

TRAGEDIANA CHUSQUEAE GEN. ET SP. NOV., A DELPHACINI (HEMIPTERA: FULGOROIDEA: DELPHACIDAE) FROM SOUTH CENTRAL CHILE

JUAN F. CAMPODONICO

*J.M. Perceval 10259, Vitacura, Santiago, Chile;
e-mail: juanfranciscocampodonic@gmail.com*

Abstract.— *Tragediana chusqueae* gen. et sp. nov. is described from the Andes and Nahuelbuta mountains in the south central zone of Chile. The genus is associated with *Chusquea* Kunth (Poaceae: Bambusoideae), and is characterized in part by having completely paired carinae on eumetope, a feature present in only a few genera among Delphacini.



Key words.— new genus, new species, Auchenorrhyncha, Fulgoromorpha, South America, Andean Region

INTRODUCTION

Delphacini is the most diverse tribe within the Delphacinae. This group is characterized by a flattened calcar, normally with teeth on the hind margin, phallus sclerotized (into a theca) with the base not strongly twisted, a differentiated suspensorium between phallus and segment X, and apodemes of sternum I directed dorsocaudad (Asche 1990). In Chile the tribe is currently composed of 23 species classified in 12 genera (even though some genus-level assignments are doubtful); among these, 14 species inhabit mainland Chile, and the remainder are restricted to the Juan Fernandez Islands (Muir 1929, Fennah 1957, 1965, Aguilera 1972, Gonzon and Bartlett 2007, Asche and Emeljanov 2016, Remes Lenicov and Brentassi 2017, Campodónico 2017a, 2017b).

The purpose of this contribution is to describe a new genus and species associated with *Chusquea* Kunth (Poaceae: Bambusoideae), which differs from the rest of currently known South American Delphacini by a remarkable carination of eumetope.

MATERIALS AND METHODS

Morphology mainly follows Asche (1985) but phallus is used for the male intromittent organ, segment X is used instead anal tube, segment XI instead of anal style and genital styles instead of parameres (=harpagones, claspers). Anufriev and Emeljanov (1988) are followed for head morphology, Bourgoin (1993) for female genitalia and Bourgoin *et al.* (2015) for wing venation. For observation of genitalia, the abdomen was cleared in a saturated KOH solution at room temperature for about 24 hours. After examination, the parts were stored in glycerin in a polyethylene microvial pinned below the respective specimen. Photographs were taken with a digital camera adapted to microscope. Measurements are given in millimeters; body length was taken not considering post-genital segments and body width was taken at level of tegulae. Five male and five female specimens were measured obtaining average and range (when applicable).

Material is deposited in the following collections:

- MNNC – Museo Nacional de Historia Natural, Santiago, Chile;
 MEUC – Museo Entomológico, Universidad de Chile, Santiago, Chile;
 JFCW – Juan F. Campodonico collection, Santiago, Chile;
 MLPA – Museo de la Plata, La Plata, Argentina;
 UDCC – University of Delaware Insect Research Collection, Newark, DE, USA.

RESULTS

Delphacidae Leach, 1815

Delphacinae Leach, 1815

Delphacini Leach, 1815

Tragediana gen. nov.
 (Figs 1–15)

Type species. *Tragediana chusqueae* sp. nov., here designated.

Diagnosis. Eumetope (Fig. 3) completely and coarsely bicarinate and devoided of sensorial pits; pygofer (Figs 6–7) not elongate, with caudally projected armature of diaphragm; genital styles (Figs 8–9) sigmoidal with tips apically convergent; segment X (Fig. 10) without processes.

Description. General body shape (Figs 1–2) oblong, more than twice longer than wide.

Head (Figs 1–4) subequal in width as pronotum. Macroscoryphe (Figs 1–2) wider than long; lateral margins subparallel; anterior side and posterior margin equal or almost equal in width; posterior margin of macroscoryphe straight, reaching eyes near mid length; coryphe composed of two pentagonal cells enclosed by carinae. Fastigium (Fig. 4) in lateral view roundly curved, then eumetope straight. Superior side of eumetope (Fig. 3) at fastigium roundly narrowed from lateral margins, then eumetope widest near level of lower margin of eyes; width of inferior margin (at metopoclypeal suture) as width of superior side (at fastigium). Median carinae of metope (Fig. 3) coarse, highly conspicuous, subparallel and converging on inferior margin of eumetope at metopoclypeal suture. Rostrum surpassing mesocoxae. Clypeus (Fig. 3) tricarinate; basal width about two thirds of length. Antennae (Fig. 3) with scape and pedicel terete, pedicel nearly twice longer than scape.

