotype. 148-150, *C. isinara*, holotype. 142, 145, 148, aedeagus in left lateral view. 143, 146, 149, aedeagus in right lateral view. 144, 147, 150, right paramere in ventral view.

subflagellar process highly developed and complex, stalked basally, distally upturned, and modified with five subprocesses of different lengths and stoutness, all subprocesses directed caudad, upper two with ventral margins and other areas variably modified with irregular teeth. Aedeagus in right lateral view (Fig. 143) similar to left lateral view but with two long, tapered, apically acute processes arising at or near juncture of shaft and flagellum, neither perfectly straight but both directed obliquely dorsad.

Types. Holotype male (USNM Collection), Limoncocha, Napo, Ecuador, 11 June 1977, P.J. Spangler and D.R. Givens. Paratype male, 22 km East of Puyo, Ecuador, 2 February 1976, Spangler et al.

Specimens studied. Known only from types.

Notes. *C. xumara* possesses one of the most bizarre subflagellar processes found in any member of the genus *Cedusa*, and the modifications of this structure alone will separate it from all other congeners.

44. *Cedusa widisca*, new species
(Figs. 145-147)

Salient features. Length of male 3.3-3.6 mm, female unknown. Ground color of head and pronotum dark red-brown; frons with longitudinal midline and lateral margins yellowish brown; antennal ledges pale; mesonotum uniformly dark red-brown; legs, except for pale hind tibiae, largely infuscated; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 147) very slightly concave on middle of inner margin; apex with comparatively slender, moderately long, inwardly directed hook. Aedeagus in left lateral view (Fig. 145) with strongly recurved, tapered process near apex, process with secondary, slender projection on its dorsal margin; flagellum with upper portion broad, elongated, and slightly decurved; flagellum with lower portion broader, shorter, and irregularly rounded distally, distal margin of lower portion of flagellum with quadrate or subquadrate excavation, below excavation two or three short acute projections; subflagellar process rather broad, nearly reaching base of shaft, and with slender projection on dorsal margin near apex. Aedeagus in right lateral view (Fig. 146) with two short acute processes arising near apex of shaft and third longer, apically narrowed process arising below them, all processes directed obliquely cephalad; upper side of flagellum with quadrate section, lower side of flagellum with smaller stout U-shaped section; subflagellar process partly folded or bent distally to form saddle on shaft.

Types. Holotype male (USNM Collection), Gillespie County, Texas, 7 May 1946, D.F. and J.N. Knull, from J.S. Caldwell Collection. Paratypes: three males with identical data.

Specimens studied. Known only from types.

Notes. *C. widisca* can be immediately recognized on the basis of the quadrate incision on the distal margin of the lower portion of the flagellum as observed in a left lateral view of the aedeagus and by the long subflagellar process that is partly folded or bent to rest astride the aedeagal shaft.

45. *Cedusa isinara*, new species
(Figs. 148-150)

Salient features. Length of male 3.5 mm, female unknown. Ground color of head, pronotum, and mesonotum dark red-brown; lateral margins of frons yellowish brown; antennal ledges at least in part pale; legs largely infuscated yellowish brown; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 150) with inner margin essentially straight; apex with well-developed, inwardly directed hook. Aedeagus in left lateral view (Fig. 148) at apex with moderately stout, tapered, somewhat decurved and then recurved process, process bearing slender elongated tooth near base on dorsal margin; upper portion of flagellum stout, elongated, and somewhat decurved distally, its side with fold concealing bases of two slender, widely separated, acute processes, one process projecting beyond apex, other process projecting above dorsal margin; lower portion of flagellum consisting of two subdivisions, upper subdivision short and broad with sharp distal fork, lower division longer with apical portion upturned and roughened; subflagellar process large, stout, and foot-shaped, asymmetrically folded or bent to straddle dorsum of aedeagal shaft. Aedeagus in right lateral view (Fig. 149) similar to left lateral view except subflagellar process not foot-shaped but subtriangularly expanded distally.

