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First record of *Segonalia* Young (Hemiptera: Cicadellidae: Cicadellinae) from Brazil including the description of *S. machadoi* sp. nov.

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Abstract

Segonalia, a previously monotypic genus known from Bolivia, is newly recorded from Brazil and Paraguay based on specimens of *S. steinbachi* Young, 1977 from Minas Gerais State, Brazil and Paraguay and a new species from Piauí and Pará States, Brazil. *Segonalia machadoi* sp. nov. (Holotype male deposited in CZMA: Brasil, Piauí State, Parque Nacional de Sete Cidades, 04°5'57"S, 41°42'34"W 193 m a.s.l., 12.II.2013, D.M. Takiya leg.) can be distinguished from the type species by its body length and shape of the male pygofer apex and aedeagus. A diagnosis of *Segonalia* and comparative notes and illustrations of the type species are given.

Key words: Auchenorrhyncha, Cicadellini, leafhopper, taxonomy

Introduction

The sharpshooter tribe Cicadellini (Cicadellinae) in the New World currently includes approximately 175 genera and 1,200 species (Cavichioli & Takiya 2012a). Amongst them, *Segonalia* Young, 1977 was erected by Young to include a single new species, *S. steinbachi* Young, 1977, described based on four specimens from Santa Cruz, Bolivia.

Recently, specimens of *Segonalia steinbachi* were collected in Parque Nacional da Serra do Cipó, Minas Gerais State, and a new species of *Segonalia* was collected in Parque Nacional de Sete Cidades, Piauí State (additional material from Pará State was also studied). These specimens represent the first record of this genus from Brazil.

The new species is herein described and named in honor of Dr. Angelo B. M. Machado, popular writer and renowned scientist. Both authors are inspired by his passion for dragonfly taxonomy and conservation biology, and of special importance, his legacy of children's books. Photographs of the male and female terminalia of *S. steinbachi* are also given.

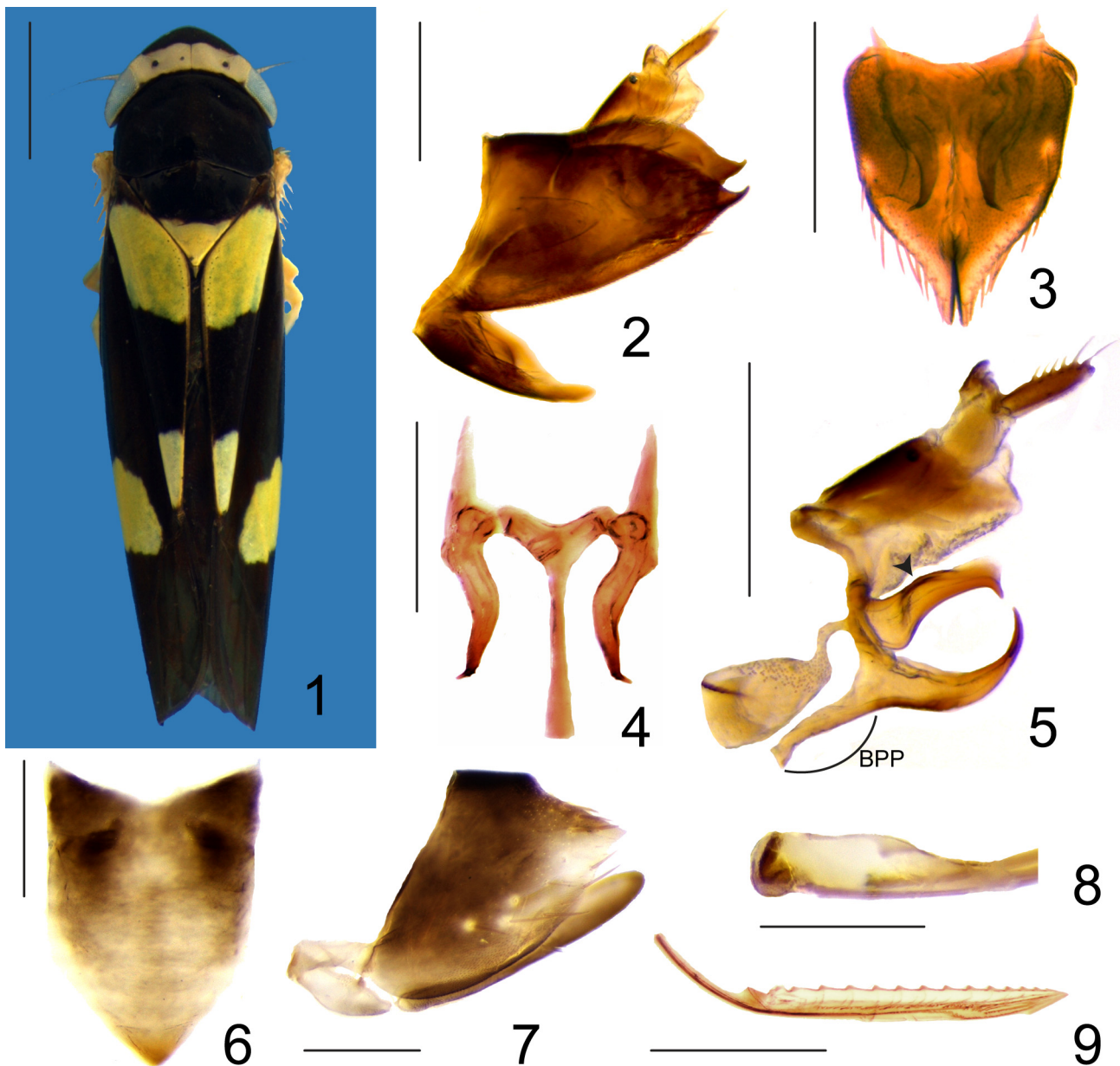
Based on the study of *Segonalia* specimens at hand, we fail to see its resemblance to *Crossogonalia* Young, 1977 suggested by Young (1977) without giving morphological characteristics to support this relationship. The original author also only cites, as diagnostic features, characteristics that separate these two genera. In our opinion, externally *Segonalia* species resemble species of *Microgoniella* Melichar, 1926 and *Juliaca* Melichar, 1926, while having a unique combination of the morphology of genitalia structures. Therefore, a diagnosis for the genus is given.

