

New species of *Curtara*, *Polana* and *Acuera* (Homoptera: Cicadellidae, Gyponinae) from Panama, Peru, Bolivia and Venezuela

DWIGHT M. DELONG and HENK WOLDA

DeLong, D. M. & Wolda, H.: New species of *Curtara*, *Polana* and *Acuera* (Homoptera: Cicadellidae, Gyponinae) from Panama, Peru, Bolivia and Venezuela. Ent. scand. 13: 301-311. Lund, Sweden 15 September 1982. ISSN 0013-8711.



Ent. scand.

The following 15 species of Gyponinae are described: *Curtara exilia* n.sp., *C. breva* n.sp., *C. vurla* n.sp., *C. magna* n.sp., *C. kula* n.sp., *C. estribii* n.sp., *C. gatuna* n.sp., (all from Panama), and *C. subrufa* n.sp. (Peru). *Polana docera* n.sp., *P. tinae* n.sp., *P. diversita* n.sp., *P. julna* n.sp., (all from Panama), *P. clarita* n.sp. (Venezuela), *Acuera rana* n.sp. (Panama), and *A. luhea* n.sp. (Panama).

D. M. DeLong, Dept. Ent., Ohio State Univ., 1735 Neil Ave., Columbus, Ohio 43210, U.S.A.

H. Wolda, Smithsonian Inst., Trop. Res. Inst. Panama, Apo Miami, FLA, 34002, U.S.A.

A synopsis of the genus *Polana* DeLong was published by DeLong & Freytag (1972). The same authors treated the genus *Acuera* DeLong & Freytag (1974) and the genus *Curtara* DeLong & Freytag (1976). Eight species of *Curtara*, 5 species of *Polana* and 2 species of *Acuera* are described at this time. Most of the material treated was collected by the junior author and his associates in Panama.

1. *Curtara exilia* n.sp. Figs. 1-5.

Type area: Panama, Las Cumbres.

Type material: *Holotype* male, Panama, Las Cumbres, 9-X-1976, at light, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Retusana* DeLong & Freytag. Differs from *C. cumbresa* DeL. & Wol. by male genitalia, especially the styles.

Etymology: *exilia* — with elongate, slender form.

Description

Length of male 8 mm., female unknown. Crown more than 1/2 as long at middle as width between eyes at base. Body long and narrow, resembling a species of *Polana* in general appearance. Color, crown dull yellow. Pronotum

dull yellowish peppered on disc with brown punctate spots. Two round black spots on front of pronotum, behind ocelli. Two faint black spots behind eyes at half length of pronotum. Scutellum dull yellowish. Forewings yellowish subhyaline, with a large black spot on corium of each wing. Forewing with numerous black spots especially on clavus and on posterior portion of wing.

Male genital plates 4× as long as width at middle, apices narrow, bluntly pointed. Style with apex turned abruptly dorsally, narrowed and produced, 1/4 length of blade. Aedeagal shaft slender, elongate, with 2 long apical processes extending more than 2/3 distance to base. Parameres very slender, extending 4/5 distance to apex. Pygofer narrowed and truncate at apex.

