



Biodiversity of the Neotropical Larginae (Hemiptera: Pyrrhocoroidea: Largidae): Description of a new genus and new species

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Abstract: A new genus of Larginae (Largidae), *Parvacinocoris*, is described to include a new species from Argentina and Paraguay, and *P. stehliki* (Doesburg) new combination, a species previously placed in *Acinocoris*, previously known from Surinam and Venezuela and in this paper recorded also from Brazil, Colombia and Guatemala. This new genus is similar to *Acinocoris* however it may be separated by the smaller size, the shorter antennae, the immaculate abdominal sterna, the shape of the parameres, and the presence of a pair of hook-like processes on the aedeagal conjunctiva. Photographs of dorsal and lateral habitus of both sexes as well as the male genitalia of the new species are included.

Key words: *Parvacinocoris* n. gen., *P. khuru* n. sp., *P. stehliki* n. comb., new records.

INTRODUCTION

The importance of insects is based on their diversity, ecological role, and influence on agriculture, human health, and natural resources (Scudder 2017). The number of insects described at present is more than 1 million and estimated to be 5.5 million, and about 1.6 million of them should be found in the Neotropics (Stork 2018). The Heteroptera, or true bugs (Hemiptera) represent the largest and most diverse group of hemimetabolous insects, including seven infraorders and 91 families with more than 45.000 known species (Henry 2017).

The Largidae, also known as bordered plant bugs, are a small group of heteropterans with a cosmopolitan distribution (Schuh and Slater

1995). They are often aposematically colored and are either ground-dwelling or associated with the vegetative parts of shrubs, trees and forbs (Cassis and Gross 2002). All of the species included in the family are phytophagous, feeding on reproductive parts of plants; most of the data about hostplants of the Neotropical fauna is associated with species of *Largus* Spinola and the most common species of *Acinocoris* Hahn, *A. lunaris* (Gmelin) (Melo and Dellapé 2013).

The family includes 24 genera placed in two subfamilies: Physopeltinae known from the Old World, and Larginae from the New World (Dellapé and Melo 2014). The Larginae have been defined by variable characters, although most authors mentioned the non-sulcate profemur, the absence of a depression behind the buccula, and the New World distribution. This subfamily includes 15 genera that have been divided into three tribes:

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Araphini, with two genera (*Arhapha* Herrich-Schaeffer and *Pararhapha* Henry), defined by myrmecomorphic characters; Largini with four genera (*Armilargulus* Stehlík and Jindra, *Largulus* Hussey, *Neolargulus* Stehlík and Brailovsky, and *Paralargulus* Stehlík and Brailovsky) that share a particularly shaped pygophore; and Largini that includes nine genera (*Acinocoris*, *Fibrenus* Stål, *Largus*, *Lecadra* Signoret, *Rosaphe* Kirkaldy and Edwards, *Stenomacra* Stål, *Thaumastaneis* Kirkaldy and Edwards, *Theraneis* Spinola, and *Vasarhelyecoris* Brailovsky and Barrera) defined by lacking the characters found in the other tribes. Although the genera are well defined, except for the large genus *Largus* that likely is not monophyletic, the generic relationships have never been studied, and the placement of genera within the tribes varies, with *Thaumastaneis* and *Vasarhelyecoris* included in either Araphini or Largini, depending on the author (Schaefer 2000, 2015, Stehlik and Kment 2011, Stehlik 2013, Rosas and Brailovsky 2016).

In this contribution, we describe a new genus of Larginae to include a new species from Argentina and Paraguay, and *Acinocoris stehliki* Doesburg previously known from Surinam and Venezuela and in this paper also recorded from Brazil, Colombia and Guatemala. This article has been registered in the Official Register of Zoological Nomenclature (ZooBank) as <http://zoobank.org/D9FEC9DC-ED30-44EA-99B1-D877910D8354>.

