



New species, synonymies and records in the genus *Rhagovelia* Mayr, 1865 (Hemiptera: Heteroptera: Veliidae) from Colombia

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Abstract

Rhagovelia medinae sp. nov., of the *hambletoni* group (*angustipes* complex), and *R. utria* sp. nov., of the *hirtipes* group (*robusta* complex), are described, illustrated, and compared with similar congeners. Based on the examination of type specimens, six new synonymies are proposed: *R. elegans* Uhler, 1894 = *R. pediformis* Padilla-Gil, 2010, **syn. nov.**; *R. cauca* Polhemus, 1997 = *R. azulita* Padilla-Gil, 2009, **syn. nov.**, *R. huila* Padilla-Gil, 2009, **syn. nov.**, *R. oporapa* Padilla-Gil, 2009, **syn. nov.**, *R. quilichaensis* Padilla-Gil, 2011, **syn. nov.**; and *R. gaigei*, Drake & Hussey, 1947 = *R. victoria* Padilla-Gil, 2012 **syn. nov.** The first record from Colombia is presented for *R. trailii* (White, 1879), and the distributions of the following species are extended in the country: *R. cali* Polhemus, 1997, *R. castanea* Gould, 1931, *R. cauca* Polhemus, 1997, *R. gaigei* Drake & Hussey, 1957, *R. elegans* Uhler, 1894, *R. femoralis* Champion, 1898, *R. malkini* Polhemus, 1997, *R. perija* Polhemus, 1997, *R. sinuata* Gould, 1931, *R. venezuelana* Polhemus, 1997, *R. williamsi* Gould, 1931, and *R. zeteki* Drake, 1953.

Key words: Insecta, Neotropics, Rhagoveliinae, riffle bugs, taxonomy

Introduction

Representatives of Veliidae (Hemiptera: Heteroptera: Gerromorpha) inhabit a wide variety of freshwater bodies, permanent or temporary, natural or artificial, and are considered potential indicators of biological quality of aquatic habitats (Mazzucconi *et al.* 2009). Some species live in brackish waters, coastal marine environments, or even plant-held waters (Andersen 1982). The family is the largest within Gerromorpha, with 61 genera and about 960 species worldwide (Andersen 1982, Polhemus & Polhemus 2008, Mazzucconi *et al.* 2009, Moreira *et al.* 2018). It is currently divided into six subfamilies: Haloveliinae, Microveliinae, Ocelloveliinae, Perittopinae, Rhagoveliinae, and Veliinae (Moreira 2015).

The genus *Rhagovelia* Mayr, 1865 (Rhagoveliinae) comprises a group of veliids that is very common and diverse in tropical regions (Polhemus 1997), with 14 species groups recorded from South America (Padilla-Gil & Moreira 2013). The following species groups (and their respective grade or complexes) occur in Colombia: *cali* and *torquata* (*abrupta* grade); *bisignata*, *hambletoni*, and *salina* (*angustipes* complex); *armata* (*collaris* complex); and *elegans*, *hirtipes*, and *robusta* (*robusta* complex) (Padilla-Gil & Moreira 2013, Galindo-Malagón *et al.* 2021). Additionally, two aberrant species from the country are currently ungrouped: *R. gaigei* Drake & Hussey, 1957 and *R. roldani* Polhemus, 1997 (Polhemus 1997). The status and species group of *R. candelilla* Padilla-Gil, 2012 are uncertain (see Galindo-Malagón *et al.* 2021), as well as of *R. mallama* Padilla-Gil, 2019 and *R. mirabilis* Padilla-Gil, 2019. These three were poorly described and illustrated, and were assigned to groups that are not expected to occur in Colombia.

The *abrupta* grade is a paraphyletic entity gathering groups of species where the pronotum of the apterous

forms is longer than the dorsal eye length, but shorter than three times the exposed portion of the mesonotum. All species groups within the grade also share the convex posterior margin of the apterous pronotum. Within the grade, the *cali* group is recognized by the female middle femur transversely constricted medially, or with a thinned and lighter-colored section of the integument ventrally near the middle. Additionally, the ventral abdominal sutures are simple and unmodified; the macropterous forms have four cells in the forewing, the apical two of which extend into the distal half of the wing; male antennomere III is not enlarged; and the macropterous females have paired dorsal abdominal carinae extending from mediotergite I to IV (Polhemus 1997). Currently, the *cali* group includes nine species distributed in Colombia and Ecuador (Padilla-Gil & Moreira 2013, Padilla-Gil 2019a).

In contrast to the *abrupta* grade, species groups in the *angustipes* complex have the pronotum of the apterous forms shorter than the dorsal length of the eye, with the posterior margin straight or slightly concave. Within the complex, the *salina* group is recognized by the monomorphic (apterous) species, which have dimeric tarsi and are found mainly in salt or brackish water. The two other groups in the complex include dimorphic (apterous / macropterous) species, which have trimeric tarsi and occur in freshwater. They are distinguished by the forewings with four closed cells in the *bisignata* group and three closed cells in the *hambletoni* group. The *angustipes* complex occurs along the Neotropical Region, and 26 valid species were recognized in the latest taxonomic revision for the Colombian territory (Galindo-Malagón *et al.* 2021).

In contrast to the *abrupta* grade and the *angustipes* complex, species groups in the *collaris* and *robusta* complexes have the apterous pronotum longer than three times the length of the exposed mesonotum, in most cases completely covering the latter. The two can be distinguished by the posterolateral margins of male abdominal segment VII usually bearing robust black denticles and the macropterous females with an elevated posterior pronotal projection in the *collaris* complex, whereas in the *robusta* complex the black denticles are usually absent and the elevated pronotal projection is never present (Polhemus 1997, Moreira *et al.* 2012). Within the *collaris* complex, the *armata* group is characterized by the hind tibia distinctly longer than the hind femur; the dorsal abdominal carinae in macropterous forms are parallel and distinct throughout the length of mediotergite III; and the posterolateral margins of male abdominal segment VII are always with black denticles (Polhemus 1997). This group is speciose and had 35 valid species prior to this study, ranging from Mexico to Peru (Padilla-Gil & Moreira 2013, Padilla-Gil 2019a).

Within the *robusta* complex, the *elegans*, *hirtipes*, and *robusta* groups lack black denticles on the posterolateral margins of male abdominal segment VII, in contrast to the *whitei* group, in which the denticles are present (Moreira *et al.* 2012). The *elegans* group is characterized by the sickle-shaped spur at the apex of the hind tibia (Polhemus 1997). Heretofore, it included the following four valid species: *R. elegans* Uhler, 1894, recorded from Hispaniola Island to southeastern Brazil (Drake 1948, Polhemus 1997); *R. merga* Bacon, 1956, endemic to Panama (Bacon 1956); *R. pediformis* Padilla-Gil, 2010, known only from southwestern Colombia (Padilla-Gil 2010a); and *R. uncinata* Champion, 1898, distributed from Nicaragua to northern Brazil (Polhemus 1997, Damgaard 2008, Moreira 2021).

In both the *hirtipes* and *robusta* groups, the apical spur of the hind tibia is straight whenever present. The two can be distinguished by a median carina dorsally on the abdomen of apterous females in the former, which is absent in the latter (Polhemus 1997). The *hirtipes* group contains 12 species ranging from Mexico to Brazil, while the *robusta* group contains 37 species distributed throughout the Neotropics, although more concentrated in South America (Padilla-Gil & Moreira 2013, Moreira & Barbosa 2014, Floriano & Moreira 2015, Magalhães *et al.* 2016, 2019; Padilla-Gil 2019a).

Taxonomic studies concerning the genus *Rhagovelia* have been carried out in Colombia, such as those of Polhemus & Manzano (1992), Manzano *et al.* (1995), Polhemus (1997), Padilla-Gil (2009a, b, 2010a, b, 2011a, b, c, 2012, 2015a, b, 2019a, b), Molano *et al.* (2018), and Galindo-Malagón *et al.* (2021). However, despite these efforts, there are information gaps and identification errors in the literature, which have led to the description of several synonyms, among other issues (see Galindo-Malagón *et al.* 2021 for a discussion focusing on the *angustipes* complex).

We present herein the description of two new species, *R. medinae* **sp. nov.**, of the *hambletoni* group (*angustipes* complex), and *R. utria* **sp. nov.**, of the *hirtipes* group (*robusta* complex). Furthermore, based on the examination of type material, we propose five new synonymies for species of the *armata* and *elegans* groups, and one for an incertae sedis species. Finally, the first record from Colombia is presented for *R. trailii* (White, 1879), and the distributions of the following species are extended in the country: *R. cali* Polhemus, 1997, *R. castanea* Gould, 1931, *R. cauca* Polhemus, 1997, *R. gagei* Drake & Hussey, 1957, *R. elegans* Uhler, 1894, *R. femoralis* Champion, 1898,

R. malkini Polhemus, 1997, *R. perija* Polhemus, 1997, *R. sinuata* Gould, 1931, *R. venezuelana* Polhemus, 1997, *R. williamsi* Gould, 1931, and *R. zeteki* Drake, 1953.

Material and methods

Material examined for this study are deposited in the following institutions: Colección de Insectos, Museo de Historia Natural “Luis Gonzalo Andrade”, Universidad Pedagógica y Tecnológica de Colombia, Tunja, Colombia (UPTC); Colección de Entomología, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia (ICN); Colección de Insectos, Universidad del Quindío, Armenia, Colombia (CIUQ); Colecciones Biológicas LimnoBase and Biotamar, Universidad de Antioquia, Medellín, Colombia (CLUA035 / CEMUA230); Colección Entomológica, Programa de Biología, Universidad de Caldas, Manizales, Colombia (CEBUC); and National Museum of Natural History, Smithsonian Institution, Washington D.C., USA (NMNH). In the UPTC, photographs of the specimens were taken using a Leica S9I stereomicroscope with integrated camera. In the NMNH, series of photographs were taken using a Cannon EOS 5D and combined into multi-focal images using the Visionary Digital software. All measurements are given in millimetres. Distribution maps were prepared using QGIS 2.18 (QGIS Development Team, 2020). When geographic coordinates were not available on specimen labels, these were assigned by searching for the localities in online gazetteers and using Google Earth Pro.

Results and Discussion

Rhagovelia abrupta grade

Rhagovelia cali group

Rhagovelia cali Polhemus, 1997

(Fig. 6A, 13A)

Rhagovelia cali Polhemus, 1997: 65–68.

Diagnosis. Body length: apterous male (~3.9), apterous female (~4.1), macropterous male (~4.3), macropterous female (~4.7). General color uniformly blackish-grey. Median length of apterous pronotum shorter than three times median length of exposed mesonotum, but longer than dorsal eye length. Posterior margin of pronotum convex. Ventral abdominal sutures simple and unmodified. Male antennomere III not enlarged. Male hind tibia straight, with eight small spines on basal half of posterior margin. Male paramere and proctiger as in Polhemus (1997: 77, figs. 57, 60). Female middle femur with a transverse constriction medially. Posterolateral angles of female abdominal laterotergite VII folded mesally and meeting over basal portion of tergum VIII, with small tufts of black setae. Female abdominal tergum VIII angled downward at 45°.