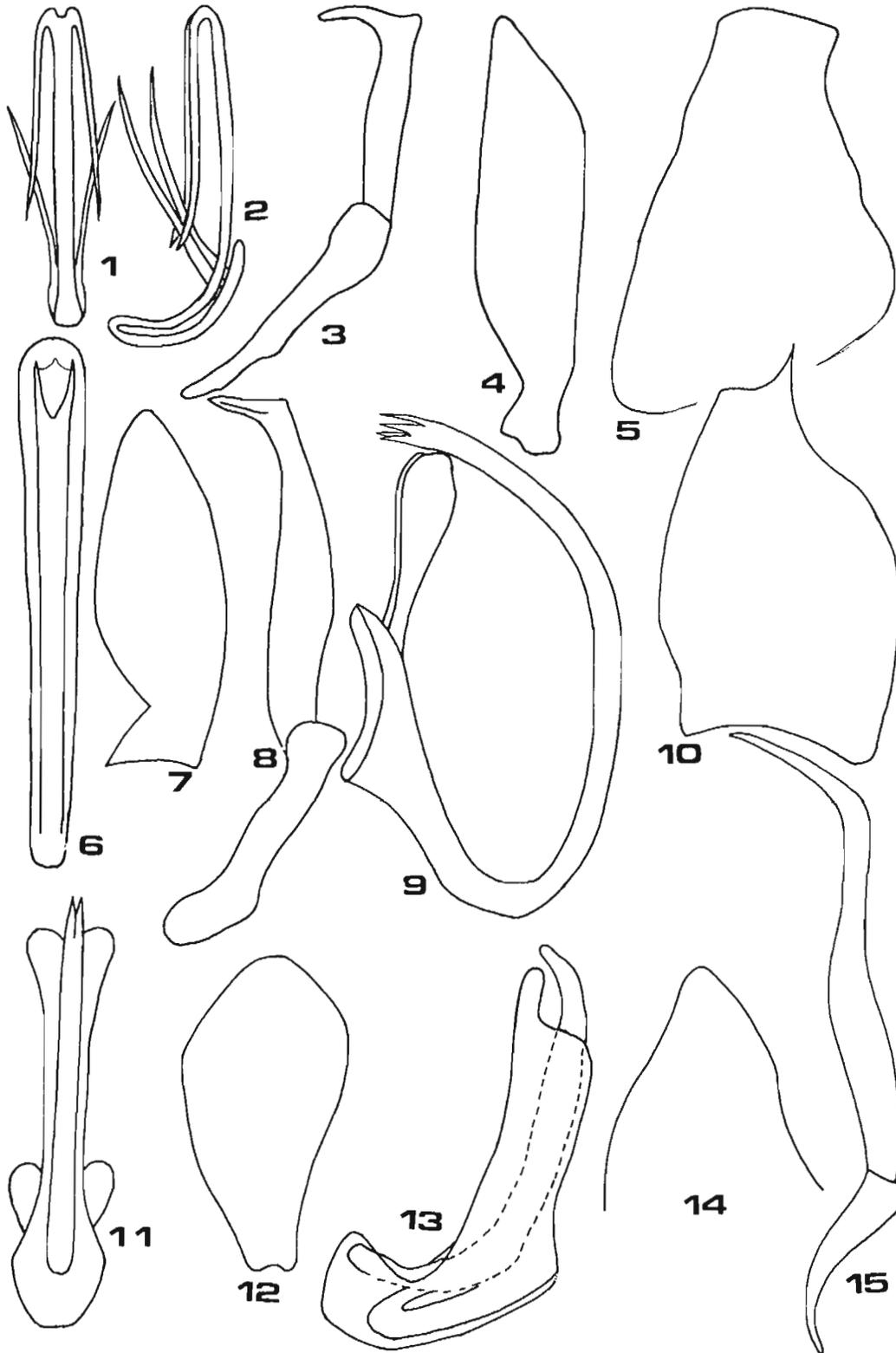
2. *Curtara breva* n.sp. Figs. 6-10.

Type area: Panama, Barro Colorado.

Type material: *Holotype* male, Panama, Barro Colorado, 20-IV-27 at light, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Curtara* and differs from *C. convella* DeL. by ♂ genital style especially.

Etymology: From latin brevis = short, alluding to the very short parameres.



Description

Length of male 10.5 mm, female unknown. Crown broadly rounded, twice as wide at base between eyes as median length. Margin thin, upturned. Color cream tinged with reddish brown. Pronotum reddish brown with a pale brownish ring around disc, reaching almost to anterior margin. Scutellum reddish brown with 2 minute white spots just anterior to apical angle. Forewings reddish brown, veins prominent only on smoky apical portion.

Male genital plates $2\frac{1}{2}\times$ as long as median width, apices narrowed, rounded. Style broadened by ventral, convex curvature at $\frac{1}{3}$ its length. Apical portion bent abruptly dorsally, apex bluntly pointed. Aedeagal shaft long, slender, curved, apex blunt, bearing several spine-like processes. Parameres very short, about $\frac{1}{4}$ length of shaft, embrowned and rounded apically. Shaft curved so that parameres reach apex of aedeagus. Pygofer narrowed apically, curved on dorsal surface, forming a narrow caudal apex with a pointed spine-like process dorsocaudally.

3. *Curtara vurla* n.sp.

Figs. 11–15.

Type area: Panama, Chiriqui, Dst. Renocimento, Santa Clara 4000'.

Type material: *Holotype* male, Panama, Chiriqui Dst. Renocimento, Santa Clara 4000' 3.5-VII-'76 at light, leg. D. Engleman in coll. DeLong.

Diagnosis: Placed in subgenus *Curtara*. Differs from *C. convella* DeL. by the different ♂ genitalia.

Etymology: Vurla is the name of a small stream in Peru where the senior author has been collecting.

Description

Length of male 10 mm, female unknown. Crown broadly rounded, more than $0.5\times$ as long at middle as basal width between eyes. Color, crown pale brown with a yellowish spot behind each ocellus. Pronotum with anterior marginal area pale brown with black irregular markings. Disc yellow with a median brown spot on posterior $\frac{2}{3}$ of disc. Scutellum brown with apical

angle white. Forewings pale brown subhyaline, with dark brown and yellow markings, the most prominent of which is a yellow spot at middle of clavus on commissure and dark brown spots on clavus.

Male genital plates less than $2\times$ as long as width at middle, apices broad, rounded. Style with blade narrowed apically, apical fourth bent dorsocaudally, tapered, sharply pointed. Aedeagal shaft bent dorsally, short, apex blunt. Parameres forming a sheath, reaching almost to apex of shaft and almost completely enclosing shaft. Apices of parameres with finger-like projections on dorsal margin. Pygofer narrowed caudally and bluntly pointed.

4. *Curtara magna* n.sp.

Figs. 16–20.

Type area: Panama, Colon Prov., Sta. Rita Ridge.