Material and Methods

Specimens studied herein are deposited in the following institutions:

CZMA - Coleção de Zoologia do Maranhão, Universidade Estadual do Maranhão, Caxias, MA, Brazil;
 INPA - Instituto Nacional de Pesquisas da Amazônia, Manaus, AM, Brazil;
 DZRJ - Coleção Entomológica Prof. José Alfredo Pinheiro Dutra, Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil;
 DZUP - Coleção de Entomologia Pe. Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, PR, Brazil.

Terminology follows mainly Young (1968, 1977), except for the head structures, which follows Hamilton (1981) and Mejdalani (1998). Terminology for the leg chaetotaxy follows Rakitov (1997). Male terminalia were prepared according to Oman (1949) with modifications adopted by Cavichioli & Takiya (2012b). Terminalia were analyzed and photographed in glycerin and posteriorly stored in microvials. In quotations of label data, a reversed virgule (\) separates lines on the label.



FIGURES 1–9. *Segonalia steinbachi* Young, 1977. 1. dorsal habitus; 2. male genital chamber, lateral view; 3. valve and subgenital plates, ventral view; 4. connective and styles, dorsal view; 5. aedeagus, paraphysis, and anal tube, lateral view; 6. female sternite VII, ventral view; 7. female genital chamber, lateral view; 8. base of right first valvula of ovipositor, ventral view; 9. second valvula of ovipositor, lateral view. BPP = basal portion of paraphysis; scale bars = 1.0 mm (Fig. 1) and 0.5 mm (Figs 2–9).

