

A New Genus of Deltocephalinae (Hemiptera: Cicadellidae) from Ecuador and a New Synonym of *Luheria constricta* Osborn with Illustrations of the Female

JAMES NORMAN ZAHNISER

Department of Entomology, University of Illinois at Urbana/Champaign, 320 Morrill Hall, Urbana, IL 61801 and Illinois Natural History Survey, Center for Biodiversity, 607 E. Peabody Drive, Champaign, IL 61820

Ann. Entomol. Soc. Am. 98(5): 653–657 (2005)

ABSTRACT The new deltocephaline leafhopper genus *Oxycephalotettix* is described and illustrated based on one species, *Oxycephalotettix tiputini* sp. nov., from Ecuador, and is placed in Athysanini. The genus bears a superficial resemblance to *Luheria* Osborn (Luheriini), especially in the coloration of the forewing. Based on the examination of type material, *Luheria constricta* Osborn is herein considered a senior synonym of *Tenucephalus hamatus* DeLong, new synonymy. The female genitalia of *L. constricta* are illustrated for the first time, and the known range of this species is expanded to include Bolivia, northern Argentina, and northeastern Brazil.

KEY WORDS Deltocephalinae, Luheriini, Athysanini, new genus, new species

THE NEOTROPICAL DELTOCEPHALINE FAUNA comprises a diverse and poorly known assemblage of leafhoppers currently classified in 14 tribes, two of which (Luheriini and Cerrillini) are endemic. Linnavuori (1959) published a comprehensive review of the fauna, but many new genera and species have been described since then (Cwikla and Blocker 1981), and recent sampling of the Amazonian rain forest canopy by insecticidal fogging has revealed the presence of a rich and mostly undescribed fauna (Dietrich and Rakitov 2002). This article provides new morphological and distributional data for the Neotropical deltocephaline *Luheria constricta* Osborn, the sole member of the tribe Luheriini; and a new genus and species from the rain forest canopy, *Oxycephalotettix tiputini* gen. et sp. nov., that superficially resembles *Luheria*, is described and placed in Athysanini.

The last comprehensive review of cicadellid classification (Oman et al. 1990) lists 265 genera in Athysanini and is estimated here to contain 2,200 described species. This tribe is not defined by any unique apomorphies and contains numerous plesiomorphic and apomorphic genera united only by the absence of characters defining other tribes of Deltocephalinae. Further studies should have the aim of breaking this group into more manageable and natural units, but this task is outside the scope of this article. *Oxycephalotettix* gen. nov. apparently belongs to the athysanine *Bahita* group of genera (Linnavuori and DeLong 1978), based on the carinate anterior margin of the head and the reflexed costal veins in the forewing.

Morphological terminology follows Oman (1949) and Kramer (1950) except for the leg chaetotaxy, which follows the system of Rakitov (1998). Abdomens were cleared in KOH and suspended glycerin. Digital photo-