Type material: *Holotype* male, Panama, Colon Prov. Sta. Rita Ridge 18,26-VI-'76, at light, leg. Englemann, Thurman in coll. DeLong.

Diagnosis: Placed in subgenus *Ardasoma*. Differs from *C. arda* by the different male genital structures.

Etymology: *magna* — with a large body.

Description

Length of male 15 mm, female unknown. Crown more than $\frac{1}{3}$ longer at middle than width between eyes at base. Margin of crown thin. Color, crown and pronotum brownish yellow. Forewings dark brown mottled with white. A large white anteapical area on costa with small brown markings.

Male genital plates more than $4\times$ as long as width at middle, apices broadly rounded. Style broadened at middle, then tapered to apex, which curves dorsally, is pointed at apex and has a slight enlargement on ventrocaudal curved portion. Aedeagal shaft stout, with a pair of short apical processes which extend laterally and basally. A pair of larger subapical processes which arise ventrally extend laterobasally more than $\frac{1}{3}$ distance to base. Parameres short, slender and pointed apically, extending to $\frac{3}{4}$ length of

Figs. 1–5. *Curtara exilia* n.sp. — 1. Aedeagus, ventrally. — 2. Aedeagus, laterally. — 3. Style, laterally. — 4. Plate, ventrally. — 5. Pygofer, laterally. — Figs. 6–10. *Curtara breva* n.sp. — 6. Aedeagus, ventrally. — 7. Plate, ventrally. — 8. Style, laterally. — 9. Aedeagus, laterally. — 10. Pygofer, laterally. — Figs. 11–15. *Curtara vurla* n.sp. — 11. Aedeagus, ventrally. — 12. Plate, ventrally. — 13. Aedeagus, laterally. — 14. Pygofer, laterally. — 15. Style, laterally.

shaft. Pygofer bearing a thick spine which extends inwardly at apex of genital capsule on ventrocaudal margin.

5. *Curtara kula* n.sp.

Figs. 21–25.

Type area: Panama, Barro Colorado.

Type material: Holotype male, Panama, Barro Colorado, 3-IX-1975 leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Curtara*. Differs from *C. torquara* DeL. by the male genitalia.

Etymology: *Kula* is derived from Kulamann, a native tribe in the Philippines.

Description

Length of male 7.5 mm, female unknown. Crown more than 1/2 as long at middle as basal width between eyes. Color brown. Pronotum with dark brown punctate spots. Scutellum paler brown with dark brown basal angles. Forewings pale brown subhyaline, with two rows of dark brown spots, consisting of four and six respectively across clavus and corium at approximately 1/3 and 2/3 length of clavus.

Male genital plates 4× as long as width at middle, apices broadly rounded. Style slightly broadened at middle, then tapered to a narrow apex which curves dorsally. Aedeagal shaft bearing a pair of short, apical processes which curve laterally. Parameres extending both basally and apically, apices blunt, not reaching apex of aedeagus. Pygofer broadly rounded apically.

6. *Curtara estribii* n.sp.

Figs. 26–30.

Type area: Panama, Chiriqui, Fortuna el. 1050 m.

Type material: Holotype male, Panama, Chiriqui, Fortuna el. 1050 m. 4-V-1978, 8°, 44' N; 82° 15' W, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Curtara*. Differs from *C. xingus* Del & Trph., which it resembles superficially, by the different male genitalia.

Etymology: We take pleasure in naming this species for Miguel Estribi of the Smithsonian Tropical Research Institute.

Description

Length of male 8.5 mm, female unknown. Crown produced and broadly rounded, almost 2/3 as long at middle as basal width between eyes. Color pale green tinged with brown. Forewings with three brown spots. One on

anterior portion of corium, one at middle of claval suture and a third apex of claval suture.

Male genital plates 3× as long as width at middle, apices narrowed, rounded. Style with blade broadened near base by curvature on dorsal margin. Apex slender, sharp pointed, extending dorsally. Aedeagal shaft bearing a pair of apical processes which extend basally 1/4 distance to base, and a pair of minute spines which extend caudally. Parameres < 1/2 length of shaft, extending caudad. Pygofer narrowed apically and broadly, bluntly pointed.

7. *Curtara gatuna* n.sp.

Figs. 31–35.

Type area: Panama, Barro Colorado.

Type material: Holotype male, Panama, Barro Colorado, 20-IX-1975, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Curtara*. Differs from *C. diagonalis* by the male genital structures, both aedeagus and styles.

Etymology: Named after Lake Gatun which surrounds Barro Colorado Island, Panama.

Description

Length of male 8 mm, female unknown. Crown short, broadly rounded, >2× as wide between eyes at base as median length. Color, crown pale yellowish, a small black spot behind each ocellus. Pronotum pale yellow, a small dark brown spot behind each eye, 1/2 of pronotum. disc with dark brown stipple. Scutellum pale brownish with dark brown basal angles. Forewings dull whitish, veins pale brown, with pale brown irregular blotches between veins.