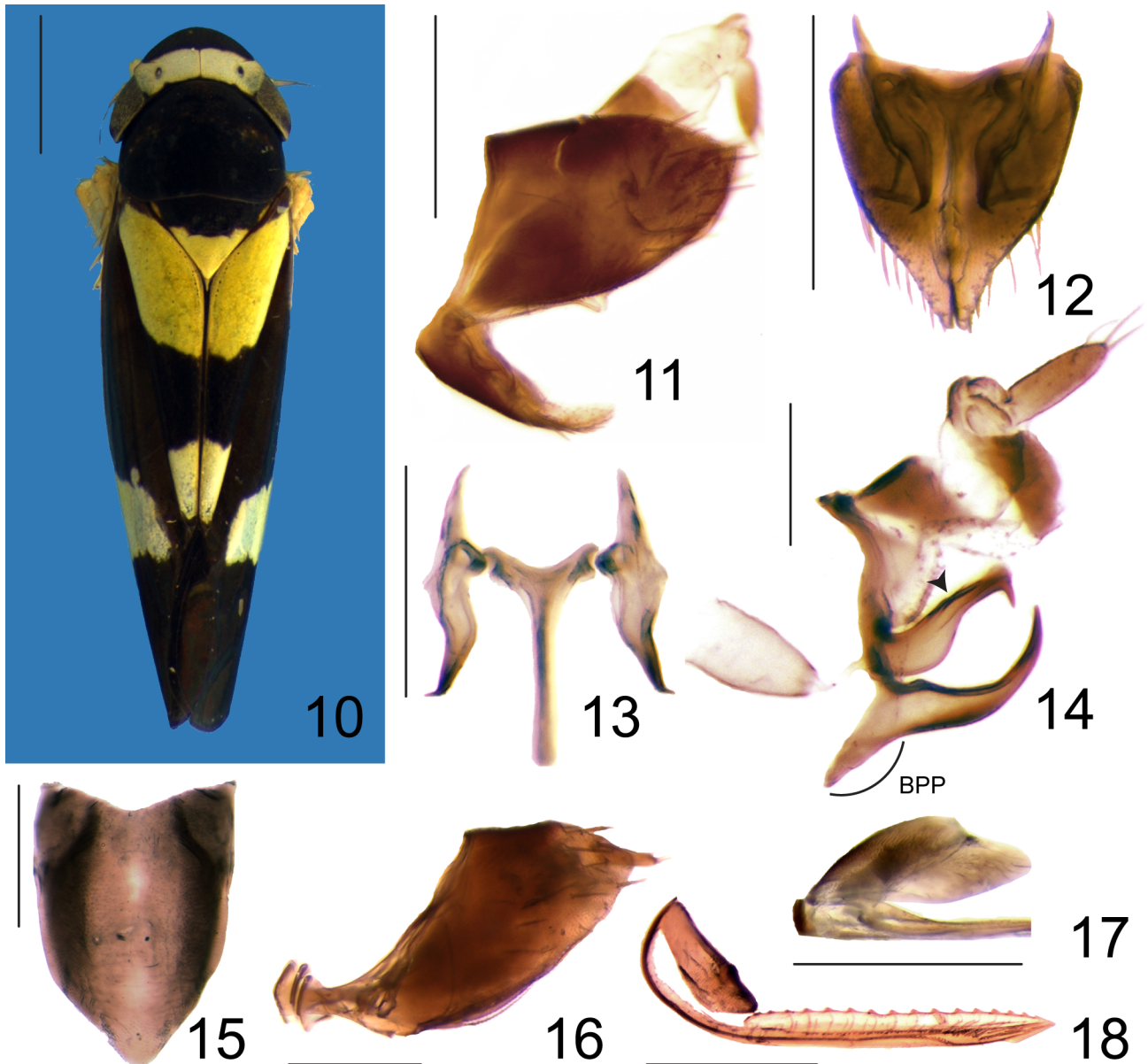
***Segonalia* Young, 1977**

(Figures 1–19)

Diagnosis. Small sharpshooters (4.3–5.5 mm, Figs 1, 10); pronotum narrower than transocular width (Figs 1, 10); male pygofer with apex acute (Figs 2, 11); valve and subgenital plates fused (Figs 3, 12); plates short, not extending posteriorly farther than midlength of pygofer, and separate from each other only at apical third (Figs 2, 11); connective Y-shaped and elongate, extending posteriorly much farther than apex of styles (Figs 4, 13); paraphysis present (Figs 5, 14).

***Segonalia steinbachi* Young, 1977**

(Figures 1–9)



FIGURES 10–18. *Segonalia machadoi* sp. nov. (paratypes from Parque Nacional de Sete Cidades, Piracuruca, Piauí State, Brazil). 10. dorsal habitus, female; 11. male genital chamber, lateral view; 12. valve and subgenital plates, ventral view; 13. connective and styles, dorsal view; 14. aedeagus, paraphysis, and anal tube, lateral view. 15. female sternite VII, ventral view; 16. female genital chamber, lateral view; 17. base of right first valvula of ovipositor and first valvifer, ventral view; 18. second valvula of ovipositor and second valvifer, lateral view. BPP= basal portion of paraphysis, scale bars = 1.0 mm (Fig. 10) and 0.5 mm (11–18).

Material examined. 2♂, “Paraguay\ 1985 \ R. Barragán” (DZUP); 5♂, “Brasil, Minas Gerais,\ PN [Parque Nacional] da Serra do Cipó 9–\ 13.XII.2011 (Malaise)\ Santana do Riacho,\ Córrego das Pedras”, “19°22’17”S\ 43°36’03”W 766m\ Monné, M.L.; Santos\ A.; Takiya, D.M. &\ Cavichioli, R.R.”, (DZUP); 6♂, same data as preceding, (DZRJ); 1♂, 2♀, “P.N. Serra do Cipó,\ MG, Brasil 19°20’35”S\ 43°37’08”W 09–\ 13.XII.2011\ R.R. Cavichioli leg.”, (DZUP); 1♀, “Brazil:\ Minas Gerais\ Santa Vitoria”, “II.1970\ F.M. Oliveira\ B.M. 1971-165”, (DZUP).