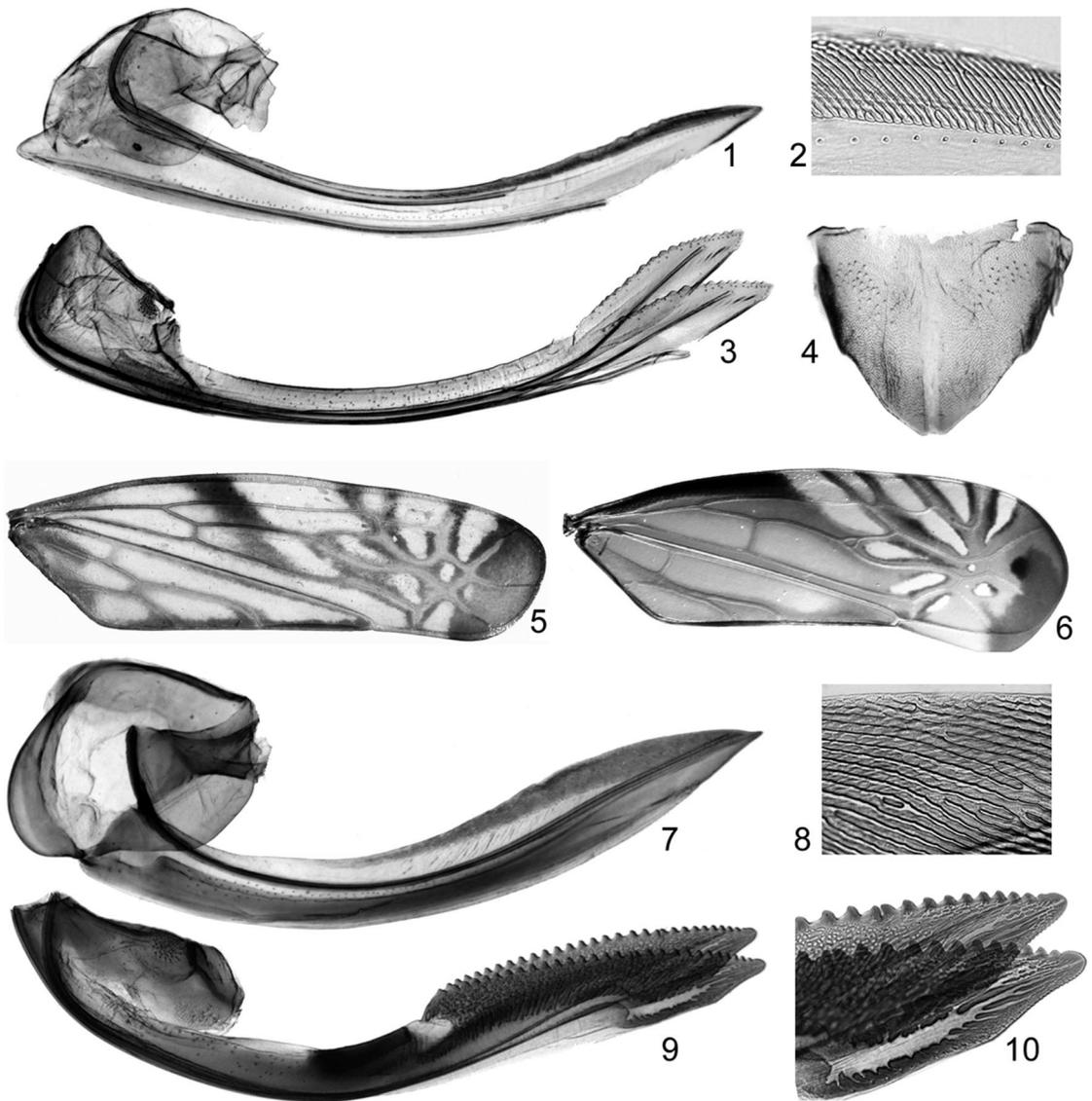
graphs were taken with a Q Imaging Micropublisher 3.3 digital camera mounted on an Olympus SZX12 stereomicroscope and with a Nikon D1x digital SLR camera configured with lenses by Microoptics (Digital Lab XLT system).

The material studied here is deposited at the following institutions: Carnegie Museum of Natural History (CMNH), Illinois Natural History Survey (INHS), The Ohio State University Insect Collection (OSU), and the United States National Museum of Natural History (USNM). Specimen labels are in quotation marks, and label lines are separated by a reversed virgule (\).

Deltocephalinae Dallas 1870
Luheriini Linnavuori 1959
Luheria constricta Osborn 1923: 31
(Figs. 1–5)

Tenucephalus hamatus DeLong 1982: 611; new synonymy

Osborn (1923) described the genus and species *L. constricta* based on five male specimens from north eastern Brazil. Linnavuori (1959) illustrated the male and erected the monobasic tribe Luheriini for this genus, stating that the T-shaped connective “excludes it from the more advanced tribes of [Deltocephalinae].” While examining some specimens of *Tenucephalus* DeLong from The Ohio State University Insect Collection, I discovered that one species, *T. hamatus*, was obviously larger and more robust than the rest. Examination of the male genitalia and comparison of the holotypes of *T. hamatus* and *L. constricta* revealed that they are syn-