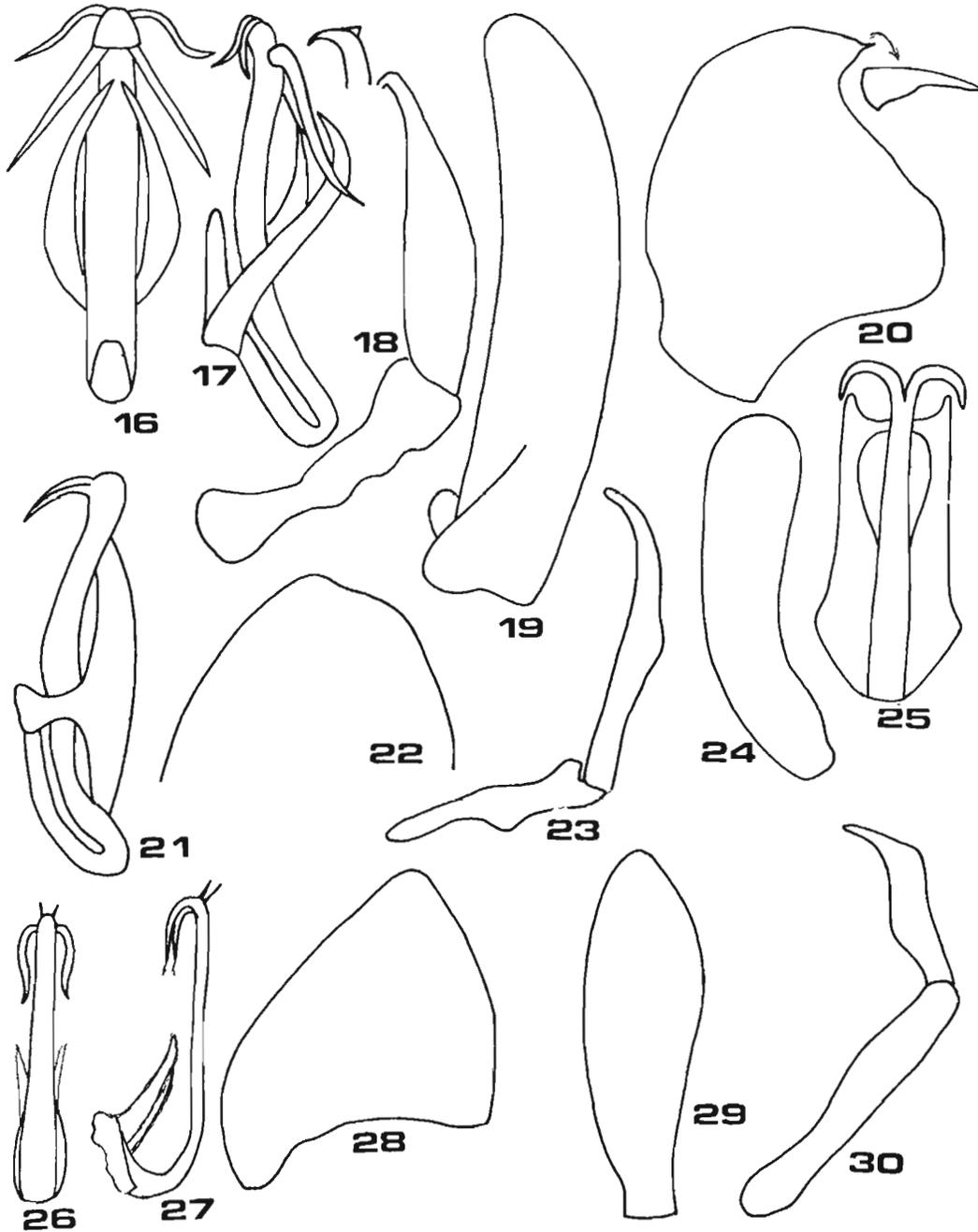
Male genital plates long and slender, about 4× as long as width at middle, apices rounded. Style broadened at middle with a convex bulge on dorsal margin, then concavely excavated dorsally to form a pointed apex which extends caudally. Aedeagal shaft with a slender process extending from the apex 1/4 of shaft beyond its apex. Parameres narrowed at 2/3 their length, extending to apex of shaft. Apex of pygofer rounded.

8. *Curtara subrufa* n.sp.