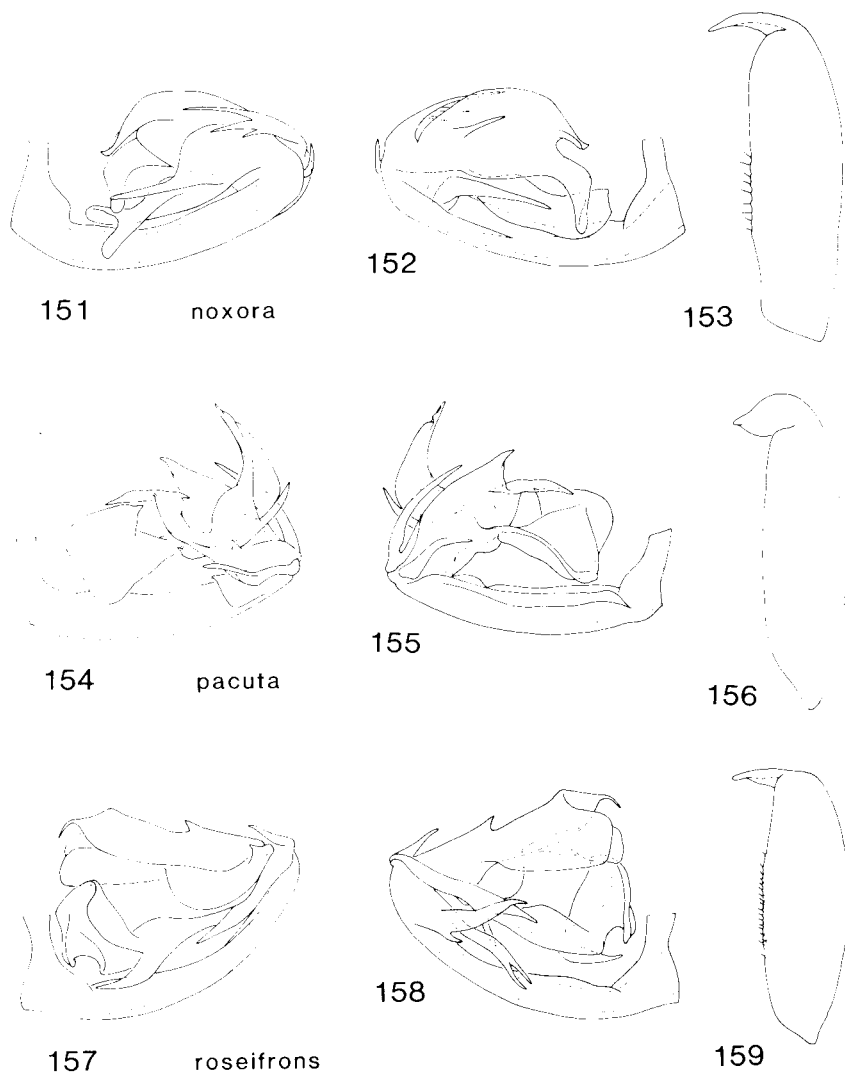
Type. Holotype male (USNM Collection), Jacala, Mexico, 17 August 1936. E.D. Ball.

Specimens studied. Known only from holotype.

Notes. *C. isinara* differs from other members of the genus by the large foot-shaped subflagellar process that is folded or bent to straddle the dorsal margin of the aedeagal shaft as observed in a left lateral aspect. The complex modifications of the flagellum are also unique.

46. *Cedusa noxora*, new species
(Figs. 151-153)

Salient features. Length of male 5.0 mm, female 5.0 mm. Ground color of head, pronotum, and mesonotum dark fuscus to black; lateral margins of frons and portions of antennal ledges pale; legs largely dark red-brown, posterior tibiae and tarsi at least in part paler; forewings in reflected light, dark fuscus to black.



Figs. 151-159. Male genitalia. 151-153, *C. noxora*, holotype. 154-156, *C. pacuta*, holotype. 157-159, *C. roseifrons*, specimen from Taxco, Mexico. 151, 154, 157, aedeagus in left lateral view. 152, 155, 158, aedeagus in right lateral view. 153, 156, 159, right paramere in ventral view.

Male genitalia. Right paramere in ventral view (Fig. 153) with inner margin essentially straight; apex with well-developed, inwardly directed hook. Aedeagus in left lateral view (Fig. 151) with thrice-pronged process at apex and smaller, shorter, acute process below it; side of flagellum with cephalically directed, lanceolate process arising from broad, dorsally rounded base; dorsal margin of flagellum terminating with apically blunt, tapered process; subflagellar process slender, dis-

tally divided into two apically rounded portions that straddle shaft. Aedeagus in right lateral view (Fig. 152) similar to left lateral view but with long, tapered, acute, cephalically directed process arising on distal portion of shaft and shorter, smaller, similarly shaped process arising on side of flagellum; distoventral margin of flagellum produced as moderately large, foot-shaped extension; subflagellar process broad and somewhat truncated at apex.

Types. Holotype male (USNM Collection) and allotype female, Patzcuaro, Michoacan, Mexico, 7 July 1964, Paul J. Spangler.

Specimens studied. Known only from types.

Notes. *C. noxora* presents several unique features of the aedeagus that characterize the species. The most conspicuous of these features are the thrice-pronged process at the apex of the shaft as seen in a left lateral view and the rather large and foot-shaped extension of the distoventral margin of the flagellum as seen in a right lateral view.

47. *Cedusa pacuta*, new species
(Figs. 154-156)

Salient features. Length of male 5.25 mm, female 5.4 mm. Ground color of head, pronotum, mesonotum, and legs red-brown to dark fuscus; mesonotum almost black; antennal ledges partly pale; legs uniformly dark; forewings in reflected light, darkly fuscus to almost black.

Male genitalia. Right paramere in ventral view (Fig. 156) with inner margin nearly straight; basal area narrowed; apex with stout, inwardly directed hook, its dorsal margin strongly convex. Aedeagus in left lateral view (Fig. 154) with flagellar mass complex and consisting of several dorsally projecting processes or angulations, most of these slender and acute, most conspicuous process directed cephalad with its apical portion broadly transverse; distalmost portion of flagellum subquadrate, broad, and essentially unornamented. Aedeagus in right lateral view (Fig. 155) similar to left lateral view but with slender, somewhat irregular, long, cephalically directed process situated near upper margin of shaft, its apex nearly reaching base of aedeagus.

Types. Holotype male (Canadian National Collection, Ottawa) and allotype female, Banhado, Parana, Brazil, 14 February 1972, E.G. and E.A. Munroe.