Figs. 1-10. *L. constricta* (Figs. 1-5): (1) First valvula. (2) Detail of first valvula dorsal sculpturing. (3) Second valvulae. (4) Sternite VII. (5) Forewing. *O. tiputini* gen. et sp. nov. (Figs. 6-10): (6) Forewing. (7) First valvula. (8) Detail of first valvula dorsal sculpturing. (9) Second valvulae. (10) Detail of teeth of second valvulae.

onyms. Included in the paratype series of *T. hamatus* was one female, which is illustrated here for the first time. The additional specimens of *L. constricta* extend its range from its type locality in Barra, Bahia, Brazil, and other records from northern Argentina to central Bolivia.

Distribution. This species is geographically widely distributed, being recorded from the northeastern Brazilian state, Bahia, the northern Argentinian provinces, Tucumán, Salta, and Misiones, and the central Bolivian province, Santa Cruz.

Female. Pygofer setose. First valvula dorsal sculpturing pattern (Fig. 2) strigate, ventroapical sculpturing (Fig. 1) reticulate and fading into smooth surface of valvula; base of first valvula pointedly produced

anteriorly. Second valvula (Fig. 3) with blunt dorsal teeth restricted to apical one-fourth. Third valvula with a few small ventroapical setae. Sternite VII (Fig. 4) length subequal to width, posterior margin parabolically produced, slightly notched at apex.

Type Material. The holotype and paratypes of *L. constricta* remain at CMNH and the type series of *T. hamatus* remains at OSU.

Athysanini Van Duzee 1892
Oxycephalotettix Zahniser gen. nov.
 (Figs. 6-18)

Type species: *Oxycephalotettix tiputini* Zahniser sp. nov.

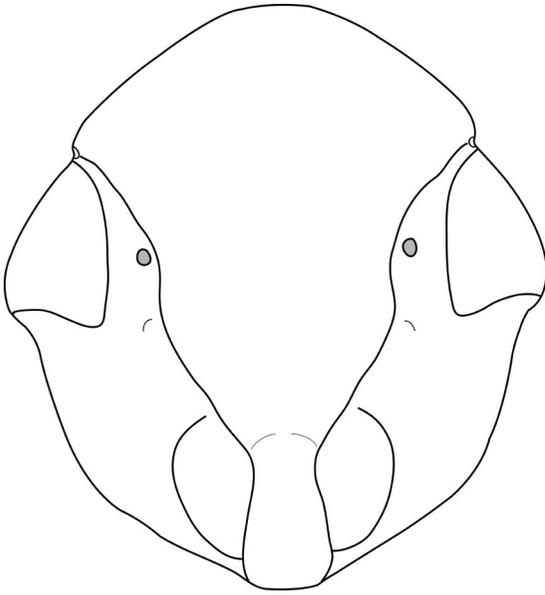


Fig. 11. *O. tiputini* gen. et sp. nov.; face, antennal sockets filled in gray.

Oxycephalotettix gen. nov. is known from specimens collected in the rain forests of Ecuador. It bears a superficial resemblance to *Luheria*, including a similar color pattern on the forewing (Figs. 5 and 6), but otherwise it has unique male genitalia and cephalic structure that require a new genus to accommodate it. Despite the strikingly similar color pattern of the



Fig. 12. *Oxycephalotettix tiputini* gen. et sp. nov.; female sternite VII.

forewing, no unambiguous characters were found that indicate that these genera are related. Both *Oxycephalotettix* and *Luheria* possess lateral processes of male segment X (Fig. 17), a character that occurs rarely in Deltocephalinae. However, the shape and positions are different: broad, blunt, and arising anterolaterally in *Luheria*, and falcate, sharp, and arising posterolaterally in *Oxycephalotettix*. *Oxycephalotettix* does not possess the T-shaped connective characteristic of *Luheria*, but it has a Y-shaped connective. Based on this character and on the absence of characters defining other tribes of Deltocephalinae, this genus is placed in Athysanini. The carinate anterior margin of the head and the reflexed costal veins suggest that it is related to the *Bahita*-group of genera (Linnavuori and DeLong 1978). *Oxycephalotettix* keys to *Hecaloidia* Osborn in the Linnavuori and DeLong (1978) key based on the foliaceous anterior margin of the head, but it differs from that genus significantly in the male genitalia.