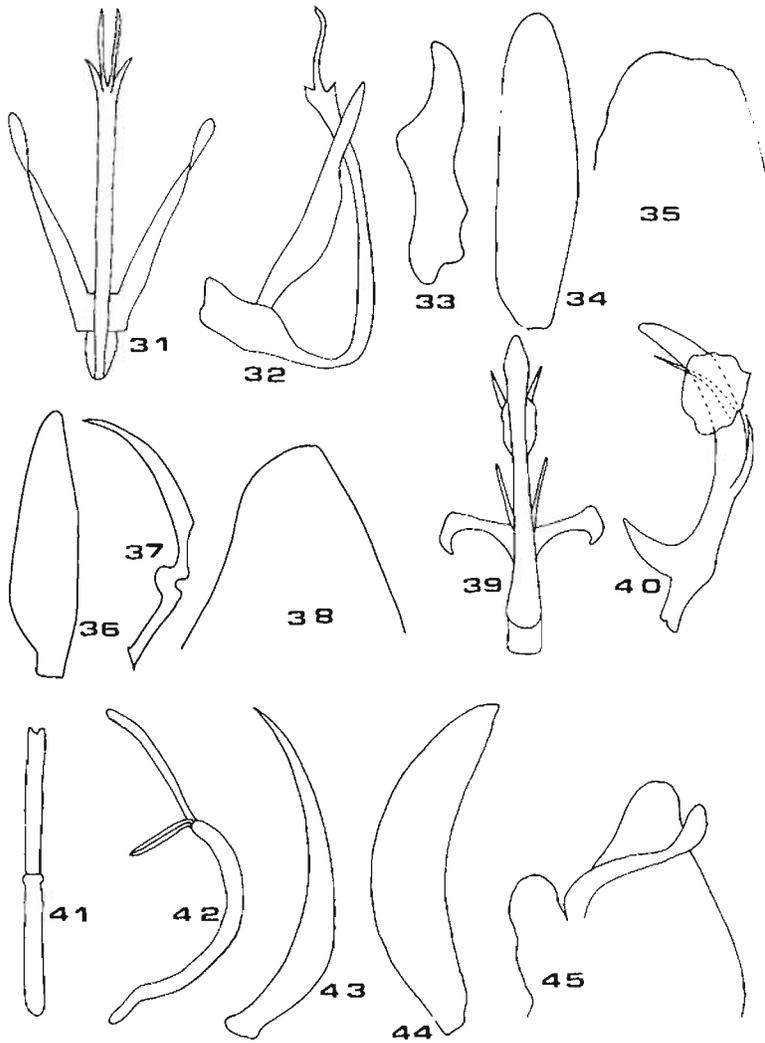
Figs. 36–40.

Type area: Peru, Estancia, Naraujal, San Ramon.

Type material: Holotype male, Peru, Estancia, Naraujal, San Ramon 1000 m. Dep. Junin 20–27-VII-'65, leg. P. & B. Wygodzinsky in coll. American Museum.



Figs. 16–20. *Curtara magna* n.sp. — 16. Aedeagus, ventrally. — 17. Aedeagus, laterally. — 18. Style, laterally. — 19. Plate, ventrally. — 20. Pygofer, laterally. — Figs. 21–25. *Curtara kula* n.sp. — 21. Aedeagus, laterally. — 22. Pygofer, laterally, apical portion. — 23. Style, laterally. — 24. Plate, ventrally. — 25. Aedeagus, ventrally. — Figs. 26–30. *Curtara estribii* n.sp. — 26. Aedeagus, ventrally. — 27. Aedeagus, laterally. — 28. Pygofer, laterally. — 29. Plate, ventrally. — 30. Style, laterally.



Figs. 31–35. *Curtara gatuna* n.sp. — 31. Aedeagus, ventrally. — 32. Aedeagus, laterally. — 33. Style, laterally. — 34. Plate, ventrally. — 35. Pygofer, laterally, apical portion. — Figs. 36–40. *Curtara subrufa* n.sp. — 36. Plate, ventrally. — 37. Style, laterally. — 38. Pygofer, laterally. — 39. Aedeagus, ventrally. — 40. Aedeagus, laterally. — Figs. 41–45. *Polona docera* n.sp. — 41. Aedeagus, ventrally. — 42. Aedeagus, laterally. — 43. Style, laterally. — 44. Plate, ventrally. — 45. Pygofer, laterally, apical portion.

Diagnosis: Placed in subgenus *Sinchora* DeLong. Differs from *C. picchua* DeL. by the different male genital structures.

Etymology: *subrufa* — brown with reddish tint.

Description

Length of male 12 mm, female unknown. Crown well rounded, $>2\times$ as wide between eyes at base as median length. Margin thick, ocelli closer to eyes than to median line of crown. Color, crown brown with a round black spot at base behind each ocellus. Pronotum brown, disc darker brown, a row of black spots or elongate marks, posterior to anterior margin and behind eyes. Scutellum brown with two proximal black spots at center and a large white spot at apex. Forewings mottled with white, dark brown and pale brownish spots.

Male genital plates $3\frac{1}{2}\times$ as long as width at middle, apices narrowed, bluntly pointed. Style with blade slender, gradually curved dorsally, apex pointed. Aedeagal shaft bearing a pair of short, lateral spines $\frac{1}{6}$ length of shaft which arise at $\frac{1}{3}$ length of shaft. A pair of flat, thin, leaf-like structures arise laterally at $\frac{2}{3}$ length of shaft and conceal a longer pair of spines which arise at middle of shaft and extend caudally. Pygofer narrowed apically and rounded.

9. *Polana docera* n.sp.

Figs. 41–45.

Type area: Panama, Chiriqui, Boquete, 1250 m.

Type material: *Holotype* male. Panama, Chiriqui, Boquete 1250 m. 25-XII-1975, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Nihilana* DeLong & Freytag. Differs from *P. bona* DeL. & Frey. by the male genitalia.