Specimens studied. Known only from types.

Notes. *C. pacuta* can be distinguished by the form of the apical hooks on the parameres and by the composition of the multiple processes and angulations composing the flagellar mass.

48. *Cedusa roseifrons*, new species
(Figs. 157-159)

Salient features. Length of male 4.2-4.8 mm, female 4.8-5.6 mm. Ground color of head ranging from pale brownish yellow to tawny; sides of clypeus usually rather heavily infuscated, front of clypeus usually less heavily or not at all infuscated; frons and its sides, including antennae and antennal ledges, variably tinted with pink to scarlet, tinting usually most pronounced on middle portion of frons and below antennal ledges on sides of head; crown and pronotum brownish yellow and lightly infuscated or not, pronotum usually darker than crown; mesonotum ranging from dark red-brown to nearly black; legs yellowish brown, sometimes tinted darker; forewing in reflected light, dark red-brown to black.

Male genitalia. Right paramere in ventral view (Fig. 159) with inner margin essentially straight; apex with moderate-sized, inwardly directed hook. Aedeagus in left lateral view (Fig. 157) at apex with moderately long, apically acute, cephalically directed process, its base with shorter and narrower subprocess; flagellum consisting of elongated upper portion bearing tooth on dorsal margin in basal half and slender, decurved extension at apex; lower portion of flagellum with ventral margin strongly convex in basal half, distal half gradually and slightly expanded from base to apex, apex bluntly rounded; subflagellar process slenderly stalked in basal portion, distoventral margin produced as acute, tapered process, distodorsal portion of subflagellar process developed as large subquadrate area, subquadrate area with variably developed hook on middle of posterior margin. Aedeagus in right lateral view (Fig. 158) similar to left lateral view but with three rather dissimilarly shaped processes arising on or near apex or apical portion of shaft; uppermost process broadly forked at apex; middle process with elongated tooth on ventral margin near base, ventral margin slightly convex, dorsal margin slightly concave near middle, extreme apex narrowed and acute; ventralmost process narrowly forked at apex; all processes subequal in length and directed cephalad or obliquely cephalad.

Types. Holotype male (USNM Collection), Cuernavaca, Morelos, Mexico, 31 August 1944, N.L.H. Krauss, taken on foliage of *Eupatorium adenophorum* or parnakani joe pie weed. Allotype female with same data except collection date 13 August 1944. Paratypes: three females with identical data except collection dates 10 August 1944, 15 August 1944, and 25 August 1944; male and female with same data except collection date only October 1944; male and four females, Taxco, Guerrero, Mexico, 22 August 1936, W.E. Stone; male, Cuernavaca, Mexico, October 1965, N.L.H. Krauss; male with same data except collection date 2 August 1944; male, Guelatao, Oaxaca, Mexico, 18 August 1969, L.A. Kelton (specimen in Canadian National Collection, Ottawa).

Specimens studied. Known only from types.

Notes. *C. roseifrons* is the only dark member of the genus that can be recognized on the basis of an easily observed external feature found in both sexes. Even though there is considerable variation in the degree and extent of the reddish tinting of the face, the facial coloration will serve to separate *C. roseifrons* from all congeners. The trivial name is from the Latin and means "rose-colored face." The aedeagus provides many distinguishing features. The most obvious of these are the shapes of the subflagellar process and the processes found on or near the apical portion of the shaft in right lateral view.

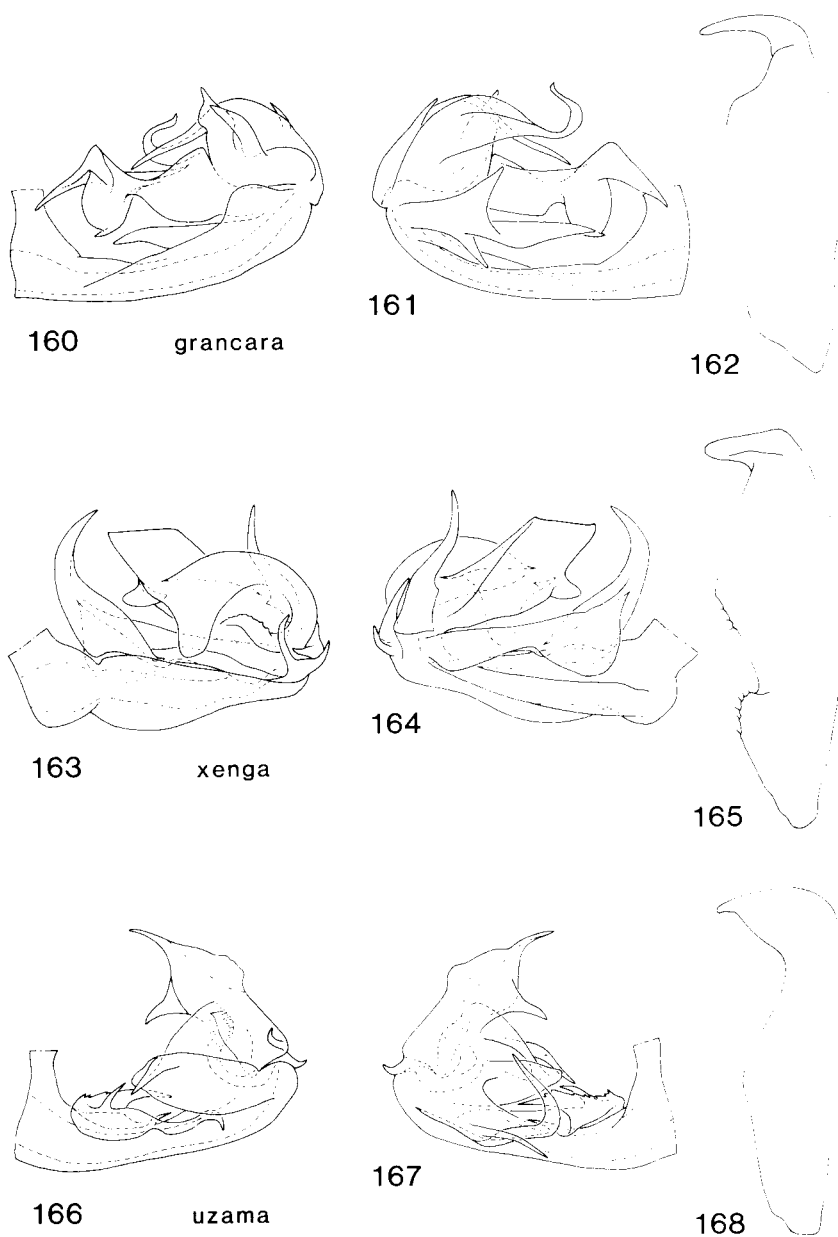
49. *Cedusa grancara*, new species
(Figs. 160-162)