Thorax (Figs 1–2). Pronotum (Figs 1–2) subtrapezoidal, wider posteriorly; posterior margin slightly bisinuate, medially slightly concave; median carina distinct; lateral carinae more marked than median carina and curved laterally behind eyes, not reaching posterior margin. Mesonotum (Figs 1–2) with median

carina weak, fading near mid length; lateral carinae distinct.

Legs (Fig. 5). Metatibiae (Fig. 5) with one lateral tooth near tibiofemoral articulation and second slightly distad to mid length. Calcar (Fig. 5) with fine teeth on hind margin.

Male abdomen (Figs 6–10). Apodemes of sternum I well separated between each other. Pygofer (Figs 6–7) in lateral view quadrate (in shape of parallelogram), higher than long; in dorsal view wider than long (length excluding armature of diaphragm), with dorsal concavity of posterior margin broad and cranially surpassing mid length; opening with no ventral processes; diaphragm with strong, caudally projected armature. Suspensorium platelike, short (Fig. 10). Phallus (Fig. 10) subcylindrical, simple, upcurved. Genital styles (Figs 8–9) sigmoidal, apices directed mediad in acute inner angle. Segment X (Fig. 10) wider than long (dorsal view), without processes.

Etymology. Name is based on the locality where specimens were found for the first time: *Valle de las Tragedias* (Valley of Tragedies). The noun is feminine in gender.

Tragediana chusqueae sp. nov.
 (Figs 1–15)

Description. Measurements. Body length: male 2.6 (range 2.5–2.7); female 2.9 (range 2.8–3.0). Body width: male 0.8 (range 0.8–0.9); female 0.9.

Coloration (Figs 1–4) light yellowish brown on thorax, coryphe, most of legs, carinae of metope and clypeus, tonality of wings and most of abdomen of female; black to dark brown on most of abdomen of male, metope, clypeus, most of genae, longitudinal fringes of legs and usual spots on abdomen of female.

Head (Figs 1–4). Macroscoryphe (Figs 1–2) quadrate, length about five sixths of basal width; basal width as wide as anterior side, about two fifths of head total width; lateral margins indistinctly concave; cells of coryphe with rounded and slightly darkened in coloration foveolae. Eyes (Fig. 4) distinctly broader cranial of antennae; anterior height about six sevenths of length; notch occupying inferior two fifths of anterior height. Ocelli (Fig. 4) adjacent to lower margin of eyes. Genae (Fig. 4) slightly lighter ventrad of eyes. Eumetope (Fig. 4) with length about twice of maximum width; maximum width slightly before mid length from superior side; median carinae coarse, subparallel and converging at inferior border of eumetope, as separated between each other as distance from lateral margins at level of maximum width of eumetope. Pedicel (Fig. 3) with 14 sensory fields arranged in two rows of 4, two rows of 2 and remainder singly positioned apically.