Etymology: *docera* — fine appearance.

Description

Length of male 9 mm, female unknown. Crown almost $2\times$ as wide at base between eyes as median length. Color, crown, pronotum and scutellum reddish brown with darker brown mottling. Forewings dark brown subhyaline with black spots at apex of claval veins at commissure and on corium. Apex of wings smoky.

Male genital plates elongate, $4\times$ as long as width at middle, apices pointed. Style with blade long, curved, gradually narrowed from base to a slender, pointed apex. Aedeagal shaft slender

with a pair of proximal, slender processes bent dorsally at right angles at $\frac{1}{2}$ of shaft and a more slender prolongation of shaft where processes arise. Terminus of extended shaft with a pair of curved spines. Pygofer with a bluntly pointed apex and bearing a dorsal pygofer spine which is curved apically.

10. *Polana tinae* n.sp.

Figs. 46–50.

Type area: Panama, Barro Colorado.

Type material: *Holotype* male, Panama, Barro Colorado, 19-V-1976 at light, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Polana*. Differs from *P. fusconotata* (Osb.) by the different male genitalia.

Etymology: We take pleasure in dedicating this species to Mrs. Tina Wolda.

Description

Length of male 6.8 mm, female unknown. Crown short and broad, broadly rounded, $2\frac{1}{2}\times$ as broad as median length, appearing parallel margined. Color, crown and pronotum brown. A few dark markings on anterior margin of pronotum, mostly behind eyes. Scutellum brown, basal angles dark brown. Forewings brownish subhyaline, a smoky spot on costa at $\frac{2}{3}$ its length, apex of wing smoky. Veins dark brown.

Male genital plates $3\times$ as long as width at middle, apices broadly rounded, almost truncate. Style with blade slender, bearing a transverse head-like structure apically, pointed dorsally and rounded on ventral margin. Aedeagal shaft roundly broadened on basal $\frac{1}{2}$, bearing a pair of apical processes, more than $\frac{1}{2}$ length of shaft which extend basally and laterally. Pygofer narrowed and bluntly pointed caudally.

11. *Polana diversita* n.sp.

Figs. 51–55.

Type area: Panama, B.C.I.

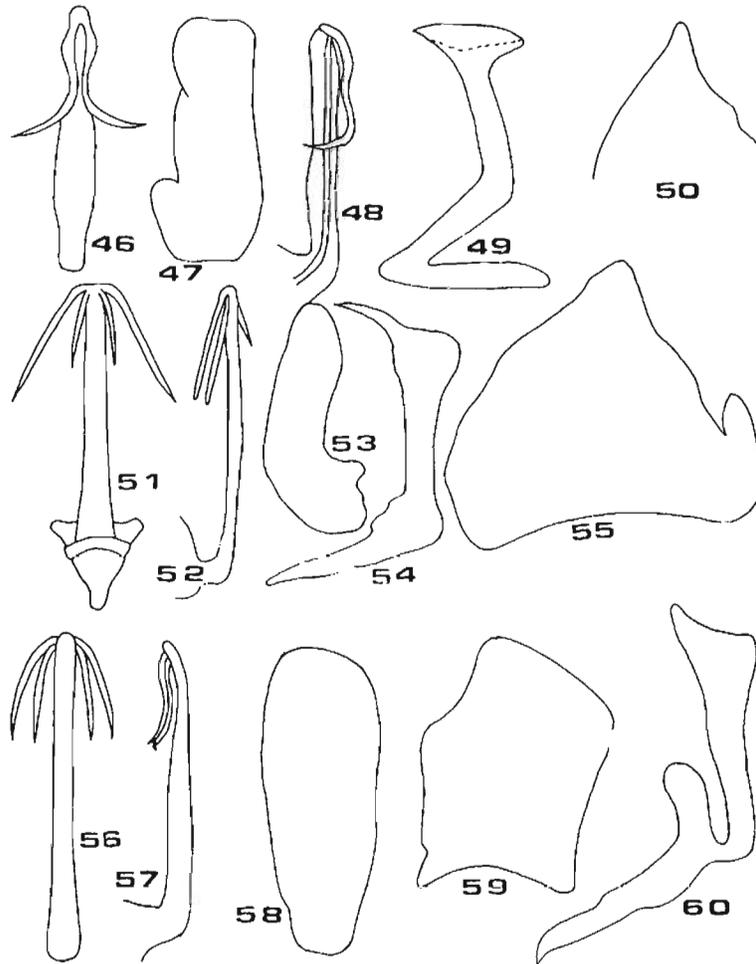
Type material: *Holotype*, male. Panama, B.C.I., I.S.M. 24-VI-76, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Polana*. Differs from *P. julna* DeL. by the male genital structures.

Etymology: *diversita* — diversity of structure.