Distribution. COLOMBIA: **Antioquia** (Polhemus 1997; this work), **Nariño** (Padilla-Gil 2016, 2019a, 2020), **Quindío** (Morales-Castaño & Molano-Rendón 2008, this work), **Risaralda** (this work), **Valle del Cauca** (Polhemus 1997) (Fig. 6A). ECUADOR (Buzzetti and Cianferoni 2011).

Material examined. **Antioquia:** Frontino, Quebrada Murindo, vía Dabeiba-Uramita, 784 m, 6°53'20.1" N, 76°14'40.8" W, 13.VIII.2016, (F. Molano): 1 ♀ apterous (UPTC-In-05561). Santa Fe de Antioquia, Quebrada Los Perros, Vía Santa Fe de Antioquia-Cañasgordas, 1769 m, 6°37'20.5" N, 75°52'28.8" W, 13.VIII.2016, (F. Molano): 7 ♂ apterous, 2 ♀ apterous (UPTC-In-05562). Sonsón, Cerro Las Cruces, 3000 m, 06.I.2010, (L. Ríos): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05941). **Quindío:** Calarcá, Vereda San Rafael, quebrada La Virgen, 1994 m, 13.VII.2005, (Proyecto 249): 13 ♂ apterous, 1 ♀ apterous (UPTC-In-05760). Calarcá, Vereda San Rafael, quebrada La Virgen, 1994 m, 13.VII.2005, (J. Cobos): 1 ♂ macropterous, 9 ♂ apterous, 3 ♀ apterous (UPTC-In-05762). Filandia, Bremen, 1868 m, 08.VII.2005, (H. Suárez): 3 ♂ apterous, 1 ♀ apterous (UPTC-In-05764). **Risaralda:** Pueblo Rico, Vereda Montebello, inmediaciones del Parque Nacional Natural Tatamá, Reserva Natural Montezuma, cuenca Río Taiba, 1300 m, 01.XI.2014, (M.I. Castro): 4 ♂ apterous, 2 ♀ apterous (UPTC-In-05560). Pueblo Rico,

Vereda Montebello, estación 3, Río Claro, 1300 m, 17.IV.2014, (D. Díaz & J. Arévalo): 1 ♂ apterous (UPTC-In-05949). Pueblo Rico, Vereda Montebello, finca Montezuma, 17.IV.2014, (D. Díaz & J. Arévalo): 1 ♀ macropterous (UPTC-In-05950).

Rhagovelia angustipes complex

Rhagovelia hambletoni group

Rhagovelia medinae sp. nov.

(Table 1, Fig. 1, 3A, C, 5A, B)

Apterous male. *Color and pilosity.* Body brown to black, covered by short, shiny, golden setae. Head with erect, black setae on frons. Base of antennomere I pale-yellow; rest of antenna brown to dark-brown. Antennomere I with six robust, erect, black setae; II with a pair of robust, erect, black setae. Eye dark-red. Buccula yellowish-brown. Labium yellowish-brown, with apex dark-brown. Pronotum with long, black setae on sides; anterior lobe with central trapezoidal yellowish mark sided by brownish pubescence; posterior lobe covered by dark-brown setae. Sides and venter of thorax greyish-black; intersegmental areas between pro- and mesosterna, and meso- and metasterna with a short, transverse, black stripe each. Thoracic and abdominal sterna covered by light setae. Acetabula and coxae yellowish. Fore and hind trochanters yellow; middle trochanter brown to black; basal half of fore femur yellowish; apex of fore femur, middle and hind femora, tibiae and tarsi dark-brown. Abdominal mediotergites I–VI and mesal portion of laterotergites black, covered by brown pubescence; lateral portion of laterotergites shiny brown; abdominal mediotergite VII and tergum VIII centrally with shiny black areas. Abdominal sterna black, covered by greyish pubescence; VII mostly yellowish-brown; segment VIII covered by long brown setae. Legs covered by short brown setae; lighter-colored, thinner, long setae on coxae and trochanters; rows of long, robust, black setae on femora and tibiae. Terminalia dorsally black, ventrally brown. *Structure.* Head relatively short and wide; midline and two oblique basal foveae impressed and shining. Antennomere I thicker than others, slightly wider on apex, curved laterally; II and III cylindrical, III not enlarged; IV fusiform. Labium wide, reaching middle of mesosternum. Pronotum longer than dorsal eye length, partially covering mesonotum, with lateral margins diverging posteriorly and posterior margin slightly convex; posterior region with a straight, transverse sulcus, giving the impression of a double posterior margin (Fig. 1E). Exposed portion of mesonotum with about 1.4 times median length of pronotum, covered by short brown setae, posterior margin straight centrally. Metanotum short and wide; posterior margin straight centrally. Fore tibia with grasping comb extending slightly beyond apex. Hind trochanter without pegs. Hind femur incrassate, surpassing apex of abdomen; apical half with two rows of spines – dorsal row with 11–12 spines decreasing in size distally; ventral row with eight subequal spines. Hind tibia straight, with obtuse spinules throughout posterior surface plus a straight apical spur. Abdominal mediotergites I–VI subrectangular; VII slightly longer than wide; dorsum of abdominal segment VIII longer than mediotergite VII. Abdominal laterotergites slightly elevated. Ventral abdominal sutures simple and unmodified. Abdominal sternum VII anteriorly with a pair of projections bearing tufts of brown setae (Fig. 1F); posterolateral margins surrounding genital cavity without black denticles. Abdominal segment VIII cylindrical, with weak carina ventrally. Proctiger as in Fig. 3A. Parameres symmetrical, longer than wide, wider between base and middle (Fig. 3C).

Apterous female. Color and pilosity similar to apterous male. Posterior margin of pronotum less convex than on male. Hind femur with two rows of spines – dorsal row with eight black spines decreasing in size distally, ventral row with five subequal spines. Hind tibia straight, with obtuse spinules throughout posterior surface plus a straight apical spur. Dorsum of abdominal segments VI–VIII centrally shiny-black. Abdominal laterotergites sinuous, slightly elevated, more strongly on segments VI–VII; lateral margins with abundant brown setae; posterolateral angles of segment VII sinuous and parallel. Abdominal tergum VIII rounded.

Macropterous male. Similar to apterous male in general color, pilosity, and structure. Pronotum long, brown, with a yellow spot behind vertex; posterior margin rounded. Forewing surpassing apex of abdomen, with 2 long, proximal, closed cells and 1 short, apical, closed cell; all cells contained within basal half of wing; veins brown (Fig. 1G). Abdominal laterotergites I–III visible dorsally.

Macropterous female. Similar to macropterous male in general color, pilosity, and structure.

TABLE 1. Measurements (in mm) of males and females of *Rhagovelia medinae* sp. nov. and *R. utria* sp. nov.

Character	<i>R. medinae</i> sp. nov.				<i>R. utria</i> sp. nov.			
	Apterous ♂	Macropterous ♂	Apterous ♀	Macropterous ♀	Apterous ♂	Macropterous ♂	Apterous ♀	Macropterous ♀
BL	3.14	3.01	3.50	3.48	3.71	4.05	3.85	3.88
HL	0.36	0.31	0.38	0.30	0.32	0.30	0.40	0.40
HW	0.80	0.75	0.81	0.76	0.88	0.84	0.85	0.87
HWE _{mn}	0.14	0.18	0.15	0.17	0.24	0.20	0.22	0.32
HWE _m	0.37	0.42	0.41	0.41	0.47	0.45	0.49	0.47
ANTI	1.00	0.85	0.92	0.84	0.91	0.91	1.06	0.88
ANTII	0.57	0.55	0.50	0.47	0.53	0.49	0.50	0.46
ANT III	0.64	0.55	0.54	0.46	0.51	0.54	0.55	0.49
ANTIV	0.56	0.51	0.53	0.48	0.53	0.57	0.50	0.48
EW	0.33	0.29	0.30	0.29	0.33	0.32	0.27	0.38
PL	0.43	1.27	0.39	1.32	1.08	1.40	1.10	1.47
PW	1.13	1.36	1.03	1.33	1.12	1.41	1.23	1.57
MSL	0.59	-	0.64	-	-	-	-	-
MTL	0.12	-	0.12	-	0.12	-	0.07	-
FF	1.06	1.01	0.96	0.95	1.04	1.02	1.08	1.14
FT	1.09	1.04	1.09	1.03	1.09	1.12	1.07	1.16

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TABLE 1. (Continued)

Character	<i>R. medinae</i> sp. nov.				<i>R. utria</i> sp. nov.			
	Apterous ♂	Macropterous ♂	Apterous ♀	Macropterous ♀	Apterous ♂	Macropterous ♂	Apterous ♀	Macropterous ♀
FThI	0.05	0.04	0.04	0.03	0.07	1.63	0.05	0.03
FThII	0.03	0.02	0.02	0.02	0.06	1.23	0.04	0.04
FThIII	0.30	0.27	0.29	0.28	0.38	1.10	0.33	0.32
MF	1.91	1.88	1.69	1.72	1.75	0.54	1.73	1.66
MT	1.50	1.41	1.36	1.32	1.20	0.71	1.30	1.26
MThI	0.08	0.06	0.10	0.06	1.10	0.10	0.08	0.10
MThII	0.75	0.71	0.65	0.64	0.63	0.52	0.60	0.58
MThIII	0.76	0.69	0.71	0.72	0.81	0.73	0.83	0.79
HF	1.71	1.57	1.39	1.34	1.51	1.60	1.28	1.36
HT	1.57	1.39	1.40	1.42	1.41	1.43	1.57	1.53
HTrI	0.07	0.07	0.05	0.06	0.07	0.08	0.07	0.08
HTrII	0.14	0.06	0.13	0.08	0.13	0.17	0.18	0.20
HTrIII	0.30	0.32	0.32	0.36	0.42	0.36	0.37	0.36

BL= body length, HL= head length, HW= head width, HWE= minimum width between eyes, HWE= maximum width between eyes, ANT I-IV= length of antennomeres I-IV, EW= eye width, PL= pronotum length at midline, PW= pronotum width, MSL= mesonotum length at midline, MTL= mesonotum length at midline, FF= fore femur length, FT= fore tibia length, FTr I-III= length of fore tarsomeres I-III, MF= middle femur length, MT= middle tibia length, MTr I-III= length of middle tarsomeres I-III, HF= hind femur length, HT= hind tibia length, HTr I-III= length of hind tarsomeres I-III, TG I-VIII= length of abdominal mediotergites I-VIII.

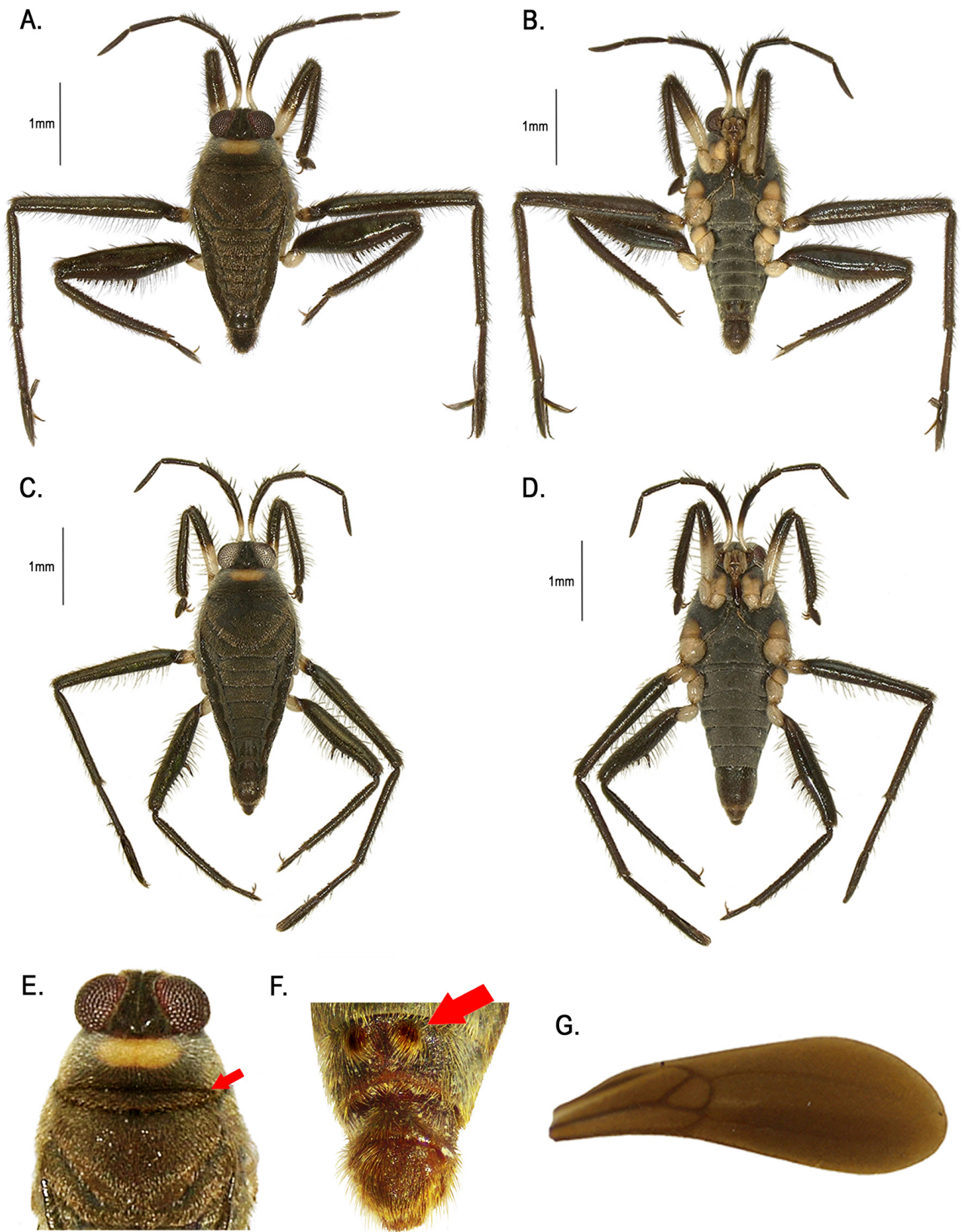


FIGURE 1. *Rhagovelia medinae* sp. nov.: **A.** Male, dorsal view (holotype); **B.** Male, ventral view (holotype); **C.** Female, dorsal view (paratype); **D.** Female, ventral view (paratype); **E.** Head and thorax, male, dorsal view, arrow indicates sulcus adjacent to posterior margin of pronotum (holotype); **F.** Apex of abdomen, male, ventral view, arrow indicates tubercles on sternum VII (holotype). **G.** Forewing, male (paratype).

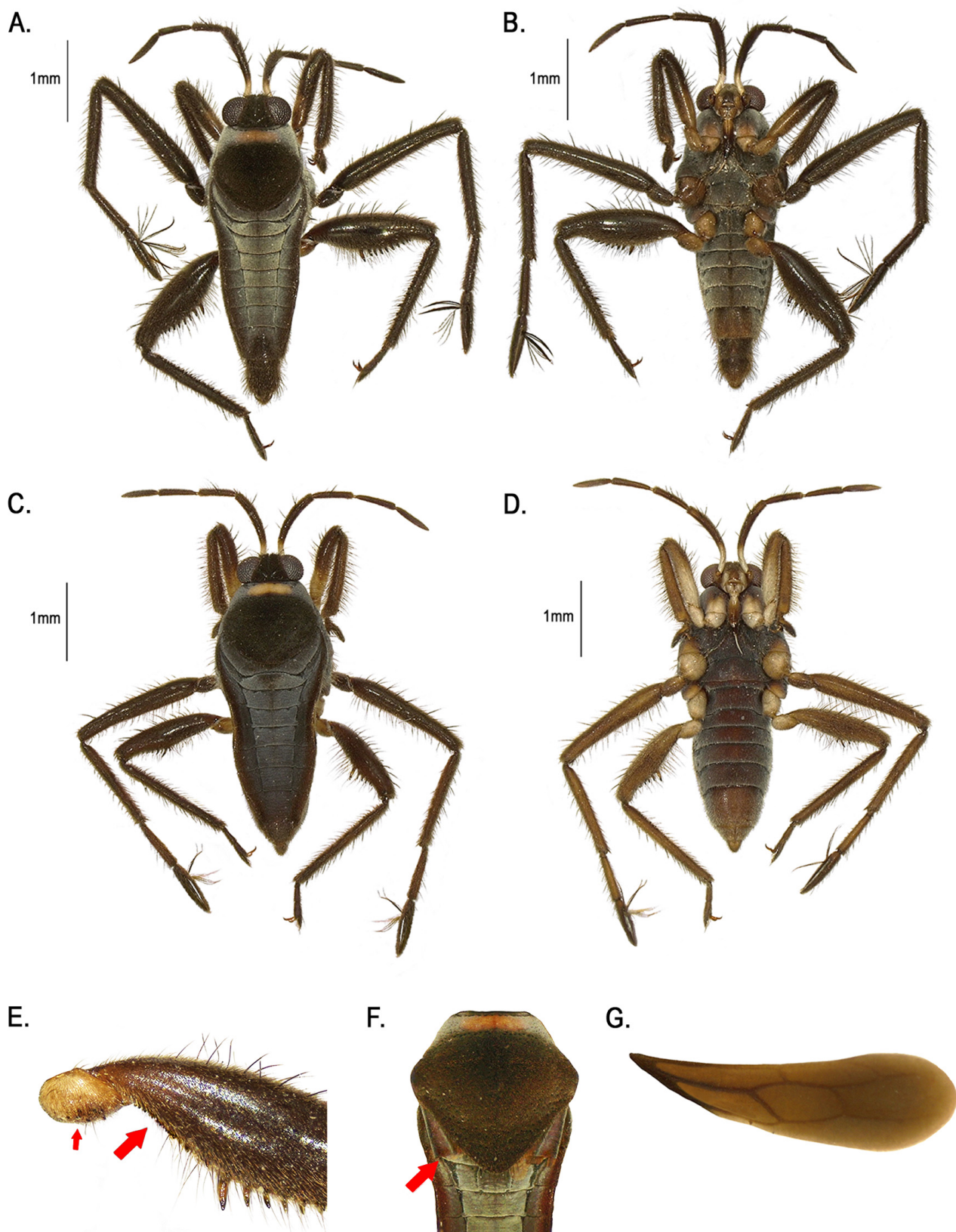


FIGURE 2. *Rhagovelia utria* sp. nov.: **A.** Male, dorsal view (holotype); **B.** Male, ventral view (holotype); **C.** Female, dorsal view (paratype); **D.** Female, ventral view (paratype); **E.** Hind trochanter and base of hind femur, male, arrows indicates small spines on trochanter and base of femur (holotype); **F.** Thorax and base of abdomen, macropterous female, arrow indicates mutilated wing (paratype). **G.** Forewing, male (paratype).

Comments. The apterous pronotum in *R. medinae* **sp. nov.** is unique among Neotropical *Rhagovelia*, being longer than the dorsal eye length, partially covering the mesonotum, with the lateral margins diverging posteriorly and the posterior margin slightly convex, also bearing a straight, transverse sulcus on the posterior region, giving the impression of a double posterior margin (Fig. 1E). However, the assignment to the *hambletoni* group can be made based on the forewing bearing only three closed cells, all of which are contained within the proximal half of the wing (Fig. 1G). It differs from all other species of the group, as well as from the rest of the *angustipes* complex, by the pair of projections bearing tufts of brown setae located anteriorly on male abdominal sternum VII (Fig. 1F). This new species is superficially similar to *R. barbacoensis* Padilla-Gil, 2015 in the yellow coloration of all coxae and fore and hind trochanters, the middle trochanter brown to black, and male abdominal mediotergite VII and tergum VIII centrally with a shiny black area each. However, the two can be readily distinguished because *R. medinae* **sp. nov.** has two rows of spines in the apical half of the hind femur, while *R. barbacoensis* has a single row. Additionally, this new species can be diagnosed by the combination of: body length, apterous male (~3.15) / apterous female (~3.50) / macropterous male (~3.50) / macropterous female (~3.50); general color brown to black; male hind tibia with obtuse spinules throughout posterior surface plus a straight apical spur; male paramere as in Fig. 3C; posterolateral angles of female abdominal laterotergite VII sinuous and parallel; and female abdominal tergum VIII rounded.

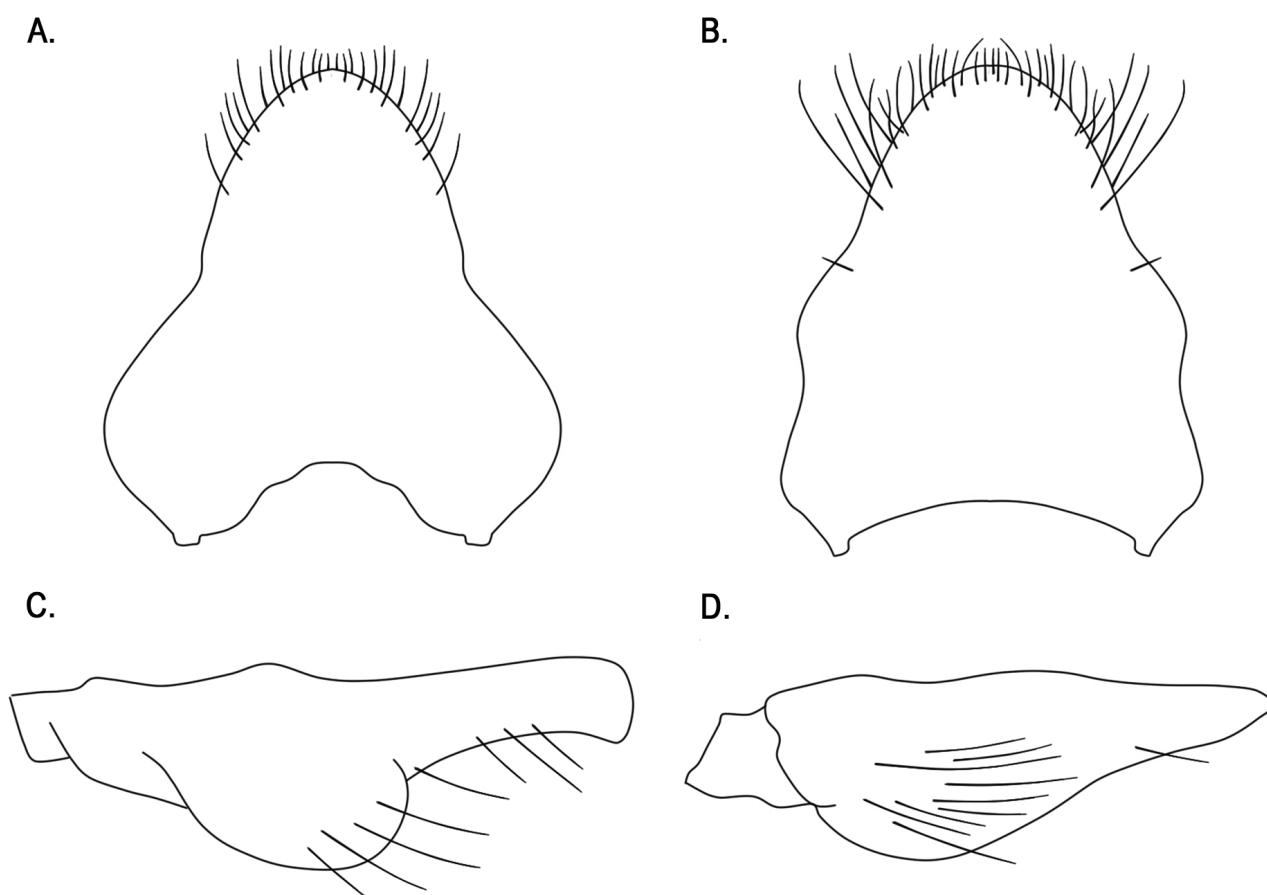


FIGURE 3. **A.** Male proctiger, *Rhagovelia medinae* **sp. nov.** (paratype); **B.** Male proctiger, *R. utria* **sp. nov.** (paratype); **C.** Paramere, *R. medinae* **sp. nov.** (paratype); **D.** Paramere, *R. utria* **sp. nov.** (paratype).

Etymology. This species is named in honor of Dr. Claudia Medina (Instituto Alexander von Humboldt, Villa de Leyva, Colombia), who has made innumerable contributions to the field of entomology in Colombia and has mentored many women in science.

Distribution. COLOMBIA: **Caquetá** (this work) (Fig. 5A).

Type material examined. Holotype apterous ♂ (UPTC-In-10860): ‘Colombia \ Caquetá \ El Paujil \ Vereda La Cristalina \ 665 m \ 1°34.699’ N, 75°22.300” W \ 25.XI.2017 \ Col: L. Flórez & P. Sánchez’. Paratypes 6 ♂ macropterous, 8 ♂ apterous, 4 ♀ macropterous, 6 ♀ apterous (UPTC-In-05819): same data as holotype.

Rhagovelia collaris complex

Rhagovelia armata group

Rhagovelia cauca Polhemus, 1997

(Fig. 4A, B, 6B)

Rhagovelia cauca Polhemus, 1997: 222–225.

Rhagovelia azulita Padilla-Gil, 2009a: 203. **Syn. nov.**

Rhagovelia huila Padilla-Gil, 2009a: 200. **Syn. nov.**

Rhagovelia oporapa Padilla-Gil, 2009a: 206. **Syn. nov.**

Rhagovelia quilichaensis Padilla-Gil, 2011a: 33. **Syn. nov.**

Comments. The structural characteristics of the apterous females of *R. azulita* are compatible with *R. cauca*, including the middle tibia strongly concave and flattened ventrally at the base (Fig. 4B), the shape of the abdominal laterotergites, and abdominal mediotergite VII with a dense fringe of long black bristles on the posterior margin (Fig. 4A). In addition, males have black denticles on the proepisternum near the labium, and the paramere examined on the type series is identical to that of *R. cauca*, differing from the illustration provided by Padilla-Gil (2009a). The only marked difference between these two species is the dark general coloration of *R. azulita* with contrasting lighter-colored areas on the anterior lobe of the pronotum and the lateral margins of the abdominal laterotergites, whereas *R. cauca* usually has a lighter and more uniform general coloration. However, as Polhemus (1997) mentioned, the populations of *R. cauca* from Ecuador tend to be much darker than those from Colombia. This probably also occurs in populations from Huila Department, in southern Colombia and close to Ecuador, where the types of *R. azulita* have been collected. Therefore, *R. azulita* is here considered a junior synonym of *R. cauca*.

The type specimens of *R. huila* are identical to those of *R. azulita* and they have been collected in the same municipality in Huila. The same comments mentioned above for *R. azulita* are valid for *R. huila*, which we also consider a junior synonym of *R. cauca*, differing from other Colombian populations only by the darker coloration. The original description of *R. huila* presents several inconsistencies in relation to the type specimens; for example, the male has black denticles on the proepisternum, which are lacking in the original description, and bears two rows of spines on the hind tibia, whereas only one is mentioned by Padilla-Gil (2009a). The type specimens of *R. oporapa* are also conspecific with *R. cauca*, based on the same reasons mentioned for *R. azulita* and *R. huila*. The types of *R. oporapa* are even darker than those of *R. azulita* and *R. huila*, with an almost uniformly dark coloration and very small contrasting areas on the abdominal laterotergites. Additionally, some of the paratypes of *R. oporapa* were collected at the same locality and on the same date as those of *R. huila*.

The type material of *R. quilichaensis* has all typical characteristics of *R. cauca*, including the orange general coloration with yellow areas on the pronotum and the abdominal laterotergites that do not contrast strongly with the rest of the body. The shape of the paramere is as illustrated by Polhemus (1997) for *R. cauca*, and not the complex figure drawn by Padilla-Gil (2011a: 35, fig. 2). Consequently, we also consider *R. quilichaensis* a junior synonym of *R. cauca*. Finally, we present a table comparing the measurements presented in the original descriptions of the species herein synonymized and the values that we obtained from the type specimens examined, showing that they differ considerably (Table 2).

Distribution. COLOMBIA: **Antioquia** (Polhemus 1997), **Cauca** (Padilla-Gil 2011a, 2019a, 2020), **Huila** (Padilla-Gil 2009, Aristizábal-García 2017), **Quindío** (Morales-Castaño & Molano-Rendón 2008, this work), **Risaralda** (this work), **Santander** (this work), **Tolima** (Parra-Trujillo *et al.* 2014), **Valle del Cauca** (Polhemus 1997, this work) (Fig. 6B). ECUADOR (Polhemus 1997).

Type material examined. Holotype apterous ♂ of *R. cauca* (NMNH): ‘Colombia, Valle del Cauca, swift forest stream 4 km. E of Peñas Blancas, 1550 m, 26-VII-1989, CL2420. D.A & J.T. Polhemus’. Holotype apterous ♂, allotype apterous ♀ of *R. azulita* (ICN): ‘Colombia, Huila, Oporapa, Vereda San Ciro, Quebrada Azulita, IV.2001. W. Bonilla leg’. Paratypes 4 ♂ apterous, 5 ♀ apterous of *R. azulita* (ICN): same data as holotype. Holotype apterous ♂, allotype apterous ♀ of *R. huila* (ICN): ‘Colombia, Huila, Oporapa, Vereda San Ciro, 1375 m. 14.II.2001. W. Bonilla leg’. Paratypes 8 ♂ apterous, 1 ♂ macropterous, 5 ♀ apterous of *R. huila* (ICN): same data as holotype. Holotype apterous ♂, allotype apterous ♀ of *R. oporapa* (ICN): ‘Colombia, Huila, Oporapa, Quebrada Caparrosa, Charco El Chunche. 07.II.2001. Bonilla leg’. Paratypes 3 ♂ apterous, 3 ♀ apterous of *R. oporapa* (ICN): ‘Colombia,

Huila, Oporapa, Vereda San Ciro. 1375 m. 14.II.2001. W. Bonilla leg'. Holotype apterous ♂, allotype apterous ♀ of *R. quilichaensis* (ICN): 'Colombia, Cauca, Santander de Quilichao, Corregimiento San Pedro. 02.IV.2010. D.N. Padilla leg'. Paratypes 1 ♂ apterous, 1 ♂ macropterous, 1 ♀ apterous, 1 ♀ macropterous of *R. quilichaensis* (ICN): same data as holotype.

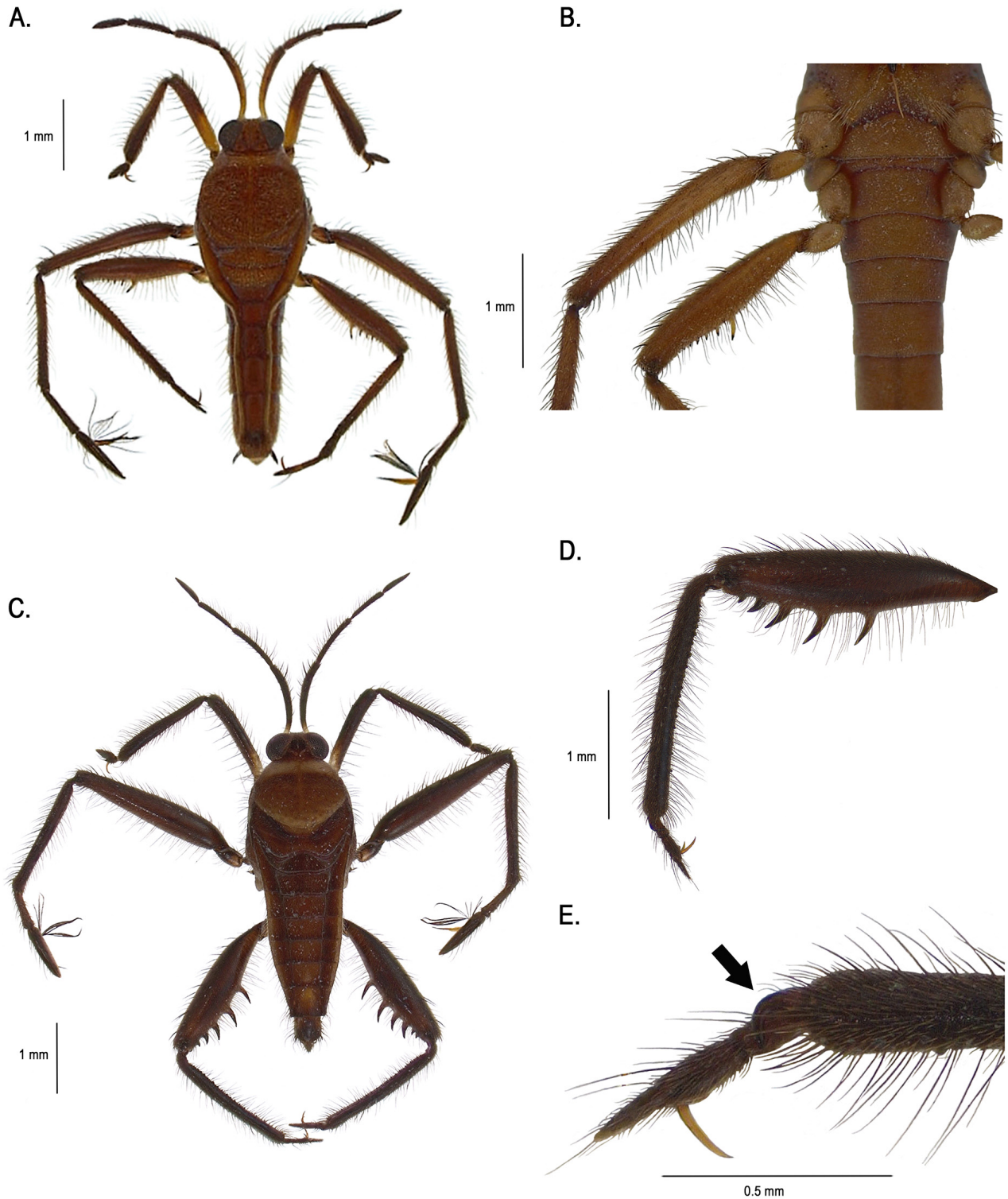


FIGURE 4. A. Female, dorsal view, *Rhagovelia cauca*; B. Female, ventral view, *R. cauca*; C. Male, dorsal view, *R. elegans*; D. Hind femur, tibia, and tarsus, male, ventral view, *R. elegans*; E. Apex of hind tibia and tarsus, male, ventral view, *R. elegans*, arrow indicates crescent-shaped spur.

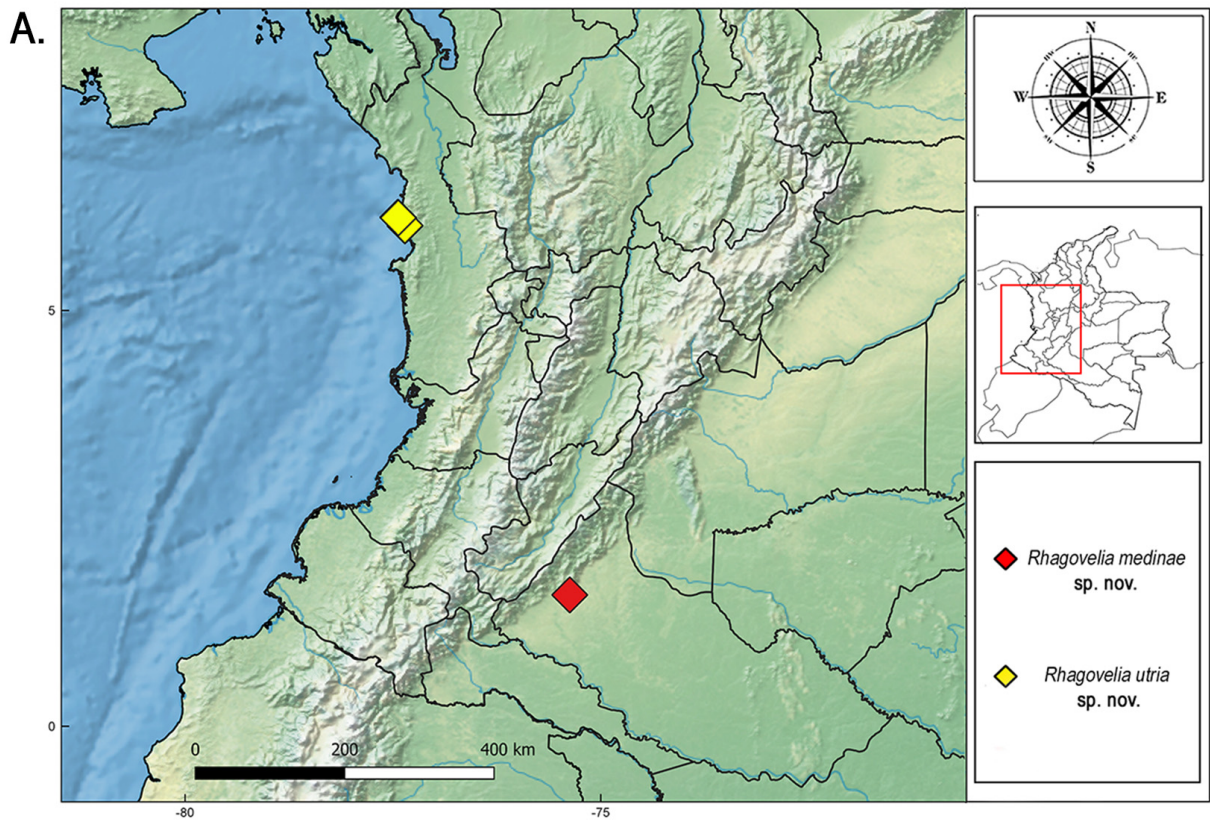


FIGURE 5. A. Geographic distribution of *Rhagovelia medinae* sp. nov. and *R. utria* sp. nov.; B. Type locality of *R. utria* sp. nov.

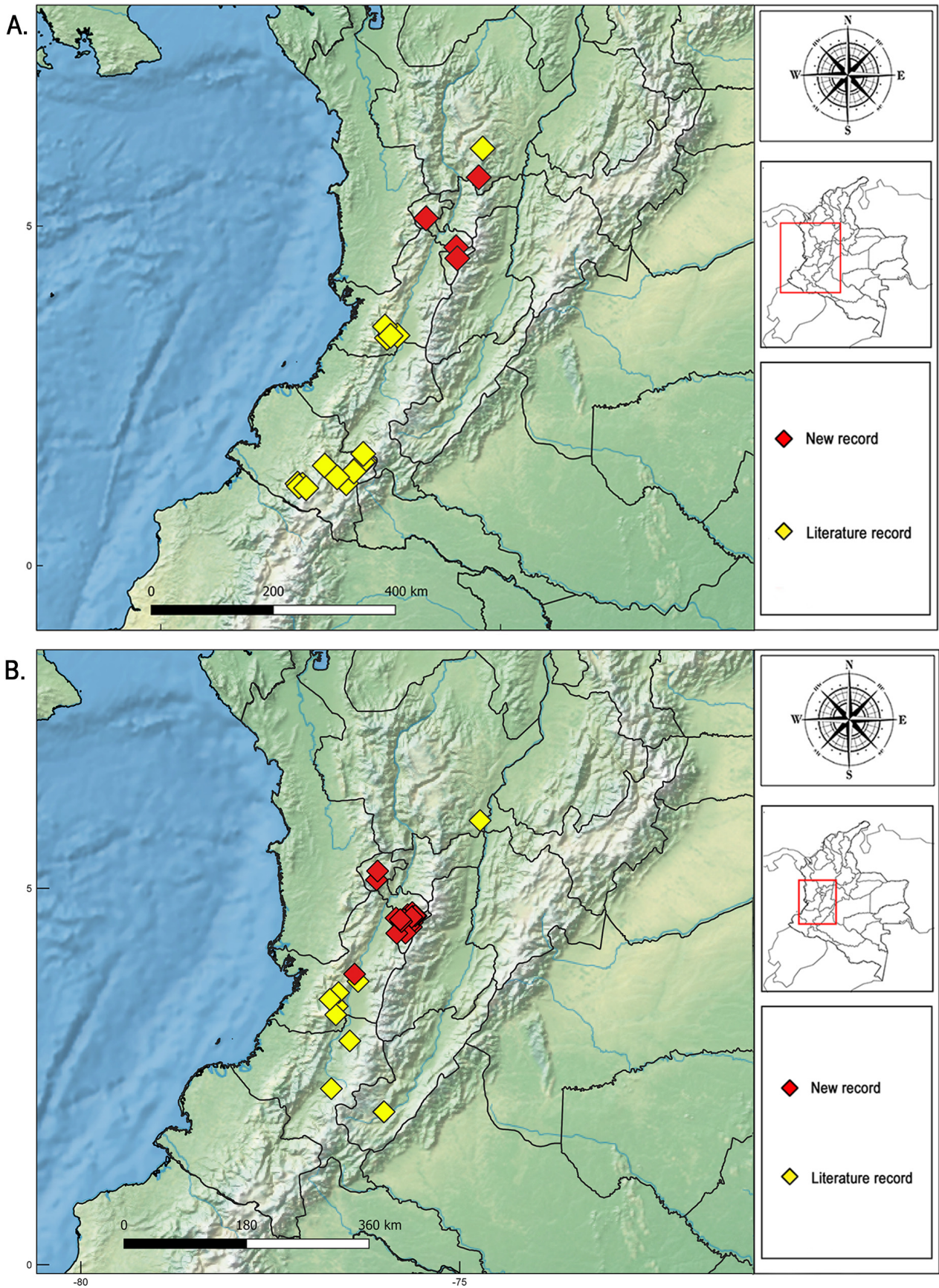


FIGURE 6. Geographic distributions in Colombia of **A.** *Rhagovelia cali*; **B.** *Rhagovelia cauca*.

Additional material examined. Quindío: Armenia, Vereda Ríobamba, Río Espejo, 1546 m, 23.X.2005, (M. Rojas): 6 ♂ apterous, 5 ♀ apterous (CIUQ). Armenia, Vereda Ríobamba, Río Espejo, 1546 m, 07.XI.2005, (A. Londoño): 4 ♂ apterous, 3 ♀ apterous (CIUQ). Armenia, Sendero C. Rosado, 1450 m, 07.XI.2005, (A. Londoño): 2 ♂ apterous, 1 ♀ apterous (CIUQ). Armenia, Uniquindio, 1450 m, 21.XI.2003, (C. Cuartas): 1 ♂ apterous, 1 ♀ apterous (CIUQ). Barcelona, 1003 m, 10.VII.2005, (F. Molano): 2 ♂ apterous, 2 ♀ apterous (UPTC-In-05823). Calarcá, Vereda Pradera Baja, quebrada El Pescadorcito, 1609 m, 13.VII.2005, (Proyecto 249): 2 ♂ macropterous, 6 ♂ apterous, 2 ♀ macropterous, 5 ♀ apterous (UPTC-In-05814). Calarcá, La Virginia, quebrada El Cofre, 1727 m, 13.VII.2005, (Proyecto 249): 3 ♂ apterous, 4 ♀ apterous (UPTC-In-05827). Calarcá, La Virginia, quebrada La Honda, 1741 m, 13.VII.2005, (F. Molano): 8 ♂ apterous, 2 ♀ macropterous, 2 ♀ apterous (UPTC-In-05829). Calarcá, La Bella, 1277 m, 10.VII.2005, (D. Pana): 4 ♂ apterous (UPTC-In-05830). Calarcá, La Virginia, quebrada Platanillas, 1772 m, 13.VII.2005, (Proyecto 249): 7 ♂ apterous, 4 ♀ apterous (UPTC-In-05840). Calarcá, La Virginia, 1420 m, 13.VII.2005, (I. Morales): 9 ♂ apterous, 12 ♀ apterous (UPTC-In-05841). Calarcá, Vereda Pradera, E67, 13.VII.2005, (I. Morales): 1 ♂ apterous, 4 ♀ apterous (UPTC-In-05842). Calarcá, Vereda Pradera, 1600 m, 13.VII.2005, (J. Cobos): 1 ♂ apterous, 3 ♀ apterous (UPTC-In-05843). Circasia, Abedules, 1689 m, 16.VII.2005, (I. Morales): 6 ♂ macropterous, 3 ♂ apterous, 4 ♀ macropterous, 10 ♀ apterous (UPTC-In-05815). Circasia, El Silencio, 1500 m, 16.VII.2005, (J. Cobos): 3 ♂ macropterous, 2 ♂ apterous, 3 ♀ macropterous, 1 ♀ apterous (UPTC-In-05816). Circasia, Pinares, 1449 m, 16.VII.2005, (D. Parra): 4 ♂ apterous, 6 ♀ apterous (UPTC-In-05821). Circasia, Vereda Membrillal, Quebrada La Arenosa, 1534 m, 16.VII.2005, (Proyecto 249): 2 ♂ apterous, 4 ♀ apterous (UPTC-In-05824). Circasia, Pinares, 1499 m, 16.VII.2005, (J. Cobos): 3 ♂ apterous, 1 ♀ apterous (UPTC-In-05825). Circasia, Los Pinos, 1566 m, 16.VII.2005, (C. Rivera): 7 ♂ apterous, 9 ♀ apterous (UPTC-In-05836). Filandia, Bambuco, 1800 m, S.F., (H. Suárez): 3 ♂ apterous (UPTC-In-05540). Filandia, Bremen, 1686 m, 08.VII.2005, (F. Molano): 3 ♂ macropterous, 6 ♂ apterous, 2 ♀ macropterous, 3 ♀ apterous (UPTC-In-05770). Filandia, Bremen, 1686 m, 08.VII.2005, (H. Suárez): 1 ♂ macropterous, 36 ♂ apterous, 13 ♀ apterous (UPTC-In-05813). Filandia, Bremen, E. Los Monos, 1686 m, 08.VII.2005, (F. Molano): 1 ♂ macropterous, 1 ♂ apterous, 1 ♀ macropterous, 5 ♀ apterous (UPTC-In-05833). Filandia, Bambuco Alto, 1800 m, 08.VII.2005, (H. Suárez): 5 ♂ apterous, 4 ♀ apterous (UPTC-In-05839). La Tebaida, Quebrada 7, 1800 m, 10.IV.2005, (F. Molano): 2 ♂ macropterous, 10 ♂ apterous, 10 ♀ apterous (UPTC-In-05838). Montenegro, Quebrada 1, 09.IV.2005, (F. Molano): 1 ♂ apterous, 2 ♀ apterous (UPTC-In-05536). Montenegro, Quebrada 4, 1229 m, 09.IV.2005, (F. Molano): 6 ♂ apterous, 5 ♀ apterous (UPTC-In-05539). Montenegro, Vereda Orinoco, quebrada El Cenizo, 1226 m, 12.VII.2005, (F. Molano): 2 ♂ apterous, 4 ♀ apterous (UPTC-In-05768). Montenegro, Vereda Guatemala, 1200 m, 12.VII.2005, (I. Morales): 2 ♂ apterous, 1 ♀ apterous (UPTC-In-05771). Montenegro, Vereda La Pradera, Quebrada El Pescador, E62, 13.VII.2005, (I. Morales): 2 ♂ apterous, 1 ♀ apterous (UPTC-In-05844). Quimbaya, Tigrera, 1100 m, 09.VII.2005, (L. García): 19 ♂ apterous, 18 ♀ apterous (UPTC-In-05826). Vereda El Laurel, Reserva Natural La Montaña del Ocaso, 987 m, 24.IV.2018, (D. Martínez): 1 ♂ apterous (UPTC-In-05946). Salento, La Nubia, 1430 m, 16.VII.2005, (J. Cobos): 3 ♂ macropterous, 2 ♂ apterous, 1 ♀ macropterous, 1 ♀ apterous (UPTC-In-05769). Salento, La Playa, 1718 m, 07.VII.2005, (J. Cobos): 2 ♂ macropterous, 9 ♂ apterous, 1 ♀ macropterous, 10 ♀ apterous (UPTC-In-05828). Salento, Boquía, 1682 m, 07.VII.2005, (J. Cobos): 1 ♂ macropterous, 6 ♂ apterous, 12 ♀ apterous (UPTC-In-05831). Salento, Boquía, 1600 m, 07.VII.2005, (I. Morales): 2 ♂ macropterous, 1 ♂ apterous, 1 ♀ macropterous, 5 ♀ apterous (UPTC-In-05837). **Risaralda:** Pueblo Rico, Vereda Montebello, inmediaciones Parque Nacional Natural Tatamá, Reserva Natural Montezuma, cuenca Río Taiba, 1300 m, 01.XI.2014, (M.I. Castro): 7 ♂ apterous, 4 ♀ apterous (UPTC-In-05538). Pueblo Rico, Parque Nacional Natural Tatamá, finca Montezuma 1379 m, 5°13'49.82" N, 76°04'58.93" W, 03.XI.2014, (G. Contreras, A. Montañez & J. Delgado): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05620). **Santander:** Barbosa, 1650 m, 14.V.2007 (S. Díaz): 2 ♂ apterous, 1 ♀ apterous (UPTC-In-05541). **Valle del Cauca:** Yotoco, 02.VII.2014, (J. Carvajal): 2 ♂ apterous, 4 ♀ apterous (UPTC-In-05542).

Rhagovelia malkini Polhemus, 1997

(Fig. 7A, 13B)

Rhagovelia malkini Polhemus, 1997: 235–237

Diagnosis. Body length: apterous male (~5.4), apterous female (~6.3), macropterous male (~5.8), macropterous female (~6.3). General color orange-brown; anterior band of pronotum slightly lighter-colored than remainder

of dorsum. Pronotum completely covering mesonotum. Lateral portions of mesosternum with 3–4 small black denticles. Proctiger not acuminate, not prolonged into spine-like process. Male fore tibia expanded distally; ventral surface with well-developed concavity. Posterolateral margins of male abdominal segment VII surrounding genital cavity with robust black denticles. Pronotum of macropterous female with elevated posterior projection. Basal portion of female middle femur not strongly flattened and concave; central section without transverse constriction. Anterolateral portions of apterous female abdominal mediotergites I–VII at most weakly pruinose, not contrasting with central portions. Central portion of apterous female abdominal mediotergite IV not covered by laterotergites, visible in dorsal view for entire length. Abdominal laterotergites of apterous female weakly convergent adjacent to mediotergites I–II, strongly convergent adjacent to III–IV, weakly convergent adjacent to remaining mediotergites, nearly meeting over posterior margin of tergum VIII. Abdominal mediotergite VII of apterous female lacking tuft of long, black setae on posterior margin. Abdominal tergum VIII of apterous female not completely covered by long, erect, black setae. Male paramere and proctiger as in Polhemus (1997: 235, figs. 264, 265).

Distribution. COLOMBIA: **Arauca** (this work), **Cesar** (Polhemus 1997), **Santander** (Aristizábal-García 2017) (Fig. 7A).

Material examined. **Arauca:** Tame, Vereda Brisas del Cravo, Quebrada cerca Río Cravo Norte, 500 m, 6°24'41" N, 71°50'10" W, 25.XI.2007, (F. Alvarado): 1 ♀ macropterous, 2 ♀ apterous (UPTC-In-05558).

***Rhagovelia perija* Polhemus, 1997**

(Fig. 7B, 13C)

Rhagovelia perija Polhemus, 1997: 252–254

Diagnosis. Body length: apterous male (~5.2), apterous female (~5.8), macropterous male (~5.1), macropterous female (~5.7). General color dark-brown, strongly contrasting with yellowish-brown on anterior band of pronotum and abdominal laterotergites. Antennomere IV lacking long, erect, black setae along anterior margin. Pronotum completely covering mesonotum. Anteromedial portion of proepisternum adjacent to labium with black denticles. Lateral portions of mesosternum without small, black denticles. Proctiger not acuminate, not prolonged into spine-like process. Male fore tibia expanded distally; ventral surface with well-developed concavity. Posterolateral margins of male abdominal segment VII surrounding genital cavity with robust, black denticles. Pronotum of macropterous female with elevated posterior projection. Basal portion of female middle femur not strongly flattened and concave; central section without transverse constriction. Central portion of apterous female abdominal mediotergite IV not covered by laterotergites, visible in dorsal view for entire length. Abdominal laterotergites of apterous female weakly convergent adjacent to mediotergites I–II, strongly convergent adjacent to III–IV, subparallel adjacent to remaining mediotergites. Abdominal mediotergite VII of apterous female with thick tuft of long, black setae on posterior margin. Abdominal tergum VIII of apterous female not completely covered by long, erect, black setae. Male paramere and proctiger as in Polhemus (1997: 252, figs. 269, 270).

Distribution. COLOMBIA: **Antioquia** (this work), **Cesar** (Polhemus 1997, this work), **Córdoba** (this work), **Cundinamarca** (this work), **La Guajira** (this work), **Magdalena** (this work), **Quindío** (Cobos-Vallejo *et al.* 2007), **Santander** (Aristizábal-García 2017, this work), **Tolima** (this work) (Fig. 7B). PANAMA (Rodrigues *et al.* 2021).

Material examined. **Antioquia:** Frontino, Quebrada Murindo, vía Dabeiba-Uramita, 784 m, 6°53'20.1" N, 76°14'40.8" W, 13.VIII.2016, (F. Molano): 4 ♂ apterous, 1 ♀ apterous (UPTC-In-05544). Vía Dabeiba-Mutata, 308 m, 7°01'39.9" N, 76°20'24.3" W, 13.VIII.2016, (F. Molano): 3 ♂ macropterous, 10 ♂ apterous, 5 ♀ apterous (UPTC-In-05546). Vía Dabeiba-Mutata, 315 m, 7°01'59.0" N, 76°21'03.7" W, (F. Molano): 10 ♂ apterous, 1 ♀ macropterous, 11 ♀ apterous (UPTC-In-05547). **Cesar:** Valledupar, Chemesquemena, Sierra Nevada de Santa Marta, 1800 m, I.2017, (J. Carvajal): 1 ♂ apterous (UPTC-In-05622). **Córdoba:** Tierralta, Río Manso, 12.XII.2008, (N. Nonzoque): 1 ♂ macropterous, 4 ♀ apterous (UPTC-In-05543). **Cundinamarca:** Guaduas, 5°3'21" N, 74°35'31" W, 990 m, 02.I.2021, (I. Morales): 1 ♂ macropterous, 3 ♂ apterous, 2 ♀ apterous (UPTC-In-10845). Viotá, Reserva Natural Camino Verde, 10.V.2017, (I. Morales): 2 ♂ macropterous, 2 ♀ macropterous (UPTC-In-05624). **La Guajira:** Angostura, Quebrada El Manguito, 2017, (J. Eguis): 1 ♀ macropterous, 3 ♀ apterous (UPTC-In-05611). **Magdalena:** Santa Marta, Minca, 11.IV.2016, (I. Morales): 1 ♂ macropterous, 1 ♂ apterous, 1 ♀ macropterous,

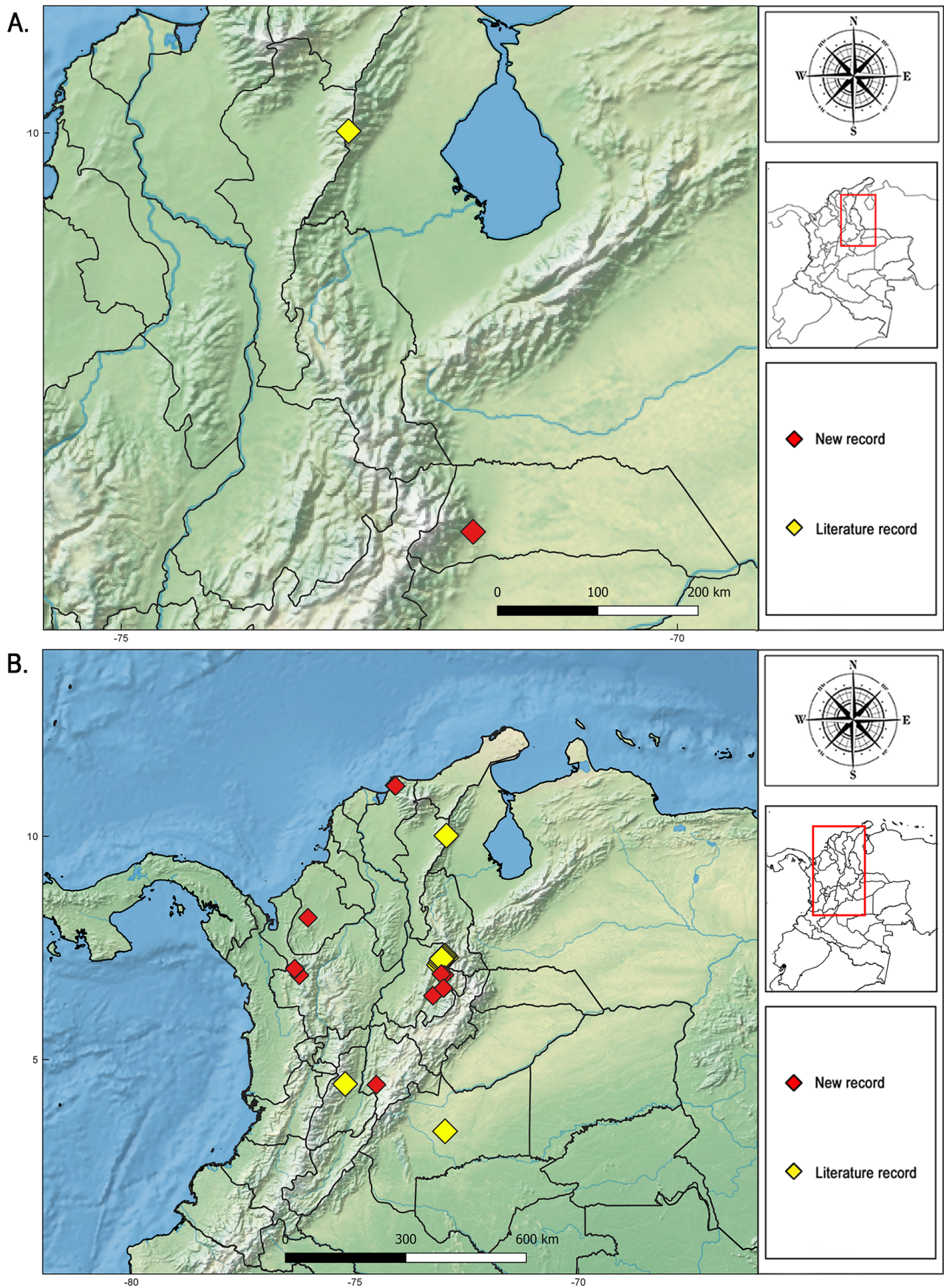


FIGURE 7. Geographic distributions in Colombia of **A.** *Rhagovelia malkini*; **B.** *Rhagovelia perija*.

3 ♀ apterous (UPTC-In-05545). Santa Marta, Sierra Nevada de Santa Marta, hacienda La Victoria, Jabalí bajo, 1151 m, 19.IV.2007, (L. Jiménez): 1 ♀ apterous (UPTC-In-05612). **Santander:** Los Santos, Salto del Mico, punto 14, 1603 m, 6°54'53.1" N, 73°4'12.2" W, 21.IX.2017, (I. Morales & F. Molano): 3 ♂ macropterous, 10 ♂ apterous, 1 ♀ macropterous, 12 ♀ apterous (UPTC-In-05552). Piedecuesta, Punto 9, 930 m, 6°53'43.2" N, 73°02'24.8" W, 21.IX.2017, (F. Molano & I. Morales): 2 ♂ macropterous, 12 ♂ apterous, 1 ♀ macropterous, 12 ♀ apterous (UPTC-In-05548). Piedecuesta, Punto 10, 930 m, 6°53'43.2" N, 73°02'24.8" W, 21.IX.2017, (I. Morales & F. Molano): 1 ♂ macropterous, 8 ♂ apterous, 5 ♀ apterous (UPTC-In-05551). Socorro, Vereda La Culebra, Quebrada La Honda, punto 3, 1348 m, 6°25'47.3" N, 73°15'30.1" W, 20.IX.2017, (F. Molano & I. Morales): 12 ♂ apterous, 1 ♀ macropterous 3 ♀ apterous (UPTC-In-05549). Socorro, Vereda La Culebra, Quebrada La Honda, punto 3, 1348 m, 6°25'47.3" N, 73°15'30.1" W, 20.IX.2017, (I. Morales & F. Molano): 2 ♀ apterous (UPTC-In-05557). Guayaacanal, P4, 10.XII.2014, (N. Tórres): 1 ♀ apterous (UPTC-In-05550). Guayaacanal, P1, 27.I.2015, (N. Tórres): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05556). Quebrada La Laja, límites Barichara, San Gil y Villanueva, Punto 7, 1501 m, 6°35'56.8" N, 73°01'17.8" W, 20.IX.2017, (F. Molano & I. Morales): 18 ♂ apterous, 16 ♀ apterous (UPTC-In-05554). **Tolima:** Ibagué, Jardín Botánico San Jorge. Quebrada Arrubia, 27.VI.2003, (Camacho): 1 ♂ macropterous, 15 ♂ apterous, 2 ♀ macropterous, 3 ♀ apterous (CIUQ). Ibagué, Jardín Botánico San Jorge, L. Bachué, 1100 m, 27.VI.2003, (Camacho): 1 ♂ macropterous, 7 ♂ apterous, 1 ♀ macropterous, 5 ♀ apterous (CIUQ). Ibagué, Jardín Botánico San Jorge, Estanque artificial, 27.VI.2003, (Camacho): 3 ♂ macropterous (CIUQ).

Rhagovelia robusta complex

Rhagovelia elegans group

Rhagovelia elegans Uhler, 1894

(Fig. 4C–E, 8A)

Rhagovelia elegans Uhler, 1894: 216–217.

Rhagovelia insularis Champion, 1898:135. Syn. by Polhemus (1997: 119).

Rhagovelia costalimai Drake, 1948:142. Syn. by Polhemus (1997: 119).

Rhagovelia trinidadalis Drake, 1948:143. Syn. by Polhemus (1997: 119).

Rhagovelia gorgona Manzano, Nieser & Caicedo, 1995: 54. Syn. by Padilla-Gil & Moreira (2013: 410).

Rhagovelia pediformis Padilla-Gil, 2010a: 293. **Syn. nov.**

Remarks. After examining the type material of *R. pediformis*, we found that the body color and structural characteristics (Figs. 4C–E) are within the range of variation observed for *R. elegans* in material from different localities and reported in numerous publications (Moreira & Ribeiro 2009; Moreira *et al.* 2010, 2012, 2015, 2016; Moreira & Campos 2012; Dias-Silva *et al.*, 2013; Cordeiro & Moreira, 2015; Moreno *et al.* 2018; Giehl *et al.* 2020). The measurements presented in the description of *R. pediformis* are considerably larger than those observed on the type specimens. Padilla-Gil (2010a) reported a body length of 5.70 mm for the male, when in reality it measures approximately 4.50 mm, and 5.60 mm for the female, when it is actually approximately 4.20 mm long (Table 2). The apex of the male proctiger is not as wide as that presented by Padilla-Gil (2010a: 294, fig. 3), and is very similar to that presented by Polhemus (1997: 127, fig. 106) for *R. elegans*. Furthermore, the paramere is almost identical to the one presented by Bacon (1956) for *R. elegans*. Finally, Polhemus (1997) had commented on the intraspecific variation of *R. elegans*, stating that widely separated populations had been described as distinct species by different authors, but with no consistent differences among them. This led him to treat *R. costalimai* Drake, 1948, *R. insularis* Champion, 1898, and *R. trinidadalis* Drake, 1948 as synonyms of *R. elegans*. Accordingly, we consider *R. pediformis* to be a synonym of the last species. *Rhagovelia gorgona* Manzano, Nieser & Caicedo, 1995 is yet another synonym of *R. elegans*, as determined by Padilla-Gil & Moreira (2013).

Distribution. BRAZIL (Gould 1931). COLOMBIA: **Amazonas** (Polhemus 1997), **Antioquia** (Aristizábal-García 2017), **Caldas** (this work), **Casanare** (Aristizábal-García 2017), **Cauca** (Bacon 1956, Manzano *et al.* 1995), **Cesar** (Aristizábal-García 2017), **Chocó** (this work), **Córdoba** (this work), **Cundinamarca** (Aristizábal-García 2017), **Huila** (this work), **Magdalena** (Polhemus 1997, this work), **Meta** (Aristizábal-García 2017, this work), **Nariño** (Padilla-Gil 2010a, 2013, 2017), **Norte de Santander** (this work), **Quindío** (Morales-Castaño & Molano-

Rendón 2008, Aristizábal-García 2017, this work), **Santander** (this work), **Sucre** (Aristizábal-García 2017, Moreno *et al.* 2018), **Tolima** (Parra-Trujillo *et al.*, 2014; this work), **Valle del Cauca** (Polhemus 1997, Morales-Castaño & Molano-Rendón 2008, this work), **Vichada** (this work) (Fig. 8A). COSTA RICA (Polhemus 1997). DOMINICA (Bacon 1956). ECUADOR (Polhemus 1997). GRENADA (Uhler 1894). HISPANIOLA ISLAND (Polhemus 1997). MARTINIQUE (de Kort-Gommers & Nieser 1969). PANAMA (Champion 1898). ST. KITTS & NEVIS (Bacon 1956). ST. LUCIA (Polhemus 1997). ST. VINCENT & THE GRENADINES (Uhler 1893). TRINIDAD & TOBAGO (Gould 1931). VENEZUELA (Hungerford 1944).

TABLE 2. Comparison between measurements (in mm) provided in the original descriptions of the species herein synonymized with *Rhagovelia cauca* and *R. elegans*, and the type material upon which the descriptions were based.

Species	Synonyms	Original description		Type material	
		Apterous♂	Apterous♀	Apterous♂	Apterous♀
<i>R. cauca</i> Polhemus, 1997	<i>R. azulita</i> Padilla-Gil, 2009	7.06	7.60	~ 5.0	~ 5.8
	<i>R. huila</i> Padilla-Gil, 2009	6.90	8.00	~ 5.0	~ 5.9
	<i>R. oporapa</i> Padilla-Gil, 2009	6.90	8.26	~ 5.3	~ 6.0
	<i>R. quilichaensis</i> Padilla-Gil, 2011	6.00	7.20	~ 4.9	~ 5.4
<i>R. elegans</i> Uhler, 1894	<i>R. pediformis</i> Padilla-Gil, 2010	5.70	5.60	~ 4.5	~ 4.2

Type material examined. Holotype apterous ♂, allotype apterous ♀ of *R. pediformis* (ICN): ‘Colombia, Nariño, Tumaco, Río Mejicano, Vereda El Retorno, 4 II 2009 D. Padilla, leg.’

Additional material examined. **Caldas:** Norcasia, Río Manso, quebrada 1, 07.X.2016, (C. Llano): 11 ♂ apterous, 2 ♀ macropterous, 5 ♀ apterous (UPTC-In-05583). **Chocó:** Acandí, Capurganá, quebrada camino al Cielo, 12.VII.2015, (F. Molano): 1 ♀ apterous (UPTC-In-05585). Acandí, Capurganá, Cascada Sap. 2, 20.I.2008, (J. López): 1 ♂ macropterous (UPTC-In-05582). Acandí, Capurganá, camino a Sapzurro, 8°37’37.89” N, 77°20’53.16” W, 15.I.2008, (López *et al.*): 1 ♂ macropterous (UPTC-In-05585). Bahía Solano, Corregimiento El Valle, 4 m, 6°06’46.6” N, 77°26’05.7” W, 03.XI.2016, (F. Molano): 8 ♂ apterous, 9 ♀ apterous (UPTC-In-05596). Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, playa Cocalito, quebrada Cocalito, 0 m, 05.XI.2016, (F. Molano): 1 ♀ apterous (UPTC-In-05600). Bahía Solano, Corregimiento El Valle, 12 m, 6°06’11.6” N, 77°26’03.5” W, 04.XI.2016, (F. Molano): 8 ♂ apterous, 3 ♀ apterous (UPTC-In-05601). Bahía Solano, Corregimiento El Valle, 2 m, 6°06’57.0” N, 77°26’13.2” W, 03.XI.2016, (F. Molano): 2 ♂ apterous, 2 ♀ apterous (UPTC-In-05602). Bahía Solano, Corregimiento El Valle, 112 m, 6°06’53.7” N, 77°25’57.0” W, 04.XI.2016, (F. Molano): 3 ♂ apterous, 6 ♀ apterous (UPTC-In-05603). Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, Playa Cocalito, 0 m, 05.XI.2016, (F. Molano): 1 ♂ macropterous, 13 ♂ apterous, 1 ♀ macropterous, 18 ♀ apterous (UPTC-In-05604). Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, playa La Aguada, quebrada La Aguada, 0 m, 05.XI.2016, (F. Molano): 4 ♂ apterous, 5 ♀ apterous (UPTC-In-05605). Bahía Solano, Corregimiento El Valle, 19 m, 6°7’10.8” N, 77°26’24.5” W, 04.XI.2016, (F. Molano): 1 ♂ macropterous, 3 ♂ apterous, 5 ♀ apterous (UPTC-In-05606). Bahía Solano, Corregimiento El Valle, 100 m, 6°6’51.8” N, 77°25’51.7” W, 04.XI.2016, (F. Molano): 11 ♂ apterous, 9 ♀ apterous (UPTC-In-05607). Bahía Solano, Corregimiento El Valle, 98 m, 6°6’54.3” N, 77°25’57.2” W, 04.XI.2016, (F. Molano): 12 ♂ apterous, 2 ♀ macropterous, 16 ♀ apterous (UPTC-In-05608). Bahía Solano, Corregimiento El Valle, 20 m, 6°6’47.7” N, 77°26’03.7” W, 04.XI.2016, (F. Molano): 17 ♂ apterous, 1 ♀ macropterous, 9 ♀ apterous (UPTC-In-05609). Bahía Solano, Corregimiento El Valle, 18 m, 6°07’08.7” N, 77°20’23.8” W, 04.XI.2016, (F. Molano): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05621). Nuquí, Quebrada Jovi con La Chantadura, Sitio 9, 20 m, 5°36’5” N, 77°23’42” W, 21.X.2017, (F. Molano & I. Morales): 1 ♂ apterous (UPTC-In-05592). Nuquí, Sector Terquito, Sitio 16, 8 m, 5°37’29” N, 77°25’18” W, 22.X.2017, (I. Morales & F. Molano): 1 ♀ apterous (UPTC-In-05593). Nuquí, Bejuquillal adentro, sitio 6, 20.X.2017, (F. Molano & I. Morales): 10 ♂ apterous, 7 ♀ apterous (UPTC-In-05594). Nuquí, Termales, 22.X.2017, (I. Morales & F. Molano): 1 ♂ apterous, 3 ♀ apterous (UPTC-In-05595). Nuquí, Quebrada Piedra Piedra, Sitio 14, 8 m, 5°37’29” N, 77°25’18” W, 22.X.2017, (F. Molano & I. Morales): 3 ♂ apterous, 4 ♀ apterous (UPTC-In-05597). Nuquí, Quebrada Jovi con La Chantadura, Sitio 9, 20 m, 5°36’5” N, 77°23’42” W, 21.X.2017, (F. Molano & I. Morales): 1 ♀ apterous (UPTC-In-05598). Nuquí, Sector Terquito, Sitio 17, 8 m, 5°37’29” N, 77°25’18” W, 22.X.2017, (I. Morales & F. Molano): 5 ♂ apterous, 2 ♀ apterous (UPTC-In-05599). Riosucio, 150 m, 7°14’33.30” N, 76°33’51.77” W, V.2015, (J. García): 3 ♂ macropterous, 1 ♂

apterous, 2 ♀ macropterous (UPTC-In-05577). Riosucio, 15.VII.2015: 1 ♀ apterous (UPTC-In-05581). **Córdoba:** Valencia, 08.XII.2008 (N. Nonzoque & V. Bernal): 3 ♀ apterous (UPTC-In-05580). **Huila:** Quebrada El Neme, 820 m, 3°04'28" N, 75°23'50" W, 15.VII.2015, (N. Torres): 1 ♂ macropterous, 1 ♀ macropterous, 1 ♀ apterous (UPTC-In-05587). **Magdalena:** Santa Marta, Minca, 11.IV.2016, (I. Morales): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05584). Santa Marta, PNN Tayrona, Caño arrrecife, camino, 23.X.2004, (F. Molano): 1 ♂ macropterous (CIUQ). **Meta:** Puerto López, Vía Puerto López-Puerto Gaitán, 204 m, 4°07'00.3" N, 72°48'10.7" W, 14.X.2016, (F. Molano): 1 ♂ apterous, 2 ♀ apterous (UPTC-In-05578). San Martín, Vereda Puerto Castro, finca Mararay, caño Colorado, 215 m, 3°28'01.99" N, 72°32'16.15" W, 14.VII.2018, (D. Martínez): 1 ♂ apterous. Villavicencio, Jardín Botánico, 650 m, 4°9'00" N, 73°39'20" W, 29.III.2011, (M. Loaiza): 1 ♂ macropterous, 1 ♀ macropterous (UPTC-In-05817). **Norte de Santander:** Cúcuta, Caño Las Cruces, punto 8, 23.VII.2010, (N. Tórres): 2 ♂ apterous, 1 ♀ apterous (UPTC-In-05586). **Quindío:** Ulloa-Higuerón, quebrada Higuerón, 1000 m, 09.VII.2005, (I. Morales): 1 ♀ macropterous (UPTC-In-05589). Quimbaya, Vereda El Laurel, Reserva Natural La Montaña del Ocaso, 988 m, 4°34'51" N, 75°51'37" W, 25.IV.2018, (D. Martínez): 1 ♂ macropterous, 6 ♂ apterous, 3 ♀ macropterous, 7 ♀ apterous (UPTC-In-05818). **Santander:** Piedecuesta, Punto 9, 930 m, 6°53'43.2" N, 73°02'24.8" W, 21. IX.2017, (F. Molano & I. Morales): 9 ♂ apterous, 1 ♀ macropterous, 2 ♀ apterous (UPTC-In-05590). **Tolima:** Ibagué, Jardín Botánico San Jorge, Quebrada Arrubia, 23.VI.2003, (Camacho): 3 ♀ macropterous, 3 ♀ apterous, 5 ♂ apterous (CIUQ). **Valle del Cauca:** Alcalá, 1078 m, 09.VII.2005, (F. Molano): 1 ♂ macropterous, 5 ♂ apterous, 1 ♀ macropterous, 2 ♀ apterous (UPTC-In-05588). **Vichada:** Puerto Carreño, Finca La Alegria, Caño Villa Maydi, 85 m, 5°35'54.4" N, 68°30'19.4" W, 06.VI.2018, (D. Martínez): 4 ♀ macropterous (UPTC-In-05866).

Rhagovelia hirtipes group

Rhagovelia femoralis Champion, 1898

(Fig. 8B, 13D)

Rhagovelia femoralis Champion, 1898: 138.

Diagnosis. Body length: apterous male (~4.1), apterous female (~4.5), macropterous male (~4.5), macropterous female (~4.5). General color black. Pronotum of apterous form completely covering mesonotum. Apical spur of hind tibia straight. Male pronotum and abdominal mediotergites thickly covered by appressed, silvery setae. Male abdominal sterna with raised median carina. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Venter of male abdominal segment VIII without conical process, usually with a low median carina. Male paramere as in Polhemus (1997: 112, fig. 84). Pronotum of macropterous female without elevated posterior projection. Apterous female abdomen with median carina dorsally. Apterous female laterotergites and tergum VIII without long tufts of black setae on posterolateral angles; laterotergites not markedly thickened nor mesally bowed and glabrous adjacent to mediotergites III–V.

Distribution. COLOMBIA: **Antioquia** (this work), **Chocó** (this work), **Nariño** (Padilla-Gil 2016), **Quindío** (this work), **Valle del Cauca** (Polhemus 1997) (Fig. 8B). COSTA RICA (Polhemus 1997). PANAMA (Champion 1898).

Material examined. **Antioquia:** Frontino, Quebrada Murindo, vía Dabeiba-Uramita, 784 m, 6°53'20.1" N, 76°14'40.8" W, 13.VIII.2016, (F. Molano): 1 ♂ macropterous, 1 ♂ apterous, 3 ♀ apterous (UPTC-In-05559). El Orejón, S.D, (J. Correa): 1 ♂ apterous, 1 ♀ macropterous, 1 ♀ apterous (UPTC-In-05888). **Chocó:** Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, 6.012456, -77.342574, 13.II.2019, (Galindo-Malagón X): 1 ♀ apterous (UPTC-In-00213). Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, 6.012456, -77.342574, 14.II.2019, 1 ♀ apterous (UPTC-In-00214). Bahía Solano, Corregimiento El Valle, Parque Nacional Natural Utría, 6.012456, -77.342574, 16.II.2019, 1 ♂ apterous (UPTC-In-00217). **Quindío:** Quimbaya, Vereda El Laurel, Reserva Natural La Montaña del Ocaso, 987 m, 4°34'48,38" N, 75°51'53,85" W, 24.IV.2018, (D. Martínez): 1 ♀ macropterous (UPTC-In-05822).