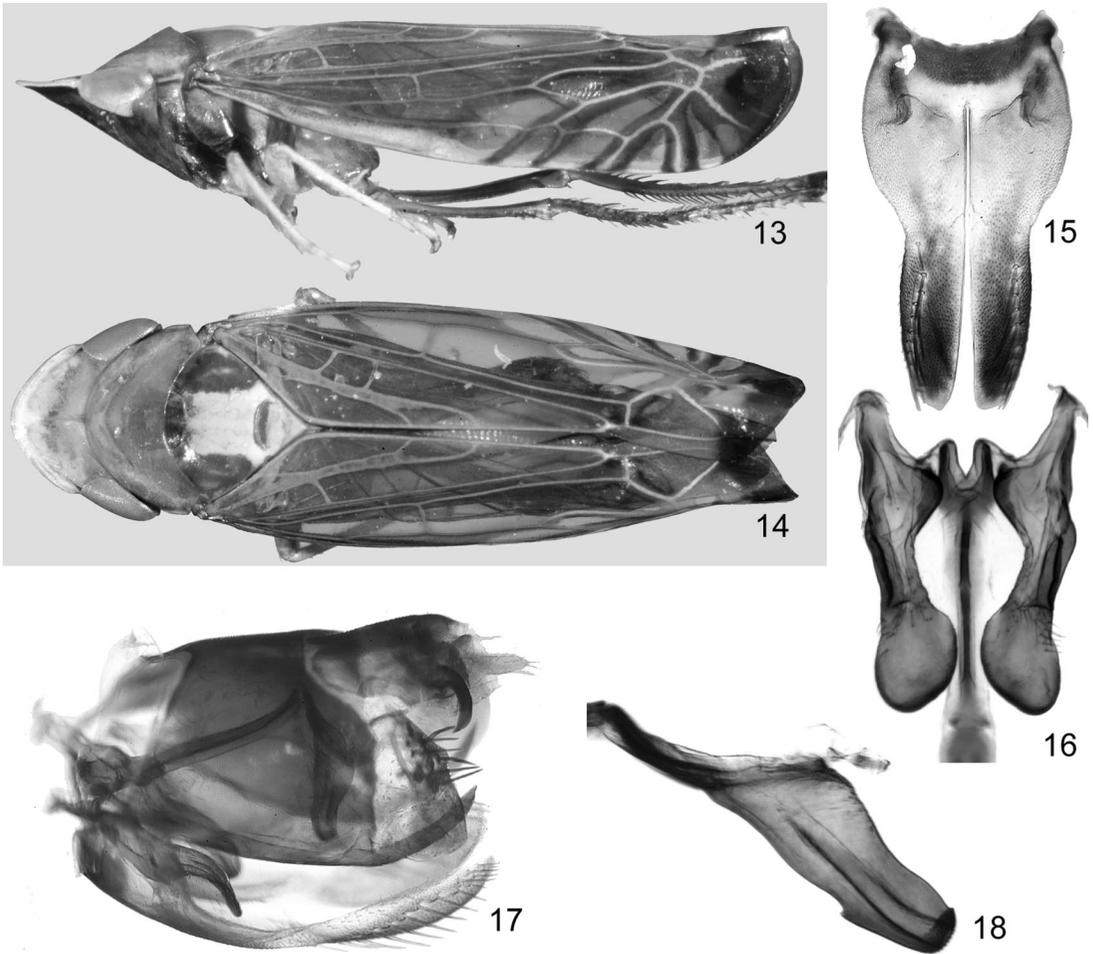
Diagnosis. Moderate- to large-sized deltocephaline leafhoppers with orange, brown, and fuscous markings; anterior margin of head (Fig. 13) foliaceous, with a single transverse carina; face flattened; forewing reflexed costal veins and apical veins broadly outlined with brownish pigmentation (Figs. 6 and 13); male subgenital plates fused to valve (Fig. 15); male segment X with falcate processes arising posterolaterally (Fig. 17).

