

FIVE NEW SPECIES OF *BALERA* FROM ECUADOR (HOMOPTERA: CICADELLIDAE)^{1,2}

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ABSTRACT: Five new species are added to the genus *Balera*: *B. myersi* n. sp., *B. ecuadora* n. sp., *B. obtusa* n. sp., *B. napoensis* n. sp. and *B. plagata* n. sp. These are described and illustrated from Ecuador and compared to the known species, with a key to all species of the genus.

The genus *Balera* (Typhlocybinae: Alebrini) was described by Young (1952) and reviewed by Young (1957); he included four species from Panama, Brazil, Bolivia and Trinidad. One additional species has been described from Colombia by Ruppel (1959). Five new species are described at this time from Ecuador and are compared with their closest relatives.

All species described fit the generic characters, having the unusual apodemes of the first abdominal segment, the unusual small hook at the apex of the male genital plate, the same forewing venation and the general appearance of an *Empoasca* species. The color pattern varies from a general straw yellow to yellow green. Some species have the same overall color, with some or all of the following: an ivory spot on the hind margin of the head, an ivory medial dash on the basal part of the meso-scutellum and dark brown spots or dashes in the apical cells of the forewing. Also some species have yellow dashes in the basal half of the forewing. The color pattern varies some within a species and varies so little between species that the male genitalia must be relied upon to separate species of this genus.

All specimens in this study are preserved in 80% ethyl alcohol with the abdomen cleared and preserved in glycerin. Holotypes are deposited in the California Academy of Science Collection. I wish to thank David Neill for the opportunity to collect these very interesting leafhoppers at the Jatun Sacha Biological Station, Napo, Ecuador.

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Key to the species of *Balera*

1. Aedeagus without apical processes 2
- 1'. Aedeagus with apical processes 4
2. Aedeagus short, inflated, with three apical lobes (Bolivia) *pellucida* (Osborn)
- 2'. Aedeagus long and narrow 3
3. Aedeagus bifurcate on apical half (Colombia) *bracata* Ruppel
- 3'. Aedeagus not bifurcate, with pair of lateral keels on apical half (Panama) *pusilla* Young
4. Aedeagus with two pair of apical processes 5
- 4'. Aedeagus with one pair of apical processes 6
5. Aedeagus with dorsal pair of apical processes thicker and longer than ventral pair (Figs. 1 & 2) (Ecuador) *myersi* Freytag n. sp.
- 5'. Aedeagus with ventral pair of apical processes thicker and about same length as dorsal pair (Bolivia) *emarginata* (Osborn)
6. Style sharply pointed at apex (Fig. 11) 7
- 6'. Style bluntly truncate at apex (Fig. 7) (Ecuador) *obtusa* Freytag n. sp.
7. Aedeagus with apical ends of processes converging, in ventral view, near base of shaft (Fig. 17) (Ecuador) *napoensis* Freytag n. sp.
- 7'. Aedeagus with apical ends of processes parallel or slightly diverging (Figs. 9 & 21) 8
8. Aedeagus with apical processes nearly straight, in lateral view (Fig. 22); pygofer apex nearly pointed (Fig. 24) (Ecuador) *plagata* Freytag n. sp.
- 8'. Aedeagus with apical processes sinuate, in lateral view (Fig. 14); pygofer apex rounded, more robust (Fig. 16) 9
9. Apex of aedeagus, in ventral view, rounded, robust (Fig. 13); style not strongly angled on apical half (Fig. 15) (Brazil) *caraguatae* Young
- 9'. Apex of aedeagus, in ventral view, narrow, nearly pointed (Fig. 9); style strongly angled on apical half (Fig. 11) (Ecuador) *ecuadora* Freytag n. sp.

Balera myersi n. sp.

(Figures 1-4)

Length of males 3.2-3.3 mm, width of head 0.6 mm; female unknown. Similar to *caraguatae* in size and color, except only dark spots on apical area of forewing present.