MATERIALS AND METHODS

The specimens studied are deposited in the entomological collections of the Museo de La Plata, Buenos Aires, Argentina (MLP); the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia, Buenos Aires, Argentina (MACN); the Instituto Fundación Miguel Lillo, San Miguel de Tucumán, Tucumán, Argentina (IFML); the National Museum of Natural History, Smithsonian

Institution, Washington, DC, USA (NMNH); and the Instituto de Biología, Universidad Nacional Autónoma de México, México City, Mexico (UNAM). All measurements are given in millimeters. The genital structures were dissected under a stereomicroscope, cleared in a 10% KOH solution, washed in distilled water, and preserved in vials with glycerin. Photographs were captured using a digital camera (Micrometrics 391CU, 3.2 m) mounted on a Nikon SMZ1000 stereomicroscope. Multiple focal planes were merged using Micrometrics SE Premium4 software. Plates were created and numbered in Corel Draw X8. The map was built using the QGIS 3.2, localities were georeferenced with Google Earth Pro.

RESULTS

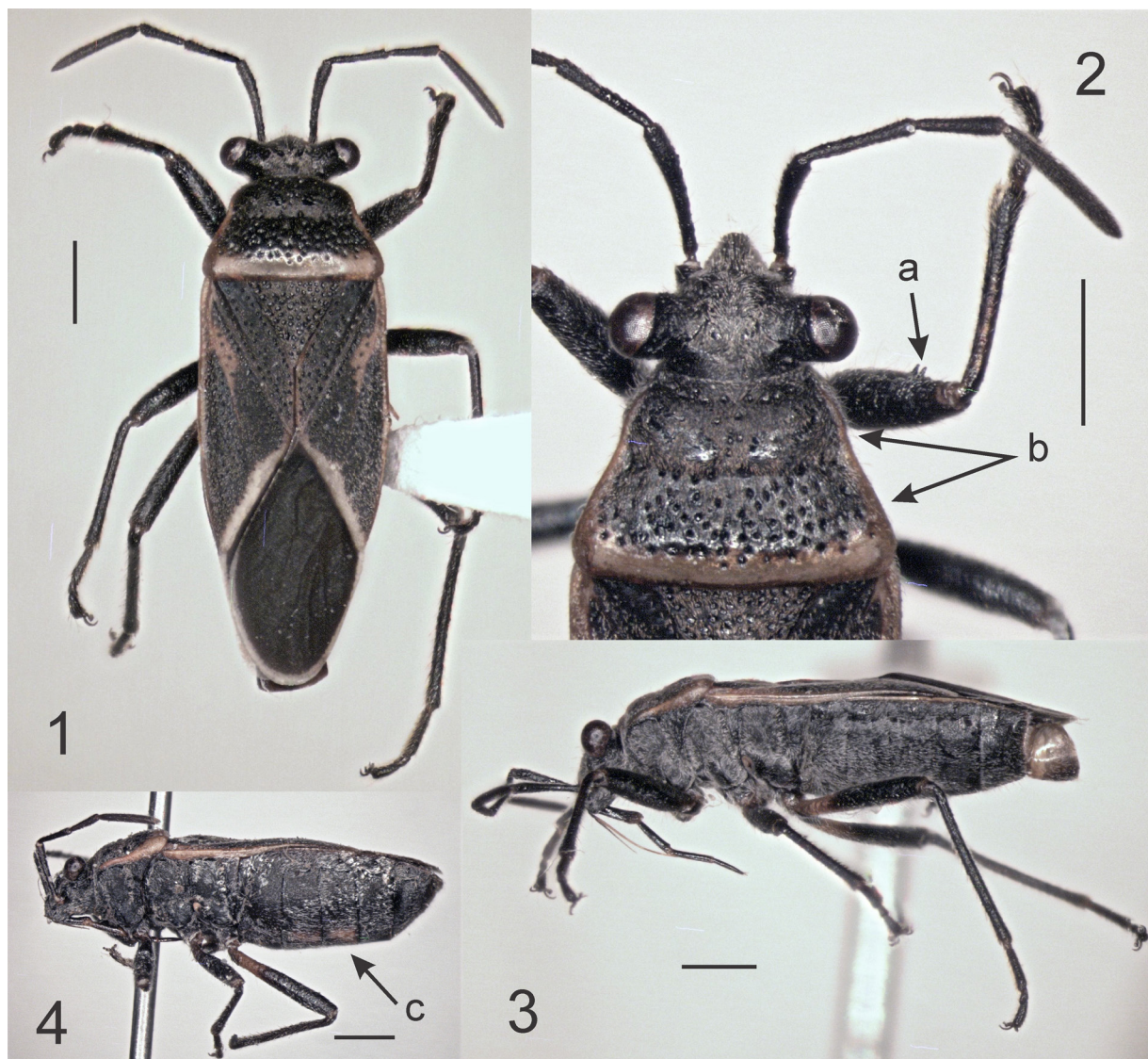
Parvacinocoris, new genus

<http://zoobank.org/E50B0E48-779E-4AA5-9B5D-8D0489907A36>

Type species: *Parvacinocoris khuru*, new species

Diagnosis. Small species with abundant short silvery setae. Scape shorter than pedicel + basiflagellomere length. Profemur with 1 or 2 small spines distally, rest of legs unarmed. Abdomen dark, without large pale macula. Paramere short, with a wide shank and a large and acute blade. Presence of a posterior hook-like process on aedeagus.

Description. Small species, less than 7.5 mm. Body with abundant short silvery setae. Body elongate, external corial margin straight. Head narrower than width of pronotum at humeral angles. Eyes pedunculate (Figs. 1, 2). Antenna relatively short, scape shorter than pedicel + basiflagellomere length. Labium reaching mesocoxae. Buccula rounded. Collar distinct. Anterior lobe of pronotum shorter than posterior lobe, never sexually dimorphic (Fig. 2). Lateral margins of pronotum rounded, not carinated. Posterior lobe of pronotum with abundant punctures, more abundant than on anterior



Figures 1-4 - *Parvacinocoris khuru*, n. sp. **1-3**. Male holotype: **1**. Dorsal view; **2**. Detail of head and pronotum; **3**. Lateral view; **4**. Female paratype, lateral view. Arrows: **a**. Spines on profemur, **b**. Anterior and posterior pronotal lobes, **c**. Female abdomen. Scale line 1 mm.