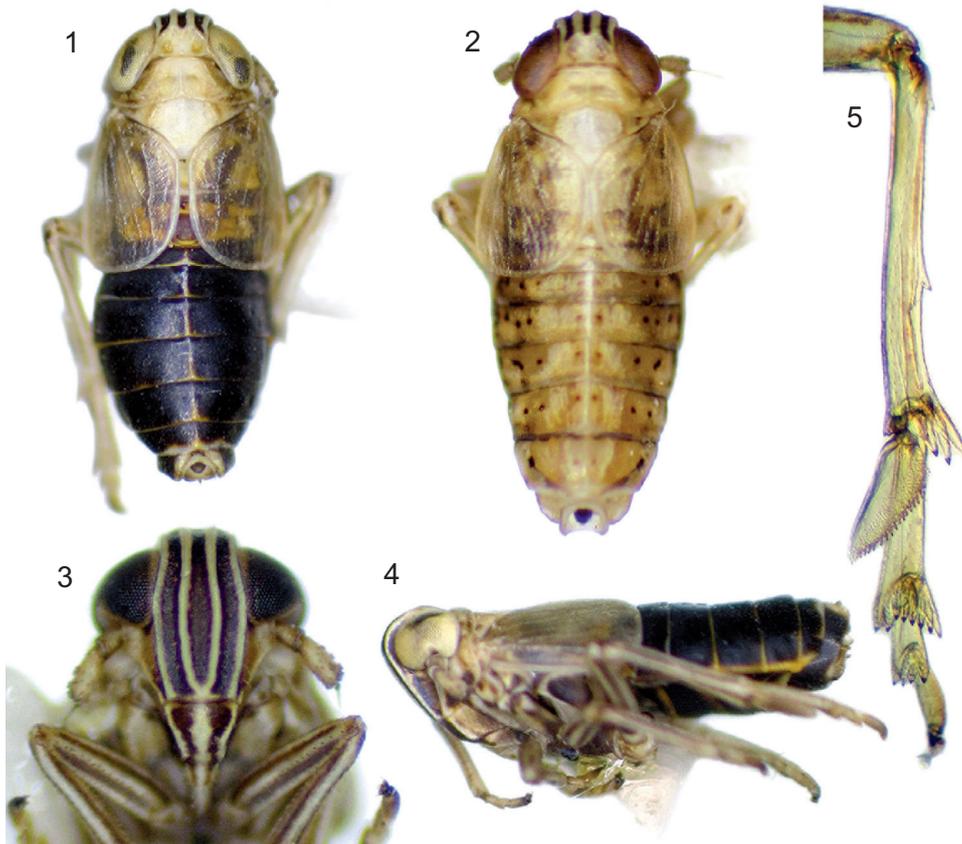
Thorax (Figs 1–2). Pronotum (Figs 1–2) with anterior margin nearly straight, width about two fifths of posterior width; median length about one fourth of posterior width; posterior width slightly wider than head. Mesonotum (Figs 1–2) with length from posterior margin of pronotum to apex about three sevenths of width. Tegulae short (brachypterous specimens).

Wings (Figs 1–2). Tegmina of brachypterous specimens usually not surpassing tergum IV; border whitish; veins concolorous; veins ScP+R and CuA usually branched. Hind wings of brachypterous specimens obsolete, spatulate.

Legs (Fig. 5). Longitudinally fringed. Apex of metatibiae with three outer and two inner teeth; outermost tooth separated from rest, next near same length of outermost, innermost smaller; inner teeth short and coarse, of about same length within each other. Calcar (Fig. 5) longer than two thirds of length of metabasitarsus (including spines); hind margin with about 20 teeth, smoothly curved basad; fore margin slightly curved near apex and base, medially straight. Metabasitarsi (Fig. 5) slightly longer than half of length of metatibiae; apex with five outer and two inner teeth; outer teeth

slightly and gradually reducing size from outermost to innermost; inner teeth about same size within each other, positioned slightly distad of outer teeth. Second metatarsomeres (Fig. 5) about two fifths of length of metabasitarsi; apex with four teeth.

Male abdomen (Figs 6–10). Apodemes of sternum I slightly directed laterad, caudally almost reaching upper level of lateral sides. Pygofer (Figs 6–7) in lateral view with length (excluding ridge of diaphragm) about four sevenths of basal height; dorsal and ventral surfaces inclined dorsad; in caudal view slightly wider than high; in dorsal view indistinctly convex on caudal half of lateral surfaces, anterior margin of dorsal surface with small notch; armature of diaphragm with long (caudally projected) median ridge; ridge from lateral view notched; superior margin of armature of diaphragm obtusely incised (for reception of phallus in repose). Phallus (Figs 10) tubular, broader and slightly curved upward on basal half, then straight; gonopore broad, on left lateral side of apex; two ventrolateral rows of 4–5 teeth, right row with teeth more separated. Genital styles (Figs 8–9) basally diverging, broad on inferior half (basal angle weak), narrowed subapically,



Figures 1–5. *Tragediana chusqueae* sp. nov.: (1) male, habitus, dorsal view; (2) female, habitus, dorsal view; (3) male, anterior part of body, cranioventral view; (4) male, habitus, lateral view; (5) male, hind leg.

with outer apical angles rounded, and inner apical angles acute and converging. Segment X (Fig. 10) short, in dorsal view indistinctly narrowed at middle, about four-fifths as long as wide; in lateral view with ventral surface longer than dorsal surface; from caudal view circular, slightly pentagonal. Segment XI (Fig. 10) nearly as long as segment X.