Overall color yellow green. Forewings with apical tip of clavus dark brown, usually five more large brown spots in various cells apical to clavus.

Male genitalia: Genital plates long, narrow, exceeding pygofer only slightly. Pygofer triangular in lateral view with a sharp upturned apex. Style short, hooked at apical end, bent dorsad near middle. Aedeagus broad at base in lateral view, narrowed near apex with two pairs of apical processes, dorsal pair larger than ventral pair.

Holotype male: ECUADOR — Napo, Estación Biológica Jatun Sacha, July 31, 1989, blacklight trap, Paul H. Freytag and Tom Myers (CAS). Paratype male: ECUADOR — same data as holotype, except August 2, 1989, deposited in the University of Kentucky Collection.

This species has two pairs of processes as in *emarginata*, however the larger of the two is dorsal, not ventral as in *emarginata*. The style is also thicker and the pygofer apex is less abruptly narrowed. It is an honor to name this species after Tom Myers, President of All-Rite Pest Control, Lexington, KY and an excellent collector and photographer of insects.

***Balera obtusa* n. sp.**

(Figures 5-8)

Length of males 3.6-3.7 mm, width of head 0.6-0.7 mm; female unknown. Size slightly larger than *caraguatae*, color similar.

Overall color yellow green. Head with a white medial spot on posterior margin, ocelli white, eyes reddish white. Basal area of scutellum with a medial white dash. Small white spot on mesopleural area. Forewing with apical tip of clavus brown, five more small brown spots in various cells apical to clavus.

Male genitalia: Genital plates long, narrow, slightly longer than pygofer. Pygofer triangular and bluntly pointed at apex. Style robust with apex dark and bluntly truncate. Aedeagus similar to *caraguatae* except processes are sinuate with apical tips close together on ventral side of shaft.

Holotype male: ECUADOR — Napo, Estación Biológica Jatun Sacha, August 2, 1989, blacklight trap, Paul H. Freytag and Tom Myers (CAS). Paratypes: two males, same data as holotype, deposited in the University of Kentucky Collection, and two males, same data as holotype, except August 1, 1989, at light, deposited in the National Collection, Quito, Ecuador.

This species is closest to *caraguatae*, but the blunt styles will easily separate these two species.

***Balera ecuadora* n. sp.**

(Figures 9-12)