Description

Length of male 7 mm, female unknown. Crown short and broadly rounded, $\frac{2}{5}$ as long at



Figs. 46-50. *Polana tinae* n.sp. — 46. Aedeagus, ventrally. — 47. Plate, ventrally. — 48. Aedeagus, laterally. — 49. Style, laterally. — 50. Pygofer, laterally, apical portion. — Figs. 51-55. *Polana diversita* n.sp. — 51. Aedeagus, ventrally. — 52. Aedeagus, laterally. — 53. Plate, ventrally. — 54. Style, laterally. — 55. Pygofer, laterally, apical portion. — Figs. 56-60. *Polana julna* n.sp. — 56. Aedeagus, ventrally. — 57. Aedeagus, laterally. — 58. Plate, ventrally. — 59. Pygofer, laterally, apical portion. — 60. Style, laterally.

middle as width between eyes at base. Color. crown black. Pronotum with anterior and lateral portions yellow, disc and posterior margin black. Scutellum yellow. Forewings black, costal area broadly yellow, apical portion black.

Male genital plates 3× as long as width at middle, apices narrowed, rounded. Style with apical 1/4 of blade enlarged and bearing a spine-

like structure on dorsocaudal margin which extends caudolaterally. Aedeagus bearing a long and a short spine, each side, which extend basally. The long outer spines are almost 1/2 length of shaft. The inside shorter spines are about 1/3 length of shaft. Pygofer tapered and bluntly pointed apically.

12. *Polana julna* n.sp.
Figs. 56–60.

Type area: Panama, Barro Colorado.

Type material: *Holotype*, male. Panama. Barro Colorado, 17-X-1977 at light, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Polana*. Differs from *P. fusconotata* (Osb.) by the male genitalia.

Etymology: *julna* is the name of a small town in Chile where the senior author has been collecting.

Description

Length of male 7 mm, female unknown. Crown short, broadly rounded, about 2/5 as long at middle as width between eyes at base. Color, crown, pronotum and scutellum dull yellow, a prominent round black spot behind each eye at 1/3 length of pronotum. Forewings yellowish subhyaline, veins brown, brown spots at base of forewing, on cross veins of corium, and on clavus at apices of 1st and 2nd claval veins.

Male genital plates 3× as long as width at middle, broadened apically, apices broadly rounded. Style with blade gradually broadened apically. Apical portion triangular with dorsal pointed portion slightly produced and rounded, ventral heel-like portion almost right angled. Aedeagal shaft slender, bearing a pair of processes, each side, more than 1/3 length of shaft, directed basad. Pygofer with apex broadly rounded.

13. *Polana clarita* n.sp.
Figs. 61–65.

Type area: Venezuela, Mt. Duida.

Type material: *Holotype* male, Venezuela, Mt. Duida, 5-III-1929, leg. Tate in coll. American Museum, No. 837. Ac. 29500. — *Paratype* female same as holotype.

Diagnosis: Placed in subgenus *Polanana*. Similar to *P. melalbida* DeL., differs by the male genitalia as illustrated.

Etymology: *clarita* — with distinct genital structures.

Description

Length of male 7.5 mm, female 8.5 mm. Crown broadly rounded, 2× as wide at base between eyes as median length. Ocelli closer to eyes than to median line. Color, dull yellowish green, a small brown spot at apex of 1st and 2nd claval veins.

Female 7th sternum with posterior margin broadly, slightly, concavely rounded.

Male genital plates 3 1/2× as long as width at middle, apices rounded. Style blade narrowed and bent sharply dorsally at 3/4 its length, with a spine extending ventrally at point of deflection; apical portion slender, apex pointed. Aedeagal shaft broad at base, curved gradually dorsally and tapered to a narrow blunt apex. Pygofer narrowed apically and rounded.

14. *Acuera rana* n.sp.
Figs. 65–70.

Type area: Bolivia, San Esteban, Mururina, 49 km. N. Santa Cruz.

Type material: *Holotype* male, Bolivia, Dept. of Santa Cruz, Prov. San Esteban, Mururina, 49 km. N. Santa Cruz., 1120 ft. 2-X-1959, leg. R. B. Cummings, in coll. DeLong.

Diagnosis: Placed in subgenus *Parcana* DeLong & Freytag. Differs from *A. nama* by the male genitalia.

Etymology: *rana* — frog-like; superficially resembling a Cercopid.

Description

Length of male 8.5 mm, female unknown. Crown with thin produced margin more than 1 1/2× as broad between eyes at base as median length. Color, crown pale brown with a black spot at apex, a small black spot at base, each side behind ocelli, and a black median line. Pronotum pale brown with a black spot behind each eye, and numerous punctate spots. Scutellum pale brown, basal angles darker brown. Forewings white, subhyaline, veins pale brown, rows of numerous dark brown spots between veins.