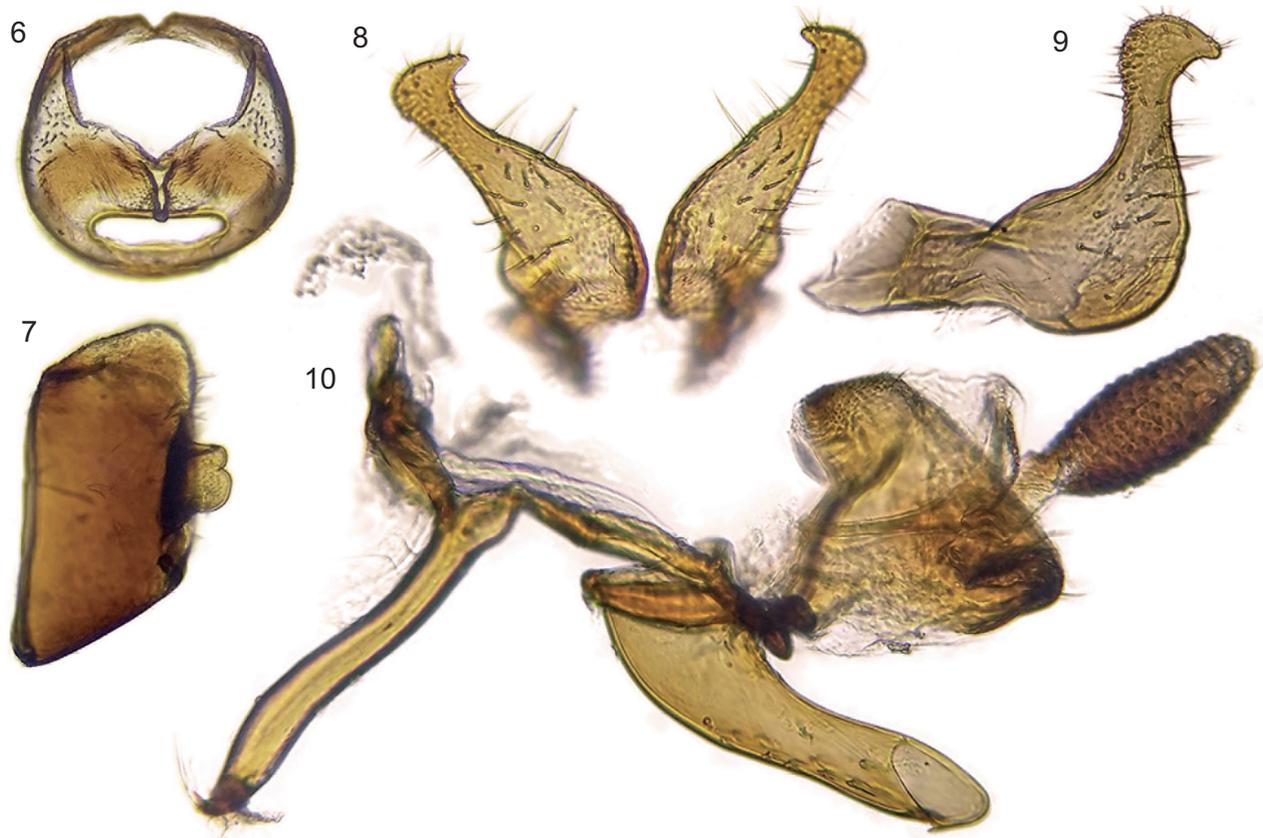
Female abdomen (Figs 11–15). Gonopods (Fig. 11) more than seven times longer than wide; apex rounded; dorsal margin entire on distal two thirds. Gonapophyses IX (Fig. 12) with about 30 teeth on distal three fifths of dorsal margin slightly serrated caudad, basally more obtuse, abruptly reduced and indistinct at apex. Gonapophyses VIII (Figs 13–14) longitudinally with slight marked striae; striae turning transverse at apex. Gonocoxa VIII (Fig. 15) about four times longer than wide; basal angle slightly acute; distal angle acuter; anterior margin bisinuate, with basal convexity shorter and more produced. Segment X slightly wider basally; length about one half of basal width; slightly longer than high; ventral surface greatly longer than dorsal surface, with posterior margin