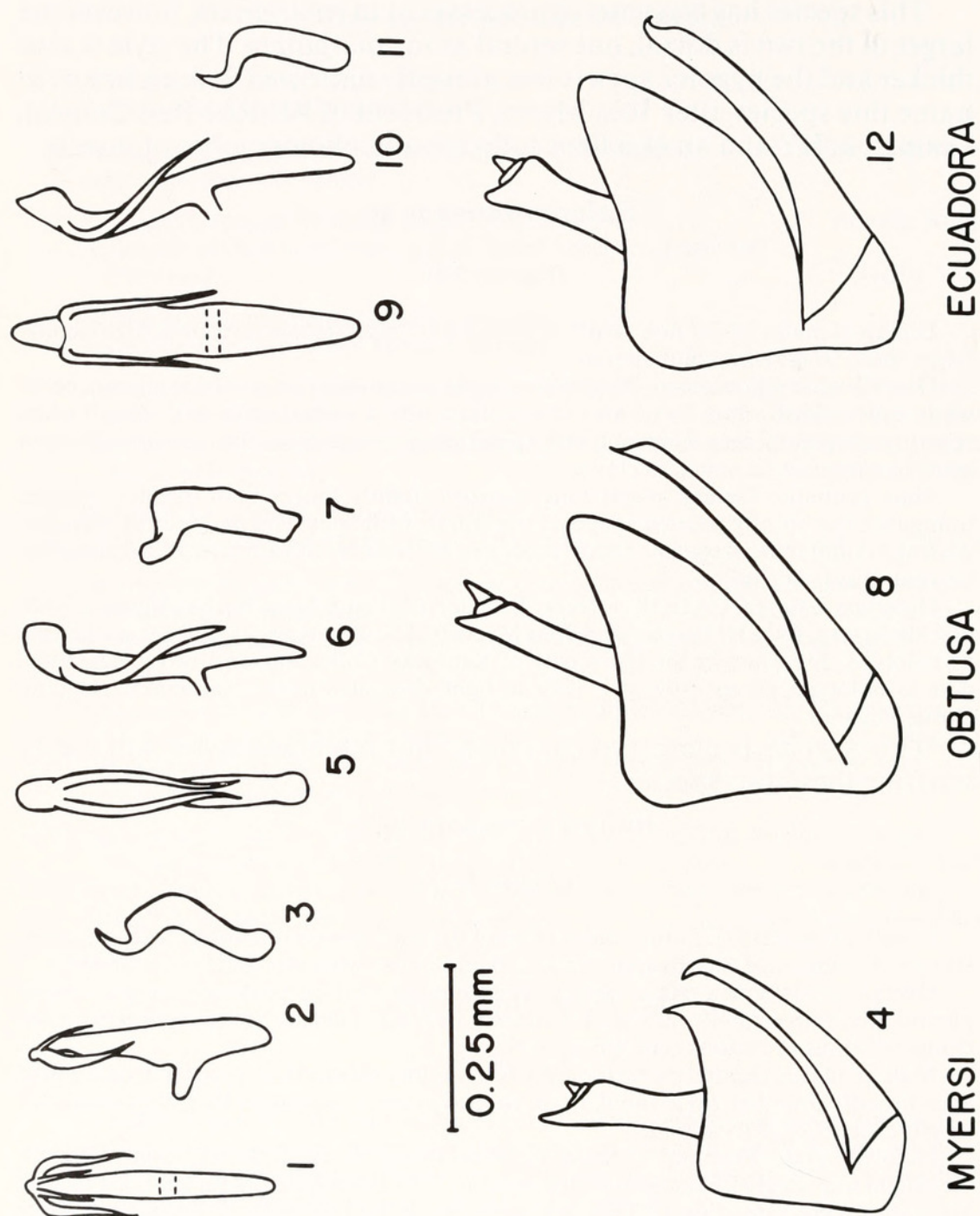
Length of males 3.3-3.6 mm, width of head 0.6 mm; female unknown. Size and color similar to *caraguatae*, except spots on apical end of forewing elongate, not rounded.

Overall yellow green. Head with a white medial spot on posterior margin. Mesopleural area with a small white spot. Forewing with tip of clavus brown, with five brown elongated spots in various cells apical to clavus.

Male genitalia: Genital plates long, narrow, slightly shorter than pygofer. Pygofer with apex broadly rounded. Style small, hook-shaped at apex. Aedeagus long, processes half length of shaft, slightly sinuate.

Holotype male: Ecuador — Napo, Estación Biológica Jatun Sacha, August 2, 1989, blacklight trap, Paul H. Freytag and Tom Myers (CAS). Paratypes: two males, same data as holotype, except dated July 31, 1989, one deposited in the University of Kentucky Collection and the other in the National Collection, Quito, Ecuador.

This species is closely related to *obtusa* but can be separated by having the genital plates of the male shorter than the pygofer and the normal type of style.



Figures 1-4 *Balera myersi* n. sp. 1. aedeagus, ventral view, 2. Aedeagus, lateral view, 3. style, lateral view, 4. male genital capsule, lateral view, setae omitted. Figures 5-8 *Balera obtusa* n. sp. 5. aedeagus, ventral view, 6. aedeagus, lateral view, 7. style, lateral view, 8. male genital capsule, lateral view, setae omitted. Figures 9-12 *Balera ecuadora* n. sp. 9. aedeagus, ventral view, 10. aedeagus, lateral view, 11. style, lateral view, 12. male genital capsule, lateral view, setae omitted. All drawn to the same scale.