lobe (Fig. 2b). Metapleural scent gland auricle contrastingly colored with background (Figs. 3, 4). Procoxa unarmed. Profemur with 1 or 2 small spines distally (Fig. 2a), rest of legs unarmed. Scutellum uniformly punctate. Stridulatory structures absent on corium, metafemur or abdomen. Abdomen dark, without large pale macula. Paramere short, with a wide shank and a large and acute blade.

Etymology. The generic name is formed from the Latin *parvus*, meaning little, in reference to the

small size, in combination with the generic name *Acinocoris* to denote the overall similarity of the two genera.

Distribution. Argentina, Brazil, Colombia, Guatemala, Paraguay, Surinam, and Venezuela.

Discussion. *Parvacinocoris* n. g. is similar to *Acinocoris* in general appearance, but the species included in the latter genus are larger, less setose, the antenna is longer with the scape longer than pedicel + basiflagellomere, the abdomen has large distinct

pale maculae in both sexes, and the parameres are more elongate with a narrower shank and the blade is smaller and less acute (Fig. 12). Study of the male genitalia in the Larginae, including species of *Acinocoris*, shows that the parameres and aedeagus possess good generic characters. The aedeagus of *P. khuru* n. sp. shows remarkable differences from species in other genera (Figs. 9, 10), particularly the presence of a posterior hook-like process that is unique among the subfamily. In a preliminary phylogenetic analysis of the subfamily Larginae (unpublished data), these two genera together with *Rosaphe* constitute a monophyletic group supported mainly by the shape of the metapleural scent gland auricle that is rounded and raised from the metapleural sclerite; with *Parvacinocoris* n. g. as the sister group of *Acinocoris* + *Rosaphe*.

The distribution of both species in this new genus (Fig. 14) shows that *Parvacinocoris* n. g. is mainly tropical, with *P. khuru* n. sp. also known from northeastern regions of Argentina.

Parvacinocoris khuru, new species

<http://zoobank.org/F68C89A8-8155-4232-B81D-DE1DA3489AD3>

(Figs. 1–11, 14)

Diagnosis. Antenna black. Labium black. Hemelytra black with an orange macula on median fracture, and a wide whitish fringe adjacent to membrane. Legs black, except base of meso- and metafemora paler.