slightly concave. Segment XI nearly as long as segment X.

Types. [All specimens brachypterous]. Holotype: male, Chile, [Bío Bío reg.], Ñuble prov., Valle de las Tragedias, 36°36'S. 71°12'W., 1900 m., 9-10.I.2015, J.F. Campodonico leg., on *Chusquea* sp. (MNNC); Paratypes: Chile, Ñuble prov., Valle de las Tragedias, 36°36'S. 71°12'W., 1900 m., 9-10.I.2015, J.F. Campodonico leg., on *Chusquea* sp. 2 males, 2 females (MNNC), 2 males, 2 females (MEUC), 1 male (MLPA), 1 male, 1 female (UDCC), 2 males, 2 females (JFCW); Chile, [Maule reg.], Talca prov., Vilches, 7.XII.2015, M. Cid A. leg. 1 male (JFCW); Chile, [Araucanía reg.] Malleco prov., Nahuelbuta, Vegas Blancas, Los Corrales, 37°48'S. 72°56'W., 950 m., 25-26.I.2017, J.F. Campodonico leg., on *Chusquea* sp. 1 male (MNNC), 1 male (JFCW).

Etymology. The specific name refers to the host plant, genus *Chusquea* Kunth.

Natural history. All specimens found on high altitudes in Andes and Nahuelbuta mountain ranges. *T. chusqueae* is associated with *Chusquea* Kunth (Poaceae: Bambusoideae).



Figures 6–10. *Tragediana chusqueae* sp. nov., male genitalia: (6) pygofer, caudal view; (7) pygofer, lateral view; (8) genital styles, caudal view; (9) left genital style, laterocaudal view; (10) phallic complex (excluding genital styles), lateral view.