***Balera caraguatae* Young**

(Figures 13-16)

Balera caraguatae Young, 1957, p. 172.

Length of male 3.3-3.6 mm, width of head 0.6 mm.

Overall color yellow green. Head with a white medial spot on posterior margin, ocelli white. Mesopleural area with a small white spot. Forewing with six yellow orange dashes arranged in four rows from base to near apex of clavus, apical brown spots as in *obtusa*.

This species is illustrated for comparative purpose, and to attempt to further clarify some of the male genitalic features which Young illustrated in his original description. The specimen from which the drawings were made is labeled as follows: "BRAZIL — Rondonia, 82 km. S. Frazenda, Rancho Grande, 10°32'S, 82°48'W, November 13, 1991, at light, Tom Myers", and is in the University of Kentucky Collection.

***Balera napoensis* n. sp.**

(Figures 17-20)

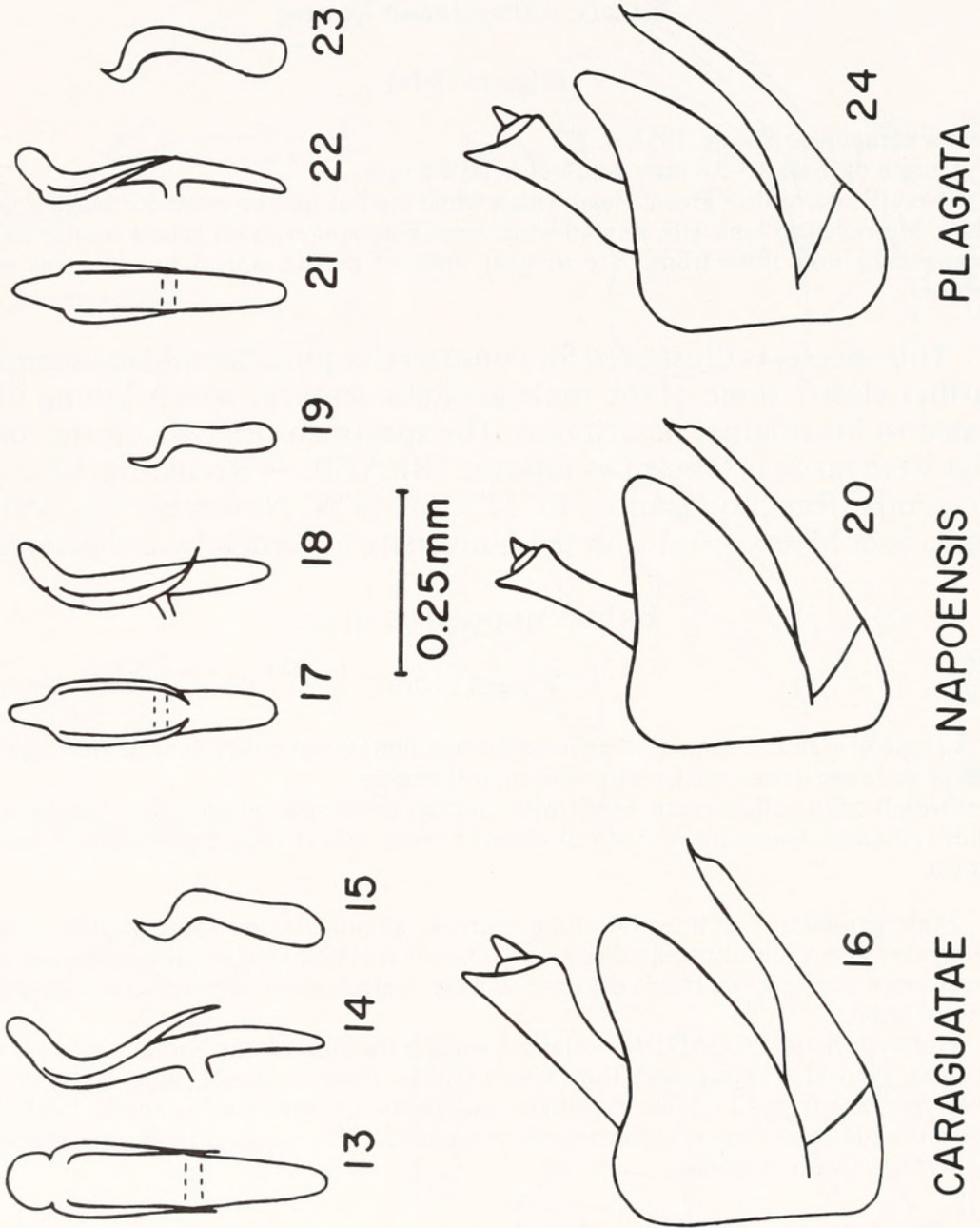
Length of males 3.3 mm, width of head 0.6 mm; female unknown. Similar to *caraguatae*, except male genitalia smaller with distinct differences.