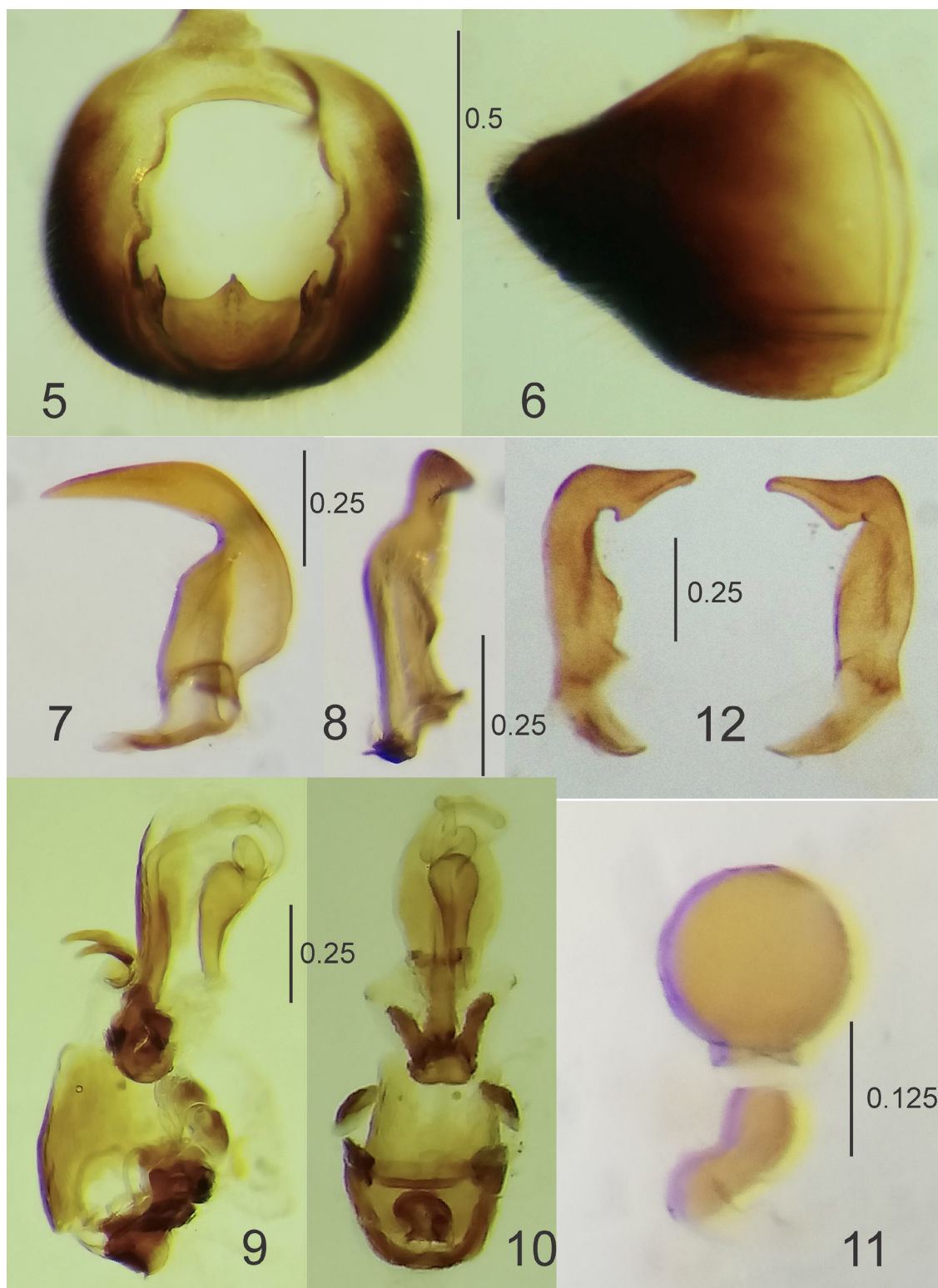
Description of holotype. Total length 6.65. Head length 1.12, head width 1.60, interocular space 1.00. *Head* black, covered with abundant short silvery setae, and long erect setae dorsally. Antenna black. Length of antenna: scape 1.00, pedicel 0.70, basiflagellomere 0.54, distiflagellomere 1.12. Labium black, with segmental joints paler; extending to mesocoxae. Labial segments length: I 0.54, II 0.48, III 0.54, IV 0.40. *Pronotum* black, lateral (excepting collar