External Morphology. Length 8–9 mm. Crown (Figs. 13 and 14) flat, slightly upturned anteriorly, almost as long as pronotum; crown surface radially and longitudinally striate anteriorly, weakly striate to glabrous posteriorly; anterior margin of head (Fig. 13) foliaceous, with a single transverse carina. Ocelli (Fig. 11) abutting eyes. Face flat; antennal ledges absent; frontoclypeus radially and longitudinally striate anteriorly, shagreen posteriorly; clypellus (Fig. 11) widening toward apex; clypellar suture obscure. Forewing (Figs. 6, 13, and 14) with inner antepical cell open, reflexed costal veins and apical veins broadly outlined with brownish pigmentation. Profemur row AV reduced, with four to six small, widely spaced setae, intercalary row with eight to 10 long setae, row AM with only AMI; hind femur macrosetal formula variable, 2 + 2 + 1, 2 + 2 + 1 + 1, or 2 + 2 + 1 + 1 + 1.

Male. See description of *O. tiputini* sp. nov.

Female. Pygofer with macrosetae ventrally and caudally; first valvula dorsal sculpturing pattern (Fig. 8) strigate, reaching dorsal margin, ventroapical sculpturing (Fig. 7) weak; second valvula (Fig. 9) abruptly broadening medially, with numerous (≈ 30) nonseriate dorsal teeth (Fig. 10), extending nearly half length of valvula; third valvula with several ventroapical macrosetae; sternite VII (Fig. 12) longer than wide, with a large apical notch.

Etymology. The genus name is formed by combining the Greek words “oxys” (=sharp, acute), “cephalo” (=head), and “tettix” (=cicada). The gender is masculine.



Figs. 13–18. *O. tiputini* gen. et sp. nov. Female, abdomen removed (Figs. 13 and 14): (13) Lateral habitus. (14) Dorsal habitus. Male (Figs. 15–18): (15) Subgenital plates and valve. (16) Connective and styles, ventral view. (17) Pygofer, lateral view. (18) Aedeagus, lateral view.

Oxycephalotettix tiputini Zahniser sp. nov.
(Figs. 6–18)

External Morphology. Crown (Fig. 14) with an ill-defined parabolic band of orange or fuscous medially; face brown to black with fuscous muscle scars, with a white band on anterior margin below carina. Pronotum (Fig. 14) fuscous with a thin parabolic orange band. Forewing (Figs. 6, 13, and 14) with anterior half of costal margin opaque; veins A1 and A2 (Fig. 14) approaching each other near midlength, connected by several small crossveins.

Male. Pygofer (Fig. 17) with tergum IX long and well sclerotized; lobe with posterodorsally projecting processes arising from ventral margin; with ≈ 12 macrosetae arranged in three dorsoventrally oriented rows near caudal margin. Segment X (Fig. 17) long, strongly sclerotized dorsally, with pair of ventrally directed falcate processes arising posterolaterally. Subgenital plates (Fig. 15) very long, extending slightly beyond pygofer apex; constricted medially; fused with valve; distal lobe with uniseriate row of

macrosetae arising mesad of lateral margin. Connective (Fig. 16) Y-shaped with short anterior arms; stem very long. Style (Fig. 16) not very broad basally; preapical lobe very broad; apophysis expanded, lobate. Aedeagus (Fig. 18) articulated with connective; preatrium well developed; dorsal apodeme vestigial; shaft short, stout, extended ventrad, strongly compressed, with apical flange; gonopore apical; texture surrounding gonopore granular.

Female. As in genus description; apical notch on sternite VII (Fig. 12) with pair of points subapically.