Measurements (length in mm). Males, 5.4–5.5 (5.2 in Young 1977). Females, 5.4–5.5 (5.3–5.5 in Young 1977).

Distribution. Santa Cruz (type locality), Bolivia; Brazil [new record]; Paraguay [new record].

Remarks. Young (1977, Figure 813c) illustrates the male pygofer of this species with a serrate ventral margin, but does not mention this characteristic in the description. Based on the study of our specimens, this serration is apparently due to the surface sculpturing of the pygofer, consisting of dentiform cuticular projections, which when observed on the pygofer margins give the impression of a serrate margin.

Furthermore, Young (1977) states that the characteristic unpaired paraphysis of *Segonalia* does not lie medially and is asymmetrical. Because the paraphysis connects to the aedeagus through a membrane, the position in relation to the aedeagus can vary and it may lie medially or laterally to the aedeagus (as originally illustrated). Nevertheless, its basal portion and ramus are structurally symmetrical. Therefore, specimens of *Segonalia* in Young’s (1977) key to genera of New World Cicadellini will not key out correctly given the *Segonalia* exit in couplet 87: “Paraphyses with a simple ramus that is not median”.



FIGURE 19. Live specimen of *Segonalia machadoi* sp. nov. at type locality (Parque Nacional de Sete Cidades, Piracuruca, Piauí State, Brazil). Photo by DMT.

***Segonalia machadoi* sp. nov.**

(Figures 10–19)

Material examined. Holotype, ♂, “Brasil, Piauí, PN [Parque Nacional] de\ Sete Cidades 4°5’57”S\ 41°42’34”W 193m\ 12.II.2013\ (sweep) DM Takiya” (CZMA). Paratypes, 2♂, 1♀, same data as holotype, (DZRJ); 1♂, 1♀, same data as holotype, (DZUP); 2♂, 1♀, “Brasil, Piauí, PN [Parque Nacional] de\ Sete Cidades 4°5’57”S\ 41°42’34”W 193m\ (YPT) [Yellow Pan Trap] 9–10.II.2013\ Oliveira M. &\ Somavilla A.”, (CZMA); 2♂, 1♀, same data as preceding, (INPA); 3♂, same data as preceding, (DZRJ); 3♂, 1♀, same data as preceding, (DZUP); 2♂, “FLONA Carajás–PA\ (Tarzan-Malaise/Mata)\ 30.I–05.II.2010\ Kumagai/Lopes/Lima col.”, (DZUP).

Measurements (length in mm). Holotype male, 4.3. Males, 4.3–4.8. Females, 4.9–5.0.

Description. Head (Fig. 10) with median length four-tenths of interocular width and three-tenths of transocular width. Crown (Fig. 10) slightly concave between ocelli; anterior fourth shagreen and posterior three-fourths smooth. Frons with muscle impressions distinct; median disk shagreen. Clypeus with superior portion shagreen. Genae smooth. Pronotum (Fig. 10) smooth with dorsopleural carinae complete; posterior margin straight or slightly concave. Hind legs with posterodorsal (PD) row of macrosetae with approximately 1.4x more cucullate setae than anteroventral (AV) row; AV row with approximately 2 short intercalaries between cucullate setae. Other structural characters as in the original description of *S. steinbachi* by Young (1977, p. 999).

Male pygofer (Fig. 11) moderately produced; surface with very small dentiform cuticular sculpturing (more concentrated near apex); macrosetae distributed in apical third; apex acute; processes absent. Valve fused to subgenital plates (Figs 11, 12); plates short, not extending posteriorly farther than midlength of pygofer; each subtriangular; plates separate from each other only at apical third of whole structure; uniseriate macrosetae along apical two-thirds of ventrolateral margins. Connective (Fig. 13) Y-shaped; shaft very long. Styles (Fig. 13) not extending posteriorly farther than apex of connective; narrowed and truncate apically; without anteapical lobe. Aedeagus (Fig. 14) with dorsal apodemes not as nearly as long as shaft; shaft elongate, directed posterodorsally, base broadened throughout basal half, dorsal lateral flanges restricted to median third; apex with a short ventral acute median process. Paraphysis (Fig. 14) with ramus tapered, curved dorsally, and acute at apex; basal portion (connected to connective, BPP in Fig. 14) approximately half length of ramus.