Salient features. Length of male 4.5 mm, female unknown. Ground color of head and pronotum yellowish brown; middle portion of face, except for pale longitudinal midline, darkly infuscated; sides of head, except for pale antennae and antennal ledges, darkly infuscated; central portion of crown and pronotum lightly infuscated; mesonotum darkly fuscus; legs yellowish brown, posterior femora infuscated except at apices; forewings in reflected light, darkly infuscated.

Male genitalia. Right paramere in ventral view (Fig. 162) greatly narrowed in subapical region; apex with well-developed, inwardly directed hook. Aedeagus in left lateral view (Fig. 160) with two dissimilar, dorsally directed processes on side of flagellum in basal region, smaller process tapered to acute tip, larger process rounded subapically then tapered to acute tip; dorsal portion of flagellum with moderately long, slender, tapered process directed obliquely cephalad near apex; subflagellar process prominent and long, consisting of two large divisions joined by narrow stalk; both divisions subtriangularly convex on their dorsal margins and roundly convex on their ventral margins; proximal division of subflagellar process simple; distal division of subflagellar process with short, acute, cephalically directed process on ventral margin and much longer, tapered, distally pointed process on dorsal margin. Aedeagus in right lateral view (Fig. 161) similar to left lateral view but with tapered, apically acute, dorsally directed process at apex of shaft; side of flagellum with broadly based process that extends cephalad and narrows, its apical portion bent dorsally, then obliquely caudally, and finally dorsally at tip; large and prominent three-pronged process arising near apex of shaft; its long axis directed cephalad.

Type. Holotype male (USNM Collection), Cuernavaca, Morelos, Mexico, 14 August 1944, N.L.H. Krauss, ex foliage of *Eupatorium adenophorum* or parnakani joepieweed.

Specimens studied. Known only from holotype.



Figs. 160-168. Male genitalia. **160-162**, *C. grancara*, holotype. **163-165**, *C. xenga*, holotype. **166-168**, *C. uzama*, holotype. **160, 163, 166**, aedeagus in left lateral view. **161, 164, 167**, aedeagus in right lateral view. **162, 165, 168**, right paramere in ventral view.

Notes. *C. grancara* is a most distinctive species on the basis of many aedeagal characters. All of the following structural modifications are unique to this species: the upturned process that projects beyond the flagellar apex and is somewhat reminiscent of an uplifted elephant trunk, the large and mesally constricted subflagellar process with its apical elaborations, and the large and long three-pronged process that arises near the apex of the aedeagus.

50. *Cedusa xenga*, new species
(Figs. 163-165)

Salient features. Length of male 4.7-5.0 mm, female 5.0-5.4 mm. Ground color of head, pronotum, and legs brownish yellow or tawny; frons with pair of brownish stripes that converge at base and apex; central portion of crown lightly embrowned; pronotum darkened behind eyes and sometimes very slightly darkened on middle portions; mesonotum reddish brown with poorly defined, pale longitudinal stripe on each side of carinate midline; legs unmarked; forewings in reflected light, tinted lightly with pale reddish brown.

Male genitalia. Right paramere in ventral view (Fig. 165) with inner margin lobed in basal portion and subtriangularly convex just beyond midlength; apex flattened with stout, blunt, inwardly directed hook. Aedeagus in left lateral view (Fig. 163) with three acute, tapered, rather short processes or projections near juncture of shaft and flagellum; basal outline of flagellum broadly rounded, poorly defined, dorsally crenulate process near base; distal portion of flagellum subquadrately expanded with lobe at or near center of distal margin and slightly larger lobe at distoventral margin; subflagellar process prominent and nearly reaching base of aedeagus; its apical portion much enlarged, enlarged portion consisting of tapered, apically acute structure that curves caudad or obliquely caudad in distal half. Aedeagus in right lateral view (Fig. 164) similar to left lateral view but with three slender processes of different lengths arising at or near juncture of shaft and flagellum, longest process projects above dorsal margin of flagellum and bears short angulation on proximal margin in basal half; subflagellar process with broadly rounded lobe on ventral margin distally; lobe on right side and large hook on left side of subflagellar apex separated ventrally to straddle dorsal margin of shaft.