Type Material. HOLOTYPE: Male (USNM), "ECUADOR: Orellana \ Tiputini Biodiversity Station \ nr Yasuni National Park; 220–250 m \ 00° 37' 55" S 076° 08' 39" W \ 5-VII-1998; T.L. Erwin et al. \ fogging; terre firme forest; lot# 1887"; PARATYPE: male (INHS), "ECUADOR: Orellana \ 1 km S. Onkone Gare Camp \ 220 m; 00° 39' 10" S 076° 26' 00" W \ 7-II-1996; T.L. Erwin et al. \ fogging; terre firme forest"; PARATYPE: Male (INHS): "ECUADOR: Orellana \ Tiputini Biodiversity Station \ 20–31-VII-2000 \ S.A. Cameron";

PARATYPE: female (USNM), "ECUADOR: Orellana \ Tiputini Biodiversity Station \ nr Yasuni National Park; 220–250 m \ 00° 37' 55" S 076° 08' 39" W \ 4-VII-1998; T.L. Erwin et al. \ fogging; terre firme forest." One of the male paratypes housed at INHS has been completely cleared and is preserved in glycerin; genomic DNA was extracted and is also stored at INHS.

Etymology. The species name reflects its type locality, the Tiputini Biodiversity Station in Orellana, Ecuador. The species name is a noun in apposition.

Acknowledgments

I thank T. L. Erwin for allowing the Dietrich laboratory access to canopy fogging samples and S. A. Cameron and J. B. Whitfield for providing specimens from their collections. I also thank to R. L. Davidson, J. E. Rawlins, and W. Zanol (CMNH) for facilitating the loan of Osborn's material and L. Musetti (OSU) for facilitating the loan of DeLong's material. C. H. Dietrich provided helpful comments on an earlier version of the manuscript, and additional comments by P. Gullan and two anonymous reviewers are acknowledged. This research was funded in part by a grant from the Research Board at the University of Illinois at Urbana/Champaign.

References Cited

Cwikla, C. W., and H. D. Blocker. 1981. Neotropical genera of Deltocephalinae not included in Linnavuori's 1959 key. *Bull. Entomol. Soc. Am.* 27: 170–178.

- DeLong, D. M. 1982. Some new Neotropical leafhoppers of the subfamilies Iassinae and Deltocephalinae (Homoptera: Cicadellidae). *Proc. Entomol. Soc. Wash.* 84: 610–616.
- Dietrich, C. H., and R. A. Rakitov. 2002. Some remarkable new deltocephaline leafhoppers (Hemiptera: Cicadellidae: Deltocephalinae) from the Amazonian rainforest canopy. *J. N.Y. Entomol. Soc.* 110: 1–48.
- Kramer, S. 1950. The morphology and phylogeny of auchenorhynchous Homoptera (Insecta). *Ill. Biol. Monogr.* 20: 1–111.
- Linnavuori, R. 1959. Revision of the Neotropical Deltocephalinae and some related subfamilies (Homoptera). *Ann. Zool. Soc. 'Vanamo'* 20: 1–370.
- Linnavuori, R., and D. M. DeLong. 1978. Neotropical leafhoppers of the *Bahita* group (Homoptera: Cicadellidae: Deltocephalinae). A contribution to the taxonomy. *Brenesia* 14–15: 109–169.
- Oman, P. W. 1949. The Nearctic leafhoppers - a generic classification and checklist. *Mem. Entomol. Soc. Wash.* 3: 1–253.
- Oman, P. W., W. J. Knight, and M. W. Nielson. 1990. Leafhoppers (Cicadellidae): a bibliography, generic checklist, and index to the world literature 1956–1985. CAB International Institute of Entomology, Wallingford, United Kingdom.
- Osborn, H. 1923. Neotropical Homoptera of the Carnegie Museum, parts 1–2. *Ann. Carnegie Mus.* 15: 8–26, 27–79.
- Rakitov, R. A. 1998. On differentiation of cicadellid leg chaetotaxy (Homoptera: Auchenorrhyncha: Membracoidea). *Russ. Entomol. J.* 6: 7–27.

Received 1 March 2005; accepted 13 June 2005.