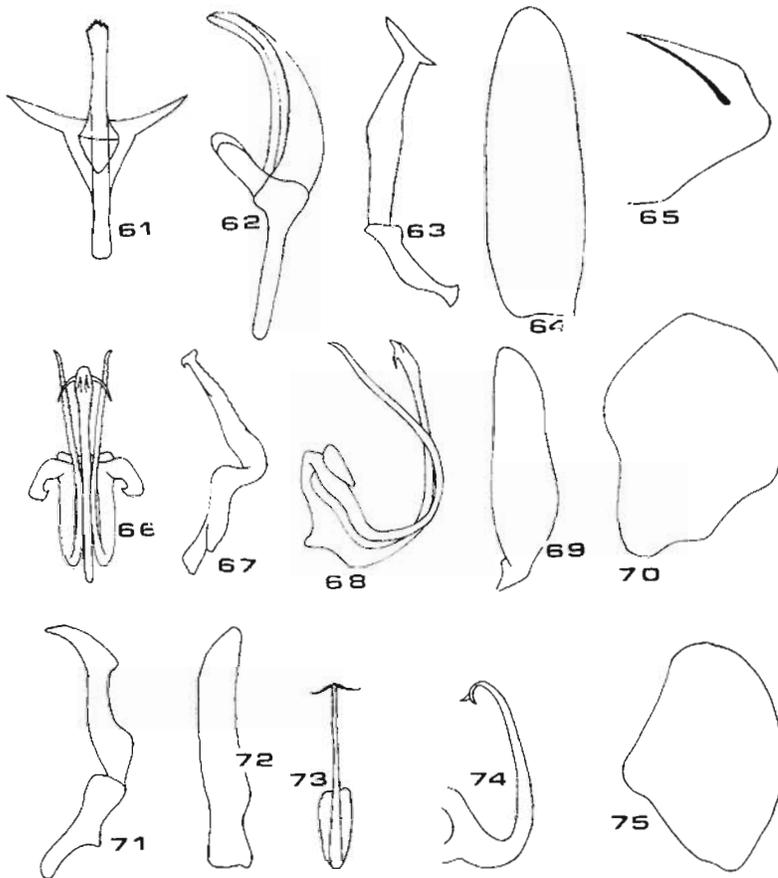
Male genital plates 4× as long as median width, apices narrowed, rounded. Style blade serrate on ventral margin on apical 2/3, apex slightly widened each side of blade stem, transverse, truncate. Aedeagal shaft slender, pointed at apex, with a pair of short subapical spines on dorsal surface. Parameres long and slender, as long as aedeagal shaft. Pygofer narrowed, bluntly rounded apically.

15. *Acuera luhea* n.sp.
Figs. 71–75.

Type area: Panama, Pipeline Rd., Canopy Knockdown, Luhea seemani.

Type locality: *Holotype* male, Panama, Pipeline Rd., Canopy Knockdown, Luhea seemani 24-X-1975. — *Paratype* female, Panama, Las Cumbres, 6-I-1975 at light, leg. H. Wolda in coll. DeLong.

Diagnosis: Placed in subgenus *Tortusana* DeLong &



Figs. 61-65. *Polana clarita* n.sp. — 61. Aedeagus, ventrally. — 62. Aedeagus, laterally. — 63. Style, laterally. — 64. Plate, ventrally. — 65. Pygofer, laterally, apical portion. — Figs. 66-70. *Acuera rana* n.sp. — 66. Aedeagus, ventrally. — 67. Style, laterally. — 68. Aedeagus, laterally. — 69. Plate, ventrally. — 70. Pygofer, laterally. — Figs. 71-75. *Acuera luhea* n.sp. — 71. Style, laterally. — 72. Plate, ventrally. — 73. Aedeagus, ventrally. — 74. Aedeagus, laterally. — 75. Pygofer, laterally.

Freytag. Differs from *A. ungera* DeL. & Frey. by the male genital structures as illustrated.

Etymology: Named after the type locality.

Description

Length of male 11 mm, female 11 mm. Crown produced and rounded 2/3 as long at middle as width between eyes at base. Color, crown and pronotum brownish yellow with dark brown

punctate spots. Scutellum pale brown with dark brown basal angles. Forewings yellowish subhyaline with pale brown punctate spots between brown veins. Costal marginal area with dark brown vermiculate markings alternating with small white areas.

Female 7th sternum with posterior margin slightly roundly produced, with a shallow Ushaped notch at middle.

Male plates elongate, almost uniform in width to curved, bluntly pointed apices. Blade curved, almost shape of elongate "S", with apical 1/3 similar to a foot, its apex narrow and bluntly pointed. Heel formed by a short spine on ventral margin at 2/3 length of blade. Aedeagus long, slender, curved dorsally at apex and bearing 2 short, curved, apical processes. Pygofer with caudal margin angled and bluntly pointed.

Manuscript received March 1980.

References

- DeLong, D. M. & Freytag, P. H. 1972. Studies of the World Gyponinae (Homoptera: Cicadellidae) The genus *Polana*. — *Arquivos Zoologia* 22: (5) 239-324. S. Paulo.
- 1974. Studies of the genus *Acuera* (Homoptera: Cicadellidae). — *Ohio Jour. Sci.* 74: (3)185-200.
- 1976. Studies of the World Gyponinae (Homoptera: Cicadellidae). A synopsis of the genus *Curtara*. — *Brenesia* 7: 1-97.