area) and posterior margins orange; with abundant shorter silvery setae and scattered longer erect setae on anterior lobe. Pronotal length 1.36, width 2.08. Scutellum black, with the same setae as on pronotum. Hemelytra covered with abundant short silvery setae. Clavus black, claval commissure pale orange. Corium black, except lateral corial margins and macula on median fracture orange, and a wide whitish fringe adjacent to membrane. Membrane black, with whitish margins (Fig. 1). Legs black, except meso- and metafemora basally (Figs. 3, 4), with abundant short setae and longer semierect and erect setae. Pleurae black, except the metathoracic scent gland auricle contrastingly orange, densely covered with adpressed silvery setae. Abdomen black (Fig. 3), dorsolateral edge narrowly orange with abundant short adpressed silvery setae mixed with long erect setae. *Male genitalia*: Pygophore as Figs. 5, 6; paramere (Figs. 7,8) short with a wide shank and a large and acute blade; aedeagus (Figs. 9, 10): conjunctiva with a spinose posterior process, ductus seminis abruptly widened on distal region.

Paratypes: Similar to holotype in all aspects, except for slight differences in general coloration, e.g., some females with pale irregular markings on abdominal sternites IV and V (Fig. 4c); spermatheca rounded (Fig. 11).

Male paratypes (n= 5): Total length 6.20–6.90, mean 6.52. Head length 1.04–1.20, mean 1.14, head width 1.60–1.72, mean 1.66, interocular space 1.00–1.08, mean 1.02. Length of antenna: scape 1.00–1.06, mean 1.02, pedicel 0.76–0.84, mean 0.79, basiflagellomere 0.52–0.60, mean 0.56, distiflagellomere 1.08–1.18, mean 1.14. Labial segments length: I 0.52–0.56, mean 0.54, II 0.52–0.58, mean 0.55, III 0.54–0.60, mean 0.57, IV 0.38–0.44, mean 0.41. Pronotal length 1.40–1.48, mean 1.44, width 2.12–2.32, mean 2.23.

Female paratypes (n= 5): Total length 7.20–7.40, mean 7.28. Head length 1.16–1.20, mean 1.19, head width 1.68–1.84, mean 1.73, interocular space 1.04–1.12, mean 1.08. Length of antenna:



Figures 5-12 - *Parvacinocoris khuru*, n. sp. **5-11**. **5**. Pygophore, dorsal view; **6**. Pygophore, lateral view; **7-8**. Right paramere, **7**. Lateral view, **8**. Inner view; **9**. Aedeagus, lateral view; **10**. Aedeagus, anterior view; **11**. Spermatheca; **12**. *Acinocoris lunaris* (Gmelin), right paramere, lateral views.

scape 1.06-1.20, mean 1.11, pedicel 0.78-0.90, mean 0.82, basiflagellomere 0.58-0.64, mean 0.60, distiflagellomere 1.16-1.20, mean 1.17. Labial segments length: I 0.58-0.64, mean 0.60, II 0.60-0.70, mean 0.65, III 0.60-0.70, mean 0.65, IV 0.42-0.48, mean 0.44. Pronotal length 1.48-1.68, mean 1.55, width 2.44-2.64, mean 2.54.

Etymology. The specific epithet *khuru* is from the indigenous language Quechua, meaning bug or small animal. This language is spoken by the Quechua people, primarily living in the Andes and highlands of South America, where part of the new species was collected.

Host. Unknown.

Distribution. Argentina and Paraguay.

Type material. Holotype ♂, Argentina, Salta, 12 Km E Embarcación, antes de Pablo Lozano, 23°13.169'S 63°58.429'W, 273 m, 10-II-2016, P.M. Dellapé coll. (MLP). Paratypes: 6♂ 1♀, same data as holotype (MLP); 1♂ 2♀, Argentina, Salta, rd 53, 9 km E Padre Lozano, 275 km, 23°12.972'S 64°44.449'W, 10-II-2016, T.J. Henry coll. (NMNH); 2♀, Provincia de Salta (MACN); 1♀, Corrientes, Manantiales, II-[19]46, Birabén coll. (MLP); 1♀, Argentina, Formosa, Laguna Oca, VII-[19]39, ex Denier Colln. (MLP); 1♂ 2♀, Tucumán, Famaillá, 20-I-1921 (MACN); 1♀, Tucumán, Siambón, XII-[19]44 (IFML); 1♂, Parag.[uay], San Bernardino, 15-I-[19]39, ex Denier Colln. (MLP).