Types. Holotype male (USNM Collection), Mayport, Florida, August 1942, R.C. Barnes, light trap. Paratypes: male and two females, Sanford, Florida, 19 May 1927, E.D. Ball; male, Sanford, Florida, 21 May 1926, E.D. Ball; and male, Sanford, Florida, 20 October 1926, E.D. Ball.

Specimens studied. Known only from types.

Notes. *C. xenga* does somewhat resemble *C. inflata* (Ball) (Flynn and Kramer 1983:240, fig. 82) in the general outline of the flagellum, but *C. inflata* does not have a long subflagellar process and the apical hooks

of the parameres are larger and more acute apically. It also resembles *C. chuluota* Ball (Ibid:251, fig. 92), but *C. chuluota* does not have the distal portion of the flagellum subquadrately expanded and the apical hooks of the parameres are much smaller.

51. *Cedusa uzama*, new species
(Figs. 166-168)

Salient features. Length of male 4.2-4.8 mm, female 4.8-5.4 mm. Ground color of head and pronotum deeply fuscus to black; longitudinal midline of face, lateral margins of face and crown, antennae, antennal ledges, posterior and lateral margins of pronotum, yellowish brown; mesonotum fuscus to black; legs yellowish brown, femora and forelegs usually tinged with fuscus; forewings in reflected light, deep red-brown to black.

Male genitalia. Right paramere in ventral view (Fig. 168) with inner margin roundly convex near middle; distal portion broadly capitate with small, inwardly directed hook on inner margin at apex. Aedeagus in left lateral view (Fig. 166) near distal juncture of shaft and flagellum two short, tapered, recurved processes; upper portion of flagellum basally subquadrate with short angulation on side, dorsal margin with low subapical convexity, ventral margin with stout, tapered projection in distal half, extreme apex produced as slender, apically pointed extension; lower portion of flagellum long and irregularly oval, with ventrally directed, rather stout, tapered process subapically on or near dorsal margin; subflagellar process nearly reaching base of aedeagus, consisting of four caudally projecting processes, ventralmost process longest, somewhat undulated, with extreme apex downturned, other processes shorter and tapered to acute tips, uppermost of these processes with some fine denticles on its dorsal margin. Aedeagus in right lateral view (Fig. 167) similar to left lateral view but with two processes arising near middle of shaft, shorter process narrower, directed cephalad, and crossing base of longer process, longer process directed obliquely cephalad, then turning and directed obliquely caudad, terminating with sharply tapered tip.

Types. Holotype male (USNM Collection) and allotype female, Cuernavaca, Morelos, Mexico, 15 September 1944, N.L.H. Krauss, taken from foliage of *Eupatorium adenophorum* or parnakani joepieweed. Paratypes (all with identical data except collection dates): male and female, 14 August 1944; male, October 1944; single females, 13 September 1944, 15 September 1944, and 27 September 1944.

Specimens studied. Known only from types.

Notes. *C. uzama* can be recognized by the capitate apical portion of the right paramere and by the modifications of both the aedeagal flagellum and subflagellar process.

52. *Cedusa zantata*, new species
(Figs. 169-171)

Salient features. Length of male 3.6 mm, female unknown. Ground color of head, pronotum, and mesonotum dark mahogany and unmarked; legs brownish yellow; forewings in reflected light, dark mahogany.

Male genitalia. Right paramere in ventral view (Fig. 171) narrowed basally; inner margin roundly convex beyond midlength; sharp, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 169) at apex with very short acute process; flagellum irregularly oval in outline; slender, slightly undulated, moderately long, cephalically directed process near base of flagellum; dorsal margin of flagellum convexly rounded with subapical lanceolate process projecting cephalad; with lobe on both side and ventral margin of flagellum; apex of flagellum with bluntly subtriangular projection. Aedeagus in right lateral (Fig. 170) view similar to left lateral view but with moderately large, subquadrate process on distal portion of shaft, its proximal and distal dorsal angles produced and acute; slender, upright process overlapping distoventral angle of subquadrate process.

Types. Holotype male (USNM Collection), Mojinga Swamp, Canal Zone, Panama, 30 January 1952, F.S. Blanton. Paratypes: two males with data identical to that of holotype except collection dates 19 November 1951 and 17 June 1952.