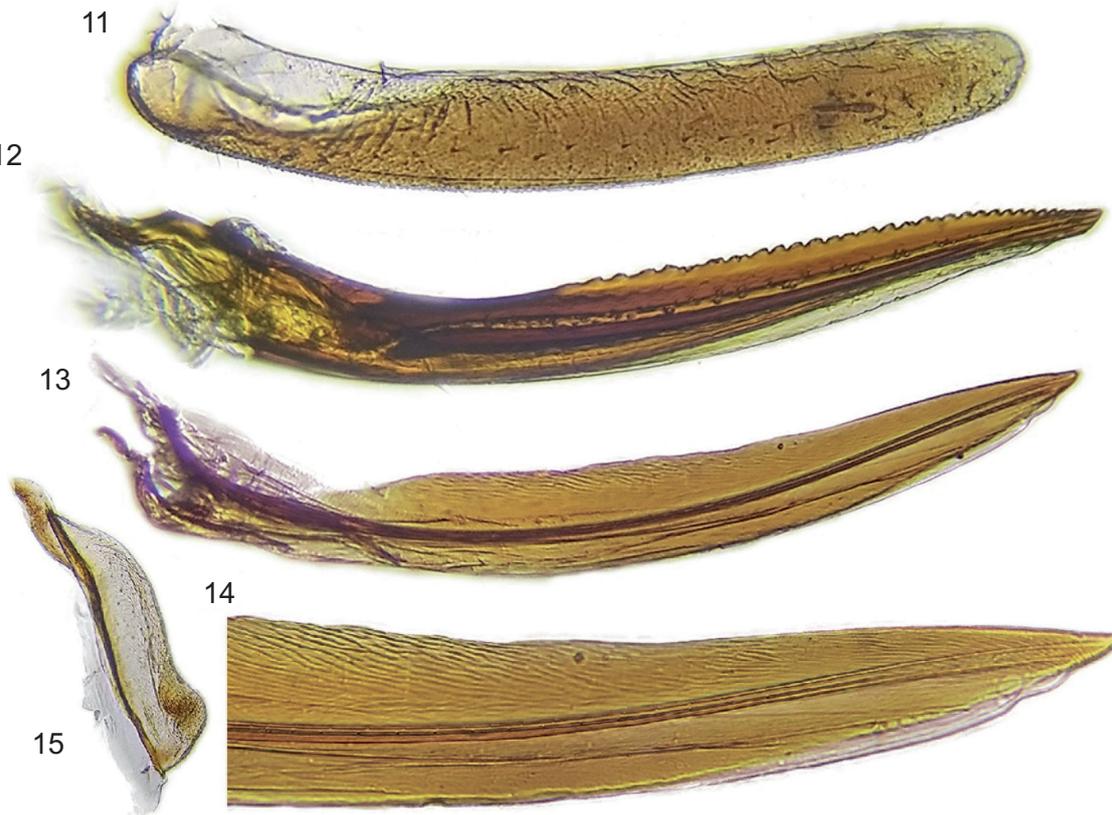
DISCUSSION

Tragediana is the first South American Delphacini genus with a fully bicarinate eumetope. Among New World Delphacini, this feature is shared with *Criomorphus* Curtis, 1833, *Achorotile* Fieber, 1866, and the monotypic genus *Macrotomella* Van Duzee, 1907, distributed in the Northern Hemisphere (Bartlett *et al.* 2014). These genera can be separated from *Tragediana* by the following features: *Macrotomella*, by the presence of processes in the segment X and rather elongate pygofer; *Criomorphus*, by the presence of processes in the segment X; and *Achorotile*, by the presence of processes in the segment X and its characteristic sensory pits in the metope. Additionally, *Macrotomella* bears a contrasting pale coloration in carinae and in abdominal markings of brachypterous specimens and *Criomorphus* presents contrasting pale coloration on apex of tegmina of brachypterous specimens, while *T. chusqueae* lack ornamentation on coloration pattern.

The closer South American taxon due to the carination of eumetope is *Neodelphax* Remes Lenicov et

Brentassi, 2017, which presents the carina forked near level of antennae. This taxon also differs from *Tragediana* by the armature of diaphragm not produced into a ridge, genital styles apically produced laterad, and segment X possessing a pair of processes. Additionally, it occurs in different habitats and hosts than *Tragediana chusqueae* (Remes Lenicov and Brentassi 2017).

Endemism is low in the continental fauna of Chilean Delphacini: *Sparnia edwardsi* Muir, 1927; *Delphacodes darwini* Muir, 1929; *Delphacodes chiloensis* Muir, 1929 and *Astatometopon sakakibarai* Campodonico, 2017 have only been recorded for mainland Chile. *Neodelphax acheron* (Fennah, 1957) is also present in Juan Fernandez islands and *Nothodelphax atlanticus nigrescens* Fennah, 1965 was described from the far south (the nominal subspecies is distributed over Atlantic islands). The rest of the species are present also in other South American countries and *Metadelphax propinqua* (Fieber, 1866) and *Peregrinus maidis* (Ashmead, 1890) are cosmopolitan (Muir 1929, Fennah 1965, Aguilera 1972, Gonzon and Bartlett 2007, Asche and Emeljanov 2016, Remes Lenicov and Brentassi, 2017, Campodonico 2017a, 2017b).



Figures 11–15. *Tragediana chusqueae* sp. nov., female genitalia: (11) abdomen, ventral view; (11) gonoplac; (12) gonapophysis IX; (13) gonapophysis VIII; (14) detail of gonapophysis VIII; (15) gonocoxa VIII.

Tragediana is the second genus of Delphacini recorded only to Chile (even though species currently classified in Delphacodes require reassignment). However, *Tragediana chusqueae* may be found in Argentina, as it was collected at high altitudes in the Andes Mountains.