Overall color yellow green. Head with median white spot on posterior margin, ocelli white, eyes red. Forewing with tip of clavus brown, apical spots brown, apical margin brown.

Male genitalia: Genital plate long, narrow, slightly longer than pygofer. Pygofer triangular with a bluntly pointed apex. Style small, hook-shaped at apex. Aedeagus short, processes extending two thirds distance to base of shaft, each with apex turning slightly toward shaft.

Holotype male: ECUADOR — Napo, Estación Biológica Jatun Sacha, August 1, 1989, at light, Paul H. Freytag and Tom Myers (CAS). Paratypes: one male, same data as holotype, except July 31, 1989, blacklight trap, in the University of Kentucky Collection, and one male, same data as holotype, except August 2, 1989, blacklight trap, in the National Collection, Quito, Ecuador.

This species is closely related to *ecuadora* but smaller and with the aedeagal processes not sinuate.



Figures 13-16 *Balera caraguatae* Young 13. aedeagus, ventral view, 14. aedeagus, lateral view, 15. style, lateral view, 16. male genital capsule, lateral view, setae omitted. Figures 17-20 *Balera napoensis* n. sp. 17. aedeagus, ventral view, 18. aedeagus, lateral view, 19. style, lateral view, 20. male genital capsule, lateral view, setae omitted. Figures 21-24 *Balera plagata* n. sp. 21. aedeagus, ventral view, 22. aedeagus, lateral view, 23. style, lateral view, 24. male genital capsule, lateral view, setae omitted. All drawn to the same scale.

Balera plagata n. sp.

(Figures 21-24)

Length of males 3.1-3.2 mm, width of head 0.5 mm; female unknown. Similar to *caraguatae*, but slightly smaller, and with smaller male genital structures.

Overall color yellow green. Head with median white spot on posterior margin, ocelli white, eyes red. Mesopleural area with a small white spot. Forewing with faint yellow patches on basal half, apical spots similar to previous species with the addition of one spot on vein bordering appendix and three on apical margin.

Male genitalia: Genital plates long, narrow, about same length as pygofer. Pygofer triangular with a bluntly pointed dorsally projecting apex. Style narrow with a hook-like apex. Aedeagus short, with a pair of processes extending basad half distance to base of shaft.

Holotype male: ECUADOR — Napo, Estación Biológica Jatun Sacha, August 2, 1989, blacklight trap, Paul H. Freytag and Tom Myers (CAS). Paratypes: two males, same data as holotype, deposited in the University of Kentucky Collection; one male, same data as holotype, except July 31, 1989, deposited in the National Museum, Quito, Ecuador.

This species is closest to *napoensis*, but can be separated by the narrower apex of the male pygofer and the processes of the aedeagus being closely appressed to the shaft and not curved at their apices.

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