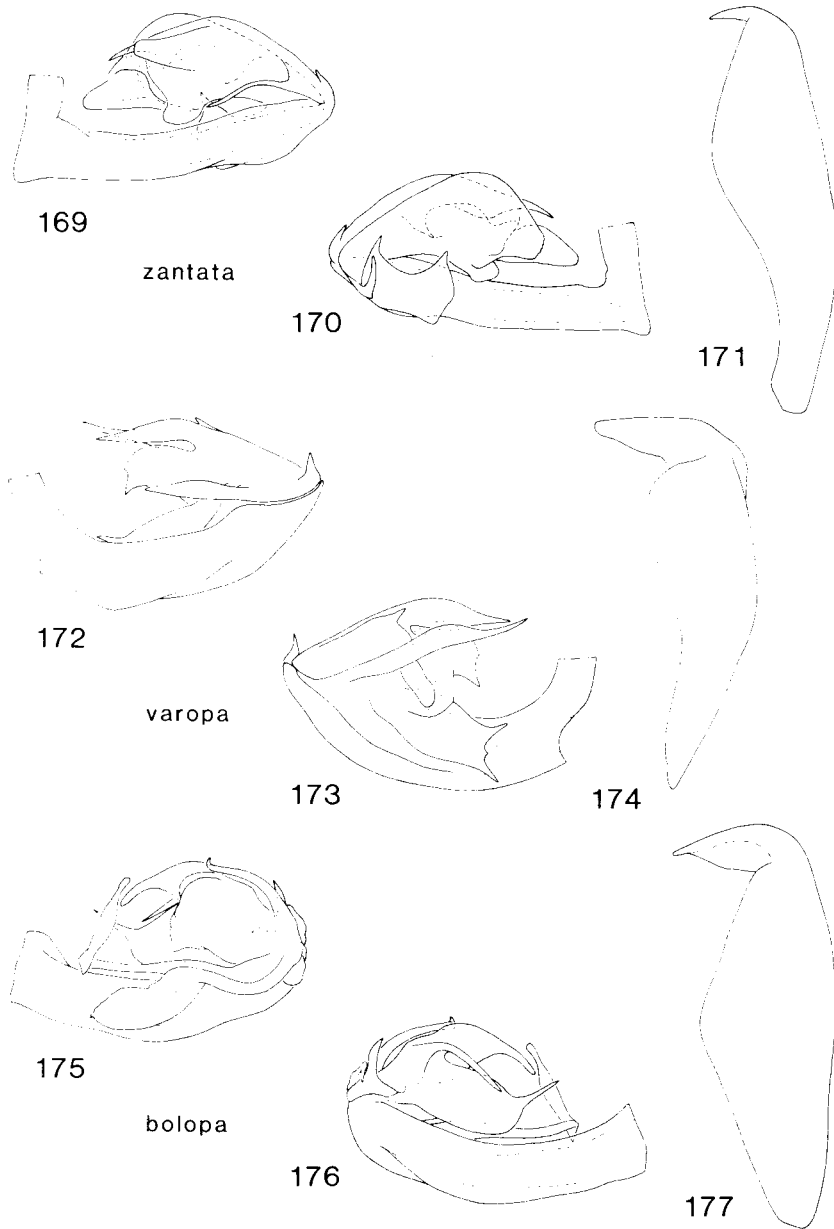
Specimens studied. Known only from types.

Notes. *C. zantata* can be recognized at once by the subquadrate structure on the distal portion of the shaft as observed in a right lateral view of the aedeagus and by the bluntly subtriangular projection at the flagellar apex.

53. *Cedusa varopa*, new species
(Figs. 172-174)

Salient features. Length of male 4.5 mm, female unknown. Ground color of head and pronotum dark red-brown; midline and lateral margins of face, anterior and lateral margins of crown, antennae, antennal ledges, posterior and lateral margins of pronotum, brownish yellow; mesonotum dark red-brown, almost black; vague, slightly paler, poorly defined patch on each side of midline near middle; legs brownish yellow; forewings in reflected light, very dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 174) with inner margin broadly and shallowly concave in basal half; large, stout, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 172) with basally broad, short, upright projection near apex of shaft; flagellum with cephalically directed, rather stout, tapered process on both



Figs. 169-177. Male genitalia. **169-171**, *C. zantata*, holotype. **172-174**, *C. varopa*, holotype. **175-177**, *C. bolopa*, holotype. **169, 172, 175**, aedeagus in left lateral view. **170, 173, 176**, aedeagus in right lateral view. **171, 174, 177**, right paramere in ventral view.

dorsal and ventral margins; apical portion of flagellum avicephaliform. Aedeagus in right lateral view (Fig. 173) similar to left lateral view but with long process arising on side of flagellum and extending obliquely cephalad, its dorsal margin concave distally producing slender and pointed apical portion; large, subquadrate structure arising near proximal juncture of shaft and flagellum, its dorsal ventral margins slightly and roundly convex, both dorsodistal and ventrodiscal angles produced as moderately long, acute projections; small tooth on distal margin between projections.

Type. Holotype male (USNM Collection), Petropolis, Brazil, December 1970, J. Maldonado C.

Specimens studied. Known only from holotype.

Notes. *C. varopa* can be distinguished from all of its congeners by a combination of characters that include the unusually stout hooks at the apices of the parameres, the distally avicephaliform flagellum, and the large subquadrate structure on the right side of the aedeagus.