***Parvacinocoris stehliki* (Doesburg, 1966), new combination**

(Figs. 13, 14)

Acinocoris stehliki Doesburg, 1966: 4-7 [Surinam: Afobakka, border of Suriname River (type locality); Paloemeu]

Acinocoris stehliki: Schaefer, 2000: 135-136 [Venezuela: Suapure, El Caura]

Diagnosis. Antennae: underside of scape yellow and middle parts of pedicel and basiflagellomere dark brown. Labium pale brown,

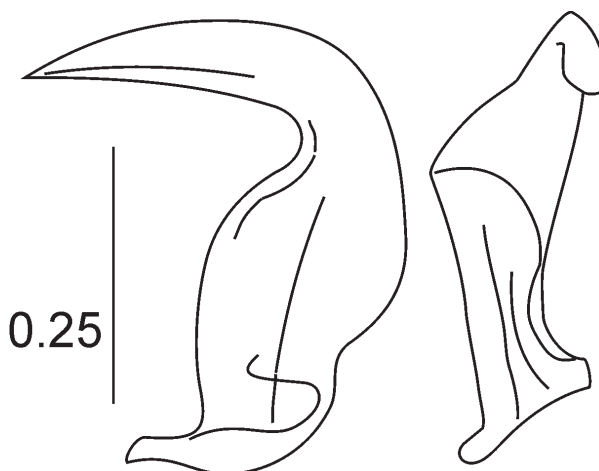


Figure 13 - *Parvacinocoris stehliki* (Doesburg, 1966), n. comb. Parameres. From Doesburg (1966).

with the last two segments darker. Hemelytra dull brown without conspicuous paler markings. Legs brown with dark areas at apex of femora, base and apex of tibiae and tarsi.

Host plants. Found on *Solanum* covered with vines (Doesburg 1966).

Distribution. Suriname, Venezuela; Brazil, Colombia and Guatemala (**new records**).

Specimens examined. 10♂ 8♀, Brazil, Amazonas, Rio Janauaca, 40 km SW Manaus, 0°20'S, 060°17'W, 10-III-1979, Montgomery, Erwin, Sucharov, Schimmel, Krischik, Date & Bacon colls., white water inundation forest canopy, fogged with pyrethrum, sample #60 (NMNH); 2♂ 2♀, Brazil, Amazonas, Paraná Costa de Ilha de Curarí (Rio Solimões), 03°25'S, 060°15'W, 3 Aug. 1979, Varzea, canopy-fogging project, TRS#01, Tray 308, Adis, Erwin, Montgomery et al. colls., white water inundation forest canopy, fogged with pyrethrum (NMNH); 1♂, Brazil, Amazon River, near Obidos, 13 Sept. 1930, Holts, Blake & Agostini colls. (NMNH); 1♀, Colombia, Pto. Carreño, Algodín, 25 Jan. 1984, Benjamin coll. (NMNH); 1♂, Guatemala, Morales, IX-1929, J.J. White, J.C. Lutz coll. (UNAM); 3♂ 3♀, same data (NMNH); 1♂, Venezuela, Guarico, 19 km NW San Fdo. de Apure, 26 July 1988, C. & L. O'Brien & G. Wibmer (NMNH).