Female sternite VII (Fig. 15) well produced, gradually tapered to narrowly rounded apex. Internal sternite VIII mostly membranous, slightly sclerotized at connection to bases of first valvulae. Pygofer (Fig. 16) moderately produced; posterior margin acute; macrosetae distributed in apical half. First valvulae of ovipositor (Fig. 17) with bases rectangular and anterior margins truncated. Second valvulae of ovipositor (Fig. 18) slightly expanded throughout apical 3/4; dorsal margin of expanded area bearing approximately 15 continuous teeth; each tooth subtriangular and elongate with denticles throughout length; preapical area with denticles on dorsal and ventral margins; ventral prominence distinct; apex acute.

Coloration. Head (Fig. 10) black; crown with posterior two-thirds ivory (pale blue in life, Fig. 19); genae and apex of clypeus mostly yellow. Pronotum (Fig. 10) black. Mesoscutum (Fig. 10) black and scutellum yellow. Forewings (Fig. 10) dark brown to black; each with three yellow maculae: larger one at base of clavus, smaller one at apex of clavus, and oblique transverse band over bases of anteapical cells. Most thoracic sclerites and abdomen dark brown with pale areas. Legs yellow.

Etymology. The species epithet is given in honor of Dr. Angelo B. M. Machado on the occasion of his 80th birthday.

Remarks. *Segonalia machadoi* sp. nov. is very similar to the type species in color pattern and genitalia structure. It can be distinguished from the latter by the following features: (1) smaller size with males up to 4.8 mm (males longer than 5.4 mm in *S. steinbachi*); (2) male pygofer apex (Fig. 11) without a distinct apical unciform projection (present in *S. steinbachi*, Fig. 2); (3) aedeagus shaft (Fig. 14) with base broadened throughout basal half (broadened throughout basal third in *S. steinbachi*, Fig. 5) and lateral flange restricted to median third (extending more basally in *S. steinbachi*, Fig. 5); and (4) basal portion of paraphysis (Fig. 14) shorter than half length of ramus (longer than half length of ramus in *S. steinbachi*, Fig. 5). No significant differences were found between females of the two species (Figs 6–9, 15–18), which can only be separated by size and distribution.

The holotype and most paratypes of the new species were collected using yellow pan traps along a trail in Parque Nacional de Sete Cidades, a national park within the Caatinga biome. However, most of the areas where collecting was conducted had a Cerrado influence and one of those specimens was collected on *Croton* sp. (Euphorbiaceae).

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References

- Cavichioli, R.R. & Takiya, D.M. (2012a) Four species of the new Amazonian sharpshooter *Daedaloscarta* gen. nov. (Insecta: Hemiptera: Cicadellidae). *Zoologia*, 29, 589–597.
<http://dx.doi.org/10.1590/S1984-46702012000600010>
- Cavichioli, R.R. & Takiya, D.M. (2012b) Description of a new species of *Wolfniana* and new records of *Rotigonalia* (Hemiptera: Cicadellidae: Cicadellinae) from the state of Amazonas, Brazil. *Zoologia*, 29 (1), 85–88.
<http://dx.doi.org/10.1590/S1984-46702012000100011>
- Hamilton, K.G.A. (1981) Morphology and evolution of the rhynchotan head (Insecta: Hemiptera, Homoptera). *Canadian Entomologist*, 113, 953–974.
<http://dx.doi.org/10.4039/Ent113953-11>
- Mejidalani, G. (1998) Morfologia externa dos Cicadellinae (Homoptera, Cicadellidae): comparação entre *Versigonalia ruficauda* (Walker) (Cicadellini) e *Tretogonia cribrata* Melichar (Proconiini), com notas sobre outras espécies e análise da terminologia. *Revista Brasileira de Zoologia*, 15, 451–544.
<http://dx.doi.org/10.1590/S0101-81751998000200015>
- Oman, P.W. (1949) The Nearctic leafhoppers (Homoptera: Cicadellidae). A generic classification and check list. *Memoirs of the Entomological Society of Washington*, 3, 1–253.
- Rakitov, R.A. (1997) On differentiation of the cicadellid leg chaetotaxy (Homoptera: Auchenorrhyncha: Membracoidea). *Russian Entomological Journal*, 6 (3–4), 7–27.
- Young, D.A. (1968) Taxonomic study of the Cicadellinae (Homoptera: Cicadellidae), Part 1, Proconiini. *Bulletin of the United States National Museum*, 261, 1–287.
- Young, D.A. (1977) Taxonomic study of the Cicadellinae (Homoptera: Cicadellidae). Part 2. New World Cicadellini and the genus *Cicadella*. *Bulletin of North Carolina Agricultural Experiment Station*, 239, 1–1135.