54. *Cedusa bolopa*, new species (Figs. 175-177)

Salient features. Length of male 5.0 mm, female unknown. Ground color of head and pronotum red-brown, antennal ledges in part pale; mesonotum dark red-brown; legs yellowish brown; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 177) with inner margin subtriangularly convex; large, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 175) at or near apex with moderately long, slender, apically upturned process; upper portion of flagellum prolonged distally as slender downturned extension and with slender downturned process on its side; lower portion of flagellum somewhat rounded and prolonged distally as slender, apically acute extension; subflagellar process narrow, long, and bent dorsally in distal third; distal portion abruptly narrowed subapically; long process arising near apex of shaft, its basal half narrow and stalklike; its distal half elongated suboval with ventral margin roundly convex and dorsal margin indented near middle. Aedeagus in right lateral view (Fig. 176) similar to left lateral view but with two rather short additional processes near apex of shaft and moderately long, distally decurved process on side of upper portion of flagellum.

Type. Holotype male (Canadian National Collection, Ottawa), Bahado, Parana, Brazil, 14 February 1972, E.G. and E.A. Munroe.

Specimens studied. Known only from holotype.

Notes. *C. bolopa* has two aedeagal modifications found in no other species of *Cedusa*. These are the slender and distally bent subflagellar

process and the elongated process on the left side of the shaft that is narrowed and stalked in its basal half and enlarged and suboval in its distal half.

55. *Cedusa vidola*, new species
(Figs. 178-180)

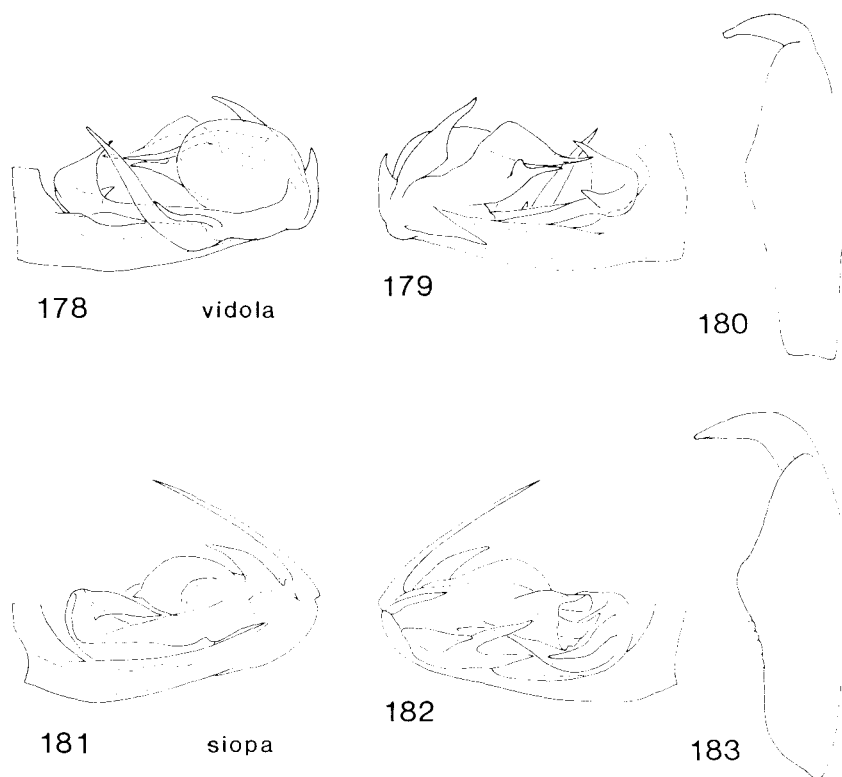
Salient features. Length of male 3.6-3.8 mm, female unknown. Ground color of head and pronotum red-brown to dark red-brown; longitudinal midline and lateral margins of face, edges of antennal ledges and antennae, anterior and lateral margins of crown, and posterior and lateral edges of pronotum, yellowish brown; mesonotum very dark red-brown; legs yellowish brown; forewings in reflected light, very dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 180) with inner margin convex near middle; somewhat narrowed subapically; large, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 178) with variable roundly inflated area covering flagellar base; flagellum avicephaliform with open "beak" at apex; slender, tapered, apically acute process projecting cephalically from behind inflated area; subflagellar process long, nearly reaching base of aedeagus, its apical portion enlarged with sharply tapered extensions on dorsal margins of both left and right side; side of shaft near midlength with one small slender process and one large and much longer, tapered process. Aedeagus in right lateral view (Fig. 179) similar to left lateral view but with three processes arising on or near base of flagellum; dorsodistal margin of flagellum convex, apical portion consisting of separated, tapered, acute projections.

Types. Holotype male (USNM Collection), Nueva Gorgano, Panama, 16 September 1952, F.S. Blanton. Paratype males: two, Palm Beach, Panama, 17 September 1952, F.S. Blanton; one, Rio Las Lajas near Coronado Beach, Panama, 17 September 1952, F.S. Blanton; one, Espino, Panama, 18 September 1952, F.S. Blanton; and one, Port Aguadulce, Panama, 21 November 1952, F.S. Blanton.

Specimens studied. In addition to the types, one male labeled only Panama, 10 November 1952, F.S. Blanton.

Notes. *C. vidola* appears to be closely related to *C. australis* (Metcalf) (Flynn and Kramer 1983:191, fig. 48). The two species share the same general outline of the aedeagus; but the apices of the flagella are different, and *C. australis* lacks the two processes near the middle of the left side of the aedeagal shaft that are found in *C. vidola*.