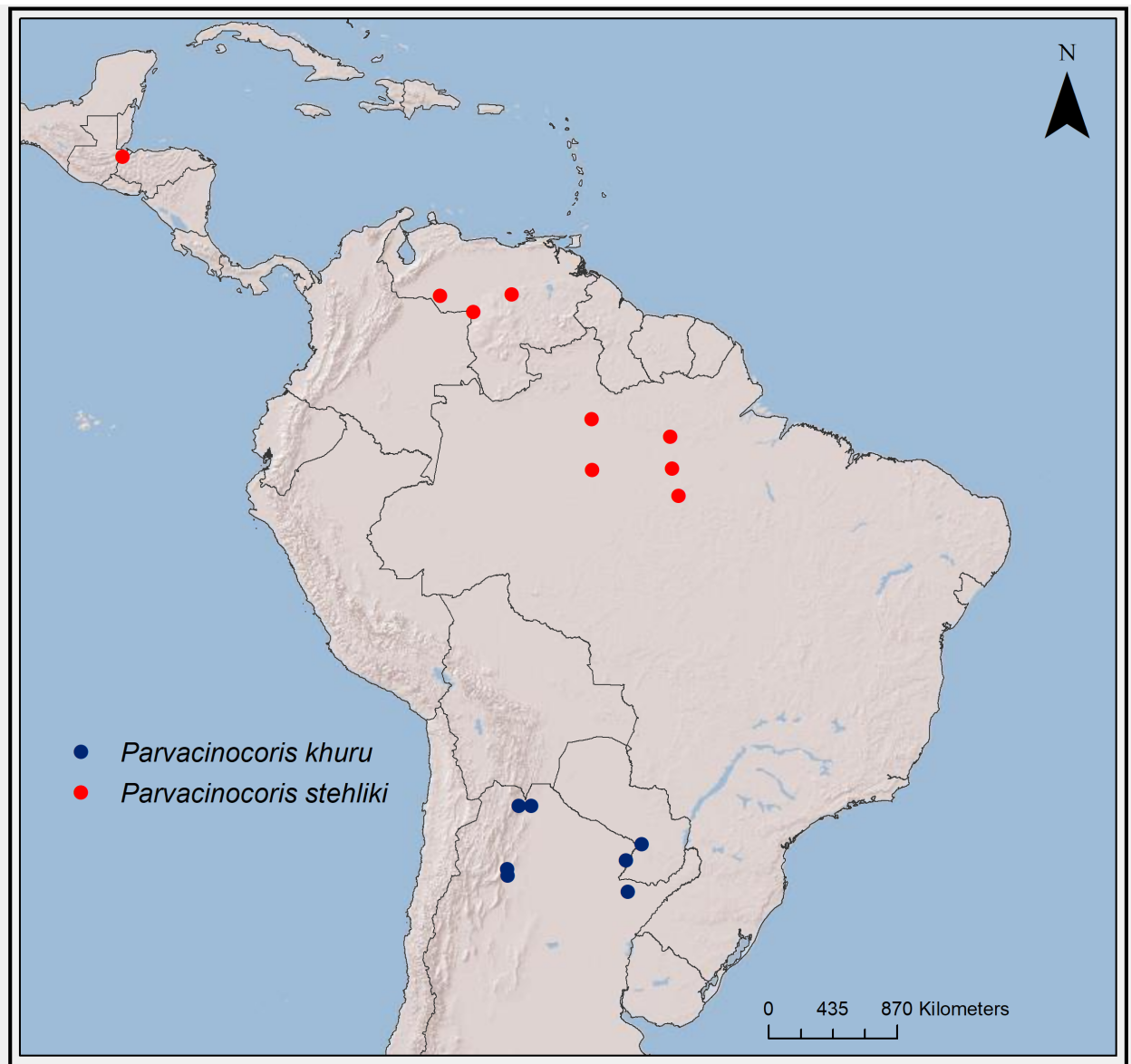


Figure 14 - Distributional map of *Parvacinocoris stehliki* (Doesburg, 1966), n. comb. and *Parvacinocoris khuru*, n. sp.

Discussion. The original description of *P. stehliki*, n. comb., agrees with all of the generic features of *Parvacinocoris* n. g. Doesburg's (1966) illustrations of the right paramere (Fig. 13) showing a wide shank and a large and acute blade, are similar to those of *P. khuru* n. sp. Both species can be separated nonetheless by the color of the antennae, labium, legs, and hemelytra. The general coloration of *P. khuru* n. sp. is darker, mostly black, except for an orange macula on median fracture and a wide whitish fringe adjacent to membrane, and the pale

base of meso- and metafemora. In *P. stehliki* n. comb. the underside of the scape is yellow and the middle parts of pedicel and basiflagellomere are dark brown, the labium and the legs are paler with brown tibiae and tarsi, and the hemelytra are paler without the conspicuous markings of *P. khuru* n. sp.

Although nothing is known about the biology of these species, because of the holotype and part of the type series of *P. khuru* n. sp. were collected on the ground, it seems to be a geophilic species.

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AUTHOR CONTRIBUTIONS

PMD and MCM designed the study, performed the descriptions and illustrations of the species, and both contributed equally to the preparation and writing of the manuscript.

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