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Article

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A new genus and species of Saccharosydnini (Hemiptera: Fulgoromorpha: Delphacidae) from Argentina

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Abstract

One new delphacid genus and species, *Lacertina australis* Remes Lenicov & Rossi Batiz, **gen. et sp. nov.** (Hemiptera: Fulgoromorpha: Delphacidae: Saccharosydnini), is described and illustrated from Argentina with distribution data and host plants data provided. The new genus is easily distinguished from all other genera of the Neotropical Saccharosydnini by being strongly dorsoventrally flattened with a wide vertex projecting 2/3 of its length beyond the eyes and the presence of two submedian carinae on frons. An identification key to the genera of Saccharosydnini is provided.

Key words: Auchenorrhyncha, new genus, new species, distribution, host plants, Argentina

Resumen

Se describe e ilustra un nuevo género y especie de delfácido, *Lacertina australis* Remes Lenicov y Rossi Batiz, **gen. et sp. nov.** (Hemiptera: Fulgoromorpha: Delphacidae: Saccharosydnini) y se incluyen datos de distribución y plantas hospederas de la Argentina. El nuevo género se distingue fácilmente de los Saccharosydnini neotropicales por su cuerpo muy aplanado y la conformación de la cabeza, con el vertex expandido y proyectado por delante de los ojos 2/3 de su longitud y por poseer dos carenas submedianas en la frente. También se presenta una clave para identificar los géneros de la tribu incluyendo al nuevo género monoespecífico.

Palabras clave: Auchenorrhyncha, nuevo género, nueva especie, distribución, plantas hospederas, Argentina

Introduction

The tribe Saccharosydnini (Hemiptera: Fulgoromorpha: Delphacidae: Delphacinae) encompasses *Neomalaxa* Muir, *Pseudomacrocorupha* Muir, both from the Neotropical region and *Saccharosydne* Kirkaldy, with only one species, *S. procerus* Matsumura described from Asia (Vilbaste 1968; Asche 1985). Members of the tribe can be recognized by the following characters: number of apical spines on posterior tibiae, 7 (2+5); hind wings with M stalked with Cu along almost all its length, and anal veins not distally forked; aedeagus elongate, elastic, coiled cephalad and ending in a short curved spine, and very closely connected with unarmed and reduced anal tube and theca base. These genera show similar external appearance but the shape and carination of the vertex and frons, the proportion of the head, which protrudes far beyond the anterior margin of the eyes, the relative length of antennal segments, and the male genitalia, particularly the shape of the parameres, are the most remarkable characteristics to distinguish them.

Presently, ten species of Saccharosydnini are known from the Neotropics, *Neomalaxa flava* Muir from Puerto Rico (Muir 1918), Guyana, Brazil, Ecuador, Trinidad (Metcalf 1943), Dominican Republic, Guyana, Panama, St. Lucia, Venezuela (University of Delaware, 2011); *Pseudomacrocorupha wagneri* Muir from Argentina (Muir 1930); *Saccharosydne brevirostris* Muir from Ecuador (Muir 1926); *S. gracillis* Muir from Brazil (Muir 1926); *S.*

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ornatipennis Muir from Brazil (Muir 1926), Guatemala, Panamá, St. Lucia (University of Delaware 2011); *S. rostifrons* (Crawford) from Cuba (Crawford 1914), Caribbean, St. Lucia (University of Delaware 2011); *S. saccharivora* (Westwood) from Grenada (Westwood 1833; Guagliumi 1953), Haiti, West Indies, Jamaica, Puerto Rico, Barbados, Trinidad, Cuba (Metcalf 1943; Guagliumi 1953; Arocha *et al.* 2005), Antigua, Antillas, British Guiana, Santo Domingo, USA, Venezuela (Guagliumi 1953), Colombia (Gómez & Lastra Borja 1995), Bahamas, Bermuda, Panama, St. Lucia, USA (FL, GA, HI, MD, NC, ?WI) (University of Delaware 2011); *S. subandina* Remes Lenicov & Rossi Batiz from Argentina (Remes Lenicov & Rossi Batiz 2010); and *S. viridis* Muir from British Guiana (Muir 1926), Brazil, Jamaica and Puerto Rico (University of Delaware 2011).

Records indicate that species of Saccharosydnini are most commonly found on grass (Poacea), including *Paspalum intermedium* (Muir 1926), *Andropogon glomeratus*, *A. bicornis* (Caldwell & Martorell 1951), water-bamboo (*Zizania caduciflora*) (Matsumura 1931; Yu *et al.* 2005), sugarcane (*Saccharum officinarum*) (Westwood 1833; Guagliumi 1953), pampas grass (*Cortaderia* spp.), rye (*Secale cereale*), garlic (*Allium sativum*) (Rossi Batiz & Remes Lenicov 2009) and rice (*Oryza sativa*). *S. saccharivora* is the only species of delphacids known as vector of phytoplasms (Arocha *et al*. 2005).

Due to the lack of complete agreement with anatomical features of any of the three Saccharosydnini genera presently known, a new genus and species, *Lacertina australis* Remes Lenicov & Rossi Batiz, gen. & sp. nov. is erected and described in this paper. The main diagnostic features are illustrated and information on geographical distribution and host plants are also given. A key to the genera of Saccharosydnini is also provided, since no keys were previously available.

Material and methods

Almost all studied adults were field collected on pampas grass from several provinces of Argentina. Some specimens were hand captured or using an aspirator on rye, rice and wheat. Individuals associated to garlic crops in productive areas from Mendoza and San Juan provinces were collected using a water trap and net. Both male and female genitalia of specimens were prepared for microscopic examination according to standard taxonomic techniques (Remes Lenicov & Virla 1993). Dissected parts were stored in microvials with glycerin.

The studied specimens are deposited in the Museo de La Plata (MLP), and two paratypes (one male and one female) of the new species are housed in the Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina (MBA).

The illustrations were drawn using a stereoscopic microscope with a camera lucida. Some of the illustrations were based on photos taken under a binocular stereoscopic microscopy fitted with a model SX210 IS Canon Power-Shot digital camera. We followed terminology from Asche (1985) and Yang & Yang (1986) to describe the head carination and the main morphological characters of male and female genitalia.

The measurements, derived from 10 specimens of each sex, are given as averages in millimetres and range within parentheses. Abbreviations are as follows: L., total length; B.L., body length; B.W., body width; t.l., tegmina length.

Taxonomy

Family Delphacidae

Tribe Saccharosydnini

Lacertina Remes Lenicov & Rossi Batiz, gen. nov.

Type species: *Lacertina australis* Remes Lenicov & Rossi Batiz, sp. nov.

Description. Fairly flat, broad and medium-sized delphacids.

Vertex large, apically conical and rounded in dorsal view; considerably protruded in front of eyes; carinae of vertex and frons distinct; each basal compartment of vertex as wide as eye in same line; Y-shaped carina exceeding

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anterior margin of eyes, submedian carinae widely separated, running parallel and converging at apex into a transverse carina; lateral carinae continuing on frons. Frons oval, length twice its maximum width; in profile, flat to slightly convex, basally reclined almost at a 30º angle; lateral carinae convex, submedian carina subparallel, divergent and less distinctive basally, delimiting a moderately inflated, snout-like area. Rostrum attaining middle coxae; subapical segment longer than apical segment. Antennae short, cylindrical, second segment longer than first segment, not reaching frontoclypeal suture. Pronotum relatively wide, about 3X as wide as long; pronotum and mesonotum combined slightly longer than vertex (1.20:1). Wings slender with rounded apex, about 5X longer than maximum width; hyaline, extending largely beyond abdomen. Spinal formula of hind leg: 7–8–4. Male and female genitalia see descriptions under *Lacertina australis* Remes Lenicov & Rossi Batiz, **sp. nov.** below.

Etymology. The generic name *lacertina* (feminine gender) comes from the Latin, meaning "pertaining to a lizard" and refers to the resemblance to lizards by the elongate shape of the head.

Remarks. This genus can be distinguished from all other known genera of Saccharosydnini by the vertex and frons tetra-carinated; body relatively flat and uniformly coloured; antennae short; male pygofer with strongly produced lateral margin, without ventral process; and male parameres divergent and apically obliquely truncate, with rounded internal and acute external angles.

Distribution. Argentina.

Key to genera of Neotropical Saccharosydnini

1. Frons with two submedian carinae . . . . . *Lacertina* Remes Lenicov & Rossi Batiz, **gen. nov.**
- Frons with one median carina 2
2. Forewings with Cu cell present, Sc cell absent . . . . . *Pseudomacrocorupha* Muir
- Forewings with Sc and Cu cells present 3
3. Antennae long, reaching far beyond middle of clypeus; submedian carina of vertex delimiting a subapical quadrate areolet . . . . . *Neomalaxa* Muir
- Antennae shorter, not surpassing base of clypeus; submedian carina of vertex forming a subtriangular areolet at apex . . . . . *Saccharosydne* Kirkaldy

Lacertina australis Remes Lenicov & Rossi Batiz, sp. nov.

(Figs. 1–5)

Holotype male. Uniformly light green -turning yellow when dry or preserved in alcohol; antennae with an antero-dorsally longitudinal dark stripe on basal segments; spur teeth and claws of hind legs, apical portions of parameres and anal tube, dark brown; eyes and ocelli yellowish.

Body slender and elongate. L.: 3.90 mm; B.L.: 2.65 mm. B.W.: 0.77 mm; t.l.: 2.90 mm.

Head (Fig. 1a–c) with eyes narrower than pronotum, slightly pointed in profile; vertex in middle line 2X longer than width at base, lateral margins subparallel, apical third regularly narrowed towards transition to frons, fastigium produced beyond eyes more than 2/3 of its length; submedian carinae subparallel on apical half, meeting together on apical margin and basally joined to arms of Y-shaped carina; basal compartment slightly concave as wide at base as maximum length and occupying approximately basal half; lateral carinae continuing along frons. Frons 3X longer than width at apex in anterior view, sides nearly straight, slightly constricted between eyes; with 2 percurrent, median frontal carinae which are close to each other on apical 2/3 and obscure and diverging on basal 1/3 delimiting a swollen interfrons. Clypeus longer than wide at base; clypeus plus labrum half length of frons. Rostrum attaining middle coxae; subapical segment longer than apical segment. Compound eyes elongate in lateral view. Antennae with scape and pedicel subcylindrical, slightly widened at apex; 1st segment about as long as broad; 2nd segment length twice its width and 3 times the 1st segment; number and arrangement of sensory fields of pedicel: 5–7 in groups of 3 rows.

Pronotum relatively wide, about 3X as wide as long, in middle line half the length of mesonotum, tricarinate, lateral carinae attaining hind margin which is medially excavated; lateral edges markedly expanded and slightly elevated at level of tegulae. Mesonotum narrow, slightly longer than broad, tricarinate; lateral carinae attaining hind margin; median carinae obscure on slightly depressed scutellum (Fig. 1a).

Wings (Fig. 2) slender with rounded apex, about 5 times longer than maximum width. Tegmina hyaline, mem-

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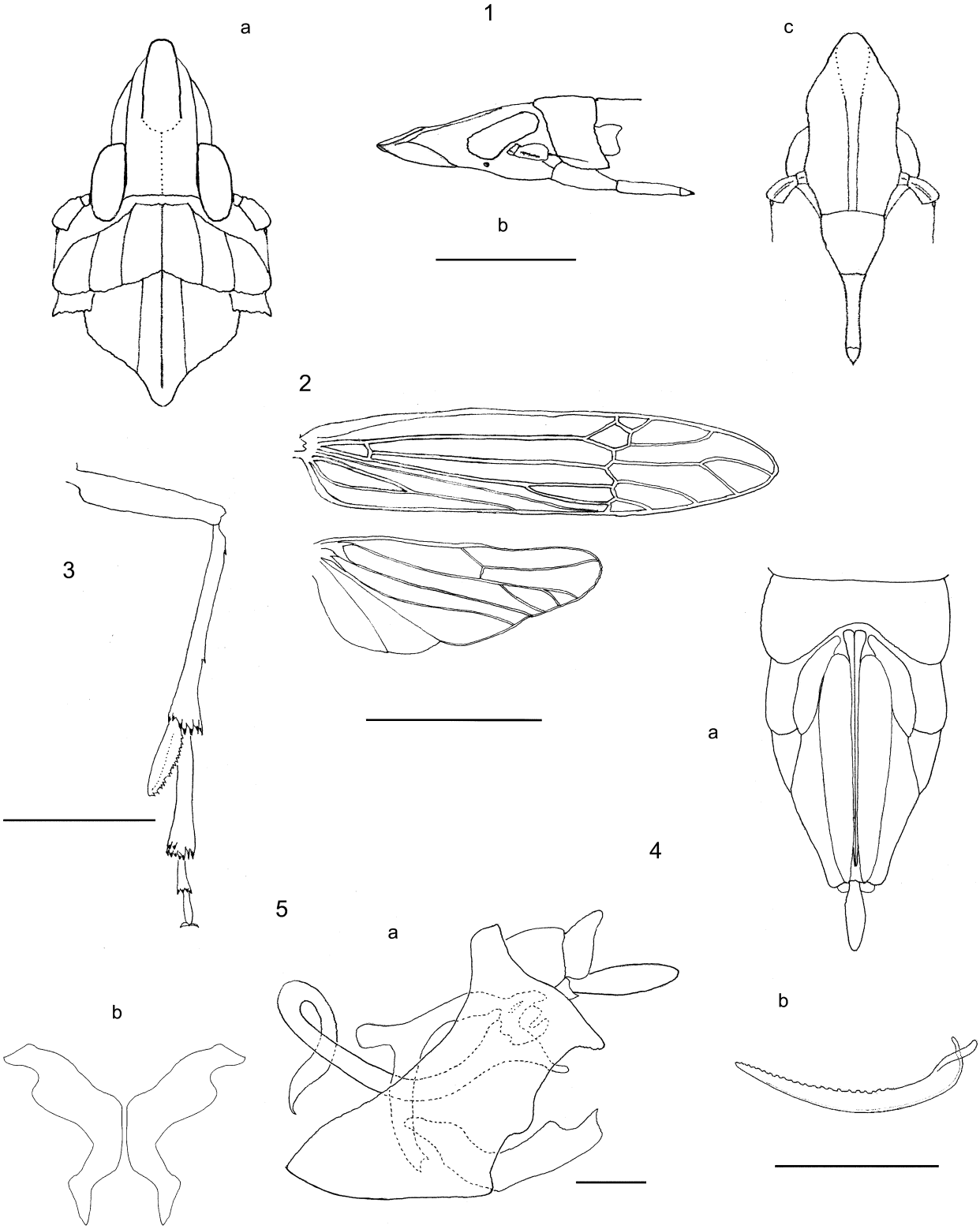
brane with microtrichiae, veins light green. Venation similar to *Saccharosydne* species; extra Cu1 branch present on hind wings in some specimens.



FIGURES 1–5. *Lacertina australis* Remes Lenicov & Rossi Batiz, **sp. nov.** 1. Head in dorsal (a), lateral (b) and frontal views (c). 2. Wings. 3. Leg III. 4. Female terminalia, ventral view (a), valvulae II, lateral view (b). 5. Male terminalia, lateral view (a), parameres, posterior view (b). Scale bars: Figs. 1, 3, 4 = 0.5 mm; Fig. 2 = 1 mm; Fig. 5 = 0.1 mm.

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Legs (Fig. 3) with posttibiae longer than postfemur, with 2 spines on outer margin and 7 (2+5) at apex. Posttibial spur leaf-like, with longitudinal submedian rib, half length of posttarsomere I; spur bearing 14–20 teeth (including apical tooth) on hind margin. Posttarsomere I almost 2X longer than posttarsomeres II + III, with 8 (2+6) apical spines; posttarsomere II with four apical spines.

Abdomen with 11 distinguishable segments.

Male drumming organ: 2nd abdominal tergite of male drumming organ with distinctly sclerotized, separated central plate.

Genitalia (Fig. 4a,b). Pygofer subcylindrical; dorsally with deeply concave anal emargination, reduced to narrow rim attached to basal margin of tenth segment; with produced dorsolateral angles in lateral view; ventral side much longer than dorsal; without medioventral process; diaphragm with dorsal margin V-shaped and ventrally concave. Genital "chamber" elongate, forming a dorsocaudally directed strut, connected with phallobase by two small lateral projections. Phallobase closely connected with anal segment by short saddle-shape suspensorium, and continued with well developed aedeagus. Aedeagus consisting of a short curved spine, basally projected as an elongate, slightly sclerotized elastic tube, coiled into pygofer, reaching 7th abdominal segment; phallotreme apical. Parameres elongate, distally diverging, dorsocaudally directed; in posterior view, narrow and closely approximate at base, inner margin slightly sinuate, outer margin deeply excavated near apex, apex obliquely truncate, with rounded internal and acute external angles; basally interconnected by V-shaped transverse strut. Connective 1.5 times as long as "chamber", Y-shaped at base, broadly fused to subapical basal portion of "chamber". Anal segment (10th segment) collar-like; 11th segment ventrally incomplete, anal tube elongate.

Measurements (n = 10). L.: 3.90 (3.70–4.10); B.L.: 2.65 (2.50–2.80); B.W.: 0.77 (0.70–0.85); t.l.: 2.90 (2.60–3.20).

Female. Coloration and external appearance similar to the male. L.: 4.55 mm; B.L.: 3.20 mm.

Genitalia (Fig. 5a,b). Ovipositor slender; valvulae I (or ventral valvulae) attaining anal segment in ventral view; valvulae II (median valvulae) in apical 3/4 with 18–20 rounded dorsal teeth, the proximal ones larger; valvulae III (dorsal valvulae) with microtrichiae, slightly surpassing pygofer and anal segment. Valvifers VIII slender, as long as half of dorsal valvulae. Anal segment (10th segment) collar-like, 11th segment ventrally incomplete; anal tube elongate.

Measurements (n = 10). L.: 4.55 (4.00–5.10); B.L.: 3.20 (2.90–3.50); B.W.: 0.92 (0.80–1.00); t.l.: 3.32 (3.10–3.55).

Etymology. The specific epithet *australis* refers to its geographical distribution in America.

Distribution. Argentina: Jujuy, Tucumán, La Rioja, San Juan, Mendoza, Entre Ríos, Córdoba, La Pampa, Buenos Aires, Neuquén and Río Negro provinces.

Host plants. Frequently found on pampas grass and garlic crop during spring and summer and occasionally on rye and rice (Rossi Batiz & Remes Lenicov 2009).

Type material. Holotype male: **ARGENTINA:** Buenos Aires: City Bell, 26/I/08, hand captured on pampas grass, Rossi Batiz leg. (MLP). Paratypes: **ARGENTINA:** 1 male, 5 females, same data as holotype; 2 males and 1 female, Buenos Aires, City Bell, 13/V/10, hand captured on pampas grass, Rossi Batiz leg.; 1 male, Buenos Aires, Poblet, 18/I/11, hand captured on pampas grass, Remes Lenicov leg.; 6 males and 4 females, Córdoba, Huerta Grande, 24/10/08, hand captured on pampas grass, Rossi Batiz leg. (all in MLP); 1 male and 1 female, Buenos Aires, City Bell, 26/I/2008, Rossi Batiz leg. (MBA).

Other material examined. ARGENTINA. Jujuy: Azul Pampa, 21/I/59, Torres-Dadone leg., 1 male, 2 females; Tucumán: Cerro San Javier, 20/V/08, hand captured on pampas grass, Virla leg., 1 male, 3 females and 1 nymph; La Rioja: Las Talas, 24/XII/07, hand captured on pampas grass, Virla leg., 7 females; San Juan: Dto. Pocito, 13–17/IX, 20–24/IX and 27/IX–01/X/04, with net on rye, Meneguzzi leg., 4 males, 4 females; Mendoza: "La Consulta", 22/VIII, 5/IX, 12/IX and 26/IX/03, 30/VIII–03/IX, 13–17/IX, 20–24/IX, 27/IX–01/X, 04–08/X, 18–22/X, 25–29/X, 22–26/XI, 29/XI–03/XII and 13–17/XII/04, 09–13/IX, 16–20/IX, 23–27/IX, 30/IX, 15/X, 22/X/02, 21/IX, 23/IX, 11/X, 17/X and 20/X/05, 25/VIII, 01/IX, 11/IX, 15/IX, 18/IX, 20/IX, 22/IX, 26/IX, 29/IX, 02/X, 09/X, 18/XII/06, 13/IX, 15/IX, 18/IX, 02/X and 12/X/06, with water trap on garlic, Lanati leg., 110 males, 93 females; Entre Ríos: 24/01/08, Dietrich leg., 1 female; Córdoba: Huerta Grande, 29/VI/08, hand captured on pampas grass, Virla leg., 4 males, 9 females and 1 nymph; San Marcos Sierras, 30/VI/08, hand captured on pampas grass, Virla leg., 2 males, 1 female; Mirador del Lago, 29/VI/08, hand captured on pampas grass, Virla leg., 4 males, 15 females and 1 nymph; Buenos Aires: Santa Catalina, 19/X/99, with net on grass, Remes Lenicov leg., 2 females; City Bell,

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26/I/08, hand captured on pampas grass, Rossi Batiz leg., 5 males, 1 female and 3 nymphs; Los Hornos, 11/I, 26/I/08 and 16/I/10, captured with net on rice, Rossi Batiz leg., 1 male, 2 females; La Pampa: Algarrobo del Águila, 10/II/08, hand captured on pampas grass, Virla leg., 1 male, 1 female; Santa Isabel, 10/II/08, hand captured on pampas grass, Virla leg., 1 male, 2 females; Neuquén: Cutral-Co, 10/II/08, hand captured on pampas grass, Virla leg., 1 male; Zapala, 10/II/08, hand captured on pampas grass, Virla leg., 1 male, 3 females and 1 nymph; Río Negro: Lago Mess, 07/II/08, hand captured on pampas grass, Virla leg., 4 females; El Bolsón, 04/II/08, hand captured on pampas grass, Virla leg. (all in MLP).

Remarks. We observed the intraspecific differences in the shape and carination of head and the colour pattern in the other known species of Saccharosydnini. However, the populations of *Lacertina australis* captured in various geographical argentinian areas -under quite different weather conditions- showed uniformity in colour, morphology and measurements.

This species can be distinguished from all other known species of Saccharosydnini by the following combination of characters: frons with two submedian carinae, interfrons distinctly swollen at base, male parameres with rounded internal and acute external apical angles, and the colour pattern as noted in the description.

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References

Arocha, Y., López, M., Fernández, M., Piñol, B., Horta, D., Peralta, E.L., Almeida, R., Carvajal, O., Picornell, S., Wilson, M.R. & Jones, P. (2005) Transmission of a sugarcane yellow leaf phytoplasma by the delphacid planthopper *Saccharosydne saccharivora*, a new vector of sugarcane yellow leaf syndrome. *Plant Pathology*, 54 (5), 634–642.

Asche, M. (1985) Zur Phylogenie der Delphacidae Leach, 1815 (Homoptera, Cicadina, Fulgoromorpha). *Marburger Entomologische Publikationen*, 2(1), 1–910.

Caldwell, J.S. & Martorell, L.F. (1951) Review of the Auchenorrhynchous Homoptera of Puerto Rico Part II. The Fulgoroidea except Kinnaridae. *Journal of Agriculture of the University of Puerto Rico*, 34, 133–269.

Crawford, L. (1914) A contribution toward a monograph of the homopterous insects of the family Delphacidae of North and South America. *Proceedings of the United States National Museum*, 46, 557–641.

Gómez, L.A. & Lastra Borja, L.A. (1995) Insectos asociados con la caña de azúcar en Colombia. El Cultivo de la Caña en la Zona Azucarera de Colombia. *Cenicaña*, 237–263.

Guagliumi, P. (1953) El saltahoja de la caña de azucar *Saccharosydne saccharivora* Westw. y la fumagina en Venezuela. *Ministerio de Agricultura y Cría. Instituto Nacional de Agricultura. Venezuela. Boletín Técnico No.7*, 82 pp.

Matsumura, M. (1931) 6000 Illustrated Insects of Japan-Empire. The Toko-Shoin, Tokyo. 1689 pp.

Metcalf, Z.P. (1943) *General Catalogue of the Hemiptera. Fascicle IV Fulgoroidea Part 3 Araeopidae (Delphacidae). Smith College, Northampton, Massachusetts, U.S.A.* 549 pp.

Muir, F. (1918) Homopterous notes II. *Proceedings of the Hawaiian Entomological Society*, 3, 426–427.

Muir, F. (1926) Contributions to our knowledge of south American Fulgoroidea (Homoptera). Part I. The family Delphacidae. *Bulletin of the Hawaiian Sugar Planters Association. Honolulu, Hawaii.* 18, 13–15.

Muir, F. (1930) On some South American Delphacidae (Homoptera, Fulgoroidea). *Entomologisk Tidskrift*, 51, 210–211.

Remes Lenicov, A.M.M. de & Virla, E.G. (1993) Homópteros auquenorrincos asociados al cultivo de trigo en la República Argentina. I. Análisis preliminar de la importancia relativa de las especies. *Studies on Neotropical Fauna and Environment*, 28(4), 211–222.

Remes Lenicov, A.M.M. de & Rossi Batiz, M.F. (2010) A new species of *Saccharosydne* Kirkaldy from Argentina (Hemiptera

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- Delphacidae). *Neotropical Entomology* 39(4), 584–589.

Rossi Batiz, M.F. & Remes Lenicov, A.M.M. de (2009) First record of the genus *Saccharosydne* Kirkaldy 1907 (Hemiptera - Fulgoromorpha - Delphacidae) in Argentina. *Interciencia - Journal of Science and Technology of the Americas, Venezuela*, 34(2), 127–129.

University of Delaware (2011) Online Delphacid Planthoppers Main Index. *http://ag.udel.edu/enwc/research/delphacid/species/Saccharosydnini.htm*.

Vilbaste, J. (1968) K faune tsikadovykh Primorskogo kraia. Über die Zikadenfauna des Primorje Gebietes. Valgus, Tallin, Estonia, 179 pp.

Westwood, J.O. (1833) Additional observations upon the insect which infests the sugar canes in Grenada. *The Magazine of Natural History [and Journal of Zoology, Botany, Mineralogy, Geology, and Meteorology]*, 6, 409–413.

Yang, J.-T. & Yang, C.-T. (1986) Delphacidae of Taiwan (I). Asiracinae and the tribe Tropidocephalini (Homoptera: Fulgoroidea). *Collected Papers on Homoptera of Taiwan, Taiwan Museum Special Publication Series* 6, 1–78.

Yu, X.-P., Chen, J.-M., Lu, Z.-X., Zheng, X.-S., Xu, H.-X. & Zhang, J.-F. (2005) Habitat manipulation in sustainable pest management in the rice ecosystem of the Yangtze River Delta, pp. 470–472. *In:* Toriyama, K., Heong, K.L. & Hardy, B. (eds.), Rice is life: scientific perspectives for the 21st century: proceedings of the World Rice Reseach Conference held at Tsukuba, Japan on 5–7 Nov 2004. Los Baños, Laguna: IRRI; Tsukuba, Japan.