Figs. 178-183. Male genitalia. **178-180**, *C. vidola*, holotype. **181-183**, *C. siopa*, holotype. **178, 181**, aedeagus in left lateral view. **179, 182**, aedeagus in right lateral view. **180, 183**, right paramere in ventral view.

56. *Cedusa siopa*, new species
(Figs. 181-183)

Salient features. Length of male 4.1 mm, female unknown. Ground color of head and pronotum pale brownish yellow; face with pair of brown longitudinal stripes that merge dorsally near coronal area; middle portion of crown partly embrowned; sides of head below eyes, except antennae and antennal ledges, embrowned; pronotum embrowned behind each eye; mesonotum uniformly dark red-brown; legs pale brownish yellow; forewings in reflected light, dark red-brown.

Male genitalia. Right paramere in ventral view (Fig. 183) with inner margin convex near middle; large, well-developed, inwardly directed hook at apex. Aedeagus in left lateral view (Fig. 181) at apex with long, slender, tapered process directed obliquely cephalad above flagellum; anterior to long process, minute tooth and shorter, stouter, distally tapered process; upper portion of flagellum oval with short tooth at its

apex; lower portion of flagellum much longer than upper portion, transverse with distal area bearing stout, broadly tapered, caudally directed, acute process on or near dorsal margin at subapex. Aedeagus in right lateral view (Fig. 182) similar to left lateral view but with slender, acute, rather short process near apex; below slender process, stout subtriangular process and moderately broad, distally forked process; distalmost portion of flagellum with two rather stout, acute processes, one directed caudad and the other directed obliquely cephalad.

Types. Holotype male (USNM Collection), Tamazunchale, San Luis Potosi, Mexico, 7 March 1946, J.S. Caldwell. Paratype males: four with data identical to that of the holotype; one from same locality except collection date 25 September 1941 and collectors DeLong, Caldwell, and Plummer.

Specimens studied. Known only from types.

Notes. *C. siopa* closely resembles *C. californica* (Van Duzee) on the basis of coloration. Both have essentially a pale head and pronotum that contrasts sharply with the dark red-brown mesonotum and forewings. Details of the parameres and aedeagus are quite different in the two species; compare *C. siopa* (Figs. 181-183) and *C. californica* (Flynn and Kramer 1983:203, fig. 53).

Checklist of the *Cedusa* spp. described in this study with country records and state records for the United States

- | | |
|---|---|
| 1. <i>andara</i> , Panama. | 29. <i>ozda</i> , Mexico. |
| 2. <i>aziza</i> , Mexico. | 30. <i>pacuta</i> , Brazil. |
| 3. <i>belma</i> , Panama. | 31. <i>pipsewa</i> , Panama. |
| 4. <i>bolopa</i> , Brazil | 32. <i>poochia</i> , Costa Rica. |
| 5. <i>carropia</i> , Panama. | 33. <i>quimata</i> , Mexico. |
| 6. <i>catasia</i> , Panama. | 34. <i>quinteca</i> , Dominican Republic. |
| 7. <i>dilbata</i> , Panama. | 35. <i>quixoa</i> , Costa Rica, Panama. |
| 8. <i>drilda</i> , Guatemala. | 36. <i>reota</i> , Panama. |
| 9. <i>edox</i> , Panama. | 37. <i>roseifrons</i> , Mexico. |
| 10. <i>enosala</i> , Panama. | 38. <i>senbara</i> , Panama. |
| 11. <i>feborá</i> , Panama. | 39. <i>siopa</i> , Mexico. |
| 12. <i>flynni</i> , Argentina. | 40. <i>tuvaga</i> , Panama. |
| 13. <i>gonuga</i> , Panama. | 41. <i>ulora</i> , Ecuador. |
| 14. <i>grancara</i> , Mexico. | 42. <i>unsera</i> , Panama. |
| 15. <i>hampora</i> , Panama. | 43. <i>uzama</i> , Mexico. |
| 16. <i>hyola</i> , Mexico. | 44. <i>varopa</i> , Brazil. |
| 17. <i>impada</i> , Panama. | 45. <i>vidola</i> , Panama. |
| 18. <i>isinara</i> , Mexico. | 46. <i>widisca</i> , USA: Texas. |
| 19. <i>janola</i> , Costa Rica, Panama. | 47. <i>wontula</i> , Panama. |
| 20. <i>jarata</i> , Mexico. | 48. <i>woodyga</i> , Panama. |
| 21. <i>jinwista</i> , Guyana. | 49. <i>xenga</i> , USA: Florida. |
| 22. <i>kalala</i> , Mexico. | 50. <i>xipola</i> , Panama. |
| 23. <i>kinoxá</i> , Panama. | 51. <i>xumara</i> , Ecuador. |
| 24. <i>lumeda</i> , Panama. | 52. <i>yarosa</i> , Argentina. |
| 25. <i>marlota</i> , Panama. | 53. <i>yipara</i> , Brazil. |
| 26. <i>nortoma</i> , Panama. | 54. <i>youza</i> , Panama. |
| 27. <i>noxora</i> , Mexico. | 55. <i>zantata</i> , Panama. |
| 28. <i>olasca</i> , Panama | 56. <i>zaxoza</i> , USA: Florida. |

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