ACKNOWLEDGEMENTS

I thank Mauricio Cid Arcos for providing a specimen, Charles Bartlett and Thierry Bourgoïn for their suggestions to this contribution, Eduardo I. Faúndez for his reading of an early version of the manuscript. Mauricio Cid Arcos, Francisco Urrea, Jorge Pérez Schultheiss, and Andrés Fierro are thanked for organization and company during entomological expeditions. Part of material studied was collected during the January 2017 expedition to Nahuelbuta of the MNNC.

REFERENCES

- Aguilera, A. 1972. Colección entomológica del Centro de Investigación y Capacitación Agrícola (CICA), Arica. Nuevas determinaciones. II contribución. *Idesia*, 2: 99–116.
- Anufriev, G. A. and A. F. Emeljanov. 1988. [Suborder Cicadinea (Auchenorrhyncha)], pp. 12–495. *In*: P. A. Ler (ed.). [Keys to the insects of the Far East of the USSR in six volumes. Volume II Homoptera and Heteroptera]. Nauka, Leningrad, 972 pp. (In Russian).
- Asche, M. 1985. Zur Phylogenie der Delphacidae Leach, 1815 (Homoptera: Cicadina: Fulgoromorpha). *Marburger Entomologische Publikationen*, 2: 1–910.
- Asche, M. 1990. Vizcayinae, a New Subfamily of Delphacidae with Revision of *Vizcaya* Muir (Homoptera: Fulgoroidea) — a Significant Phylogenetic Link. *Bishop Museum occasional papers*, 30: 154–187.
- Asche, M., and A. F. Emeljanov. 2016. Review of the Neotropical genus *Sparnia* Stål (Hemiptera, Fulgoroidea: Delphacidae). *Entomological Review*, 96(9): 1209–1233.
- Bartlett, C. R., O'Brien, L. B. and S. W. Wilson. 2014. A review of the planthoppers (Hemiptera: Fulgoroidea) of the United States. *Memoirs of the American Entomological Society*, 50: 1–287.
- Bourgoïn, T. 1993. Female genitalia in Hemiptera Fulgoromorpha, morphological and phylogenetical data. *Annales de la Société Entomologique de France (Nouvelle Serie)*, 29(3): 225–244.
- Bourgoïn, T., Wang, R. R., Asche, M., Hoch, H., Soulier-Perkins, A., Stroiński, A., Yap, S. and J. Szewdo. 2015. From micropterism to hyperpterism: recognition strategy and standardized homology-driven terminology of the forewing venation patterns in planthoppers (Hemiptera: Fulgoromorpha). *Zoomorphology*, 134(1): 63–77.
- Campodonico, J. F. 2017a. New distributional records of Delphacidae (Hemiptera: Fulgoroidea) from Chile. *Arquivos Entomológicos*, 17: 119–128.
- Campodonico, J. F. 2017b. *Astatometopon sakakibarae* gen. & sp. nov., a montane planthopper from Chile (Hemiptera: Fulgoroidea: Delphacidae). *Acta Entomologica Musei Nationalis Pragae*, 57(1): 1–10.
- Fennah, R. G. 1957. Los insectos de las Islas Juan Fernández 29. Fulgoroidea. *Revista Chilena de Entomología*, 5: 375–384.
- Fennah, R. G. 1965. Fulgoroidea from Southern Chile (Hemiptera). *Bulletin of the British Museum (Natural History), Entomology*, 17: 233–272.
- Gonzon, A. T. and C. R. Bartlett. 2007. Systematics of *Hadropygus* n.g., *Metadelphax* Wagner and New World *Toya Distant* (Hemiptera: Delphacidae). *Transactions of the American Entomological Society*, 133(3): 205–277.
- Muir, F. 1929. New and little-known South-American Delphacidae (Homoptera, Fulgoroidea) in the collection of the British Museum. *Journal of Natural History*, 3(13): 75–85.
- Remes Lenicov, A. M. M. and M. E. Brentassi. 2017. New taxa and combinations in Neotropical Delphacini (Hemiptera: Fulgoroidea). *Zootaxa*, 4281(1): 280–290.

Received: April 3, 2017

Accepted: May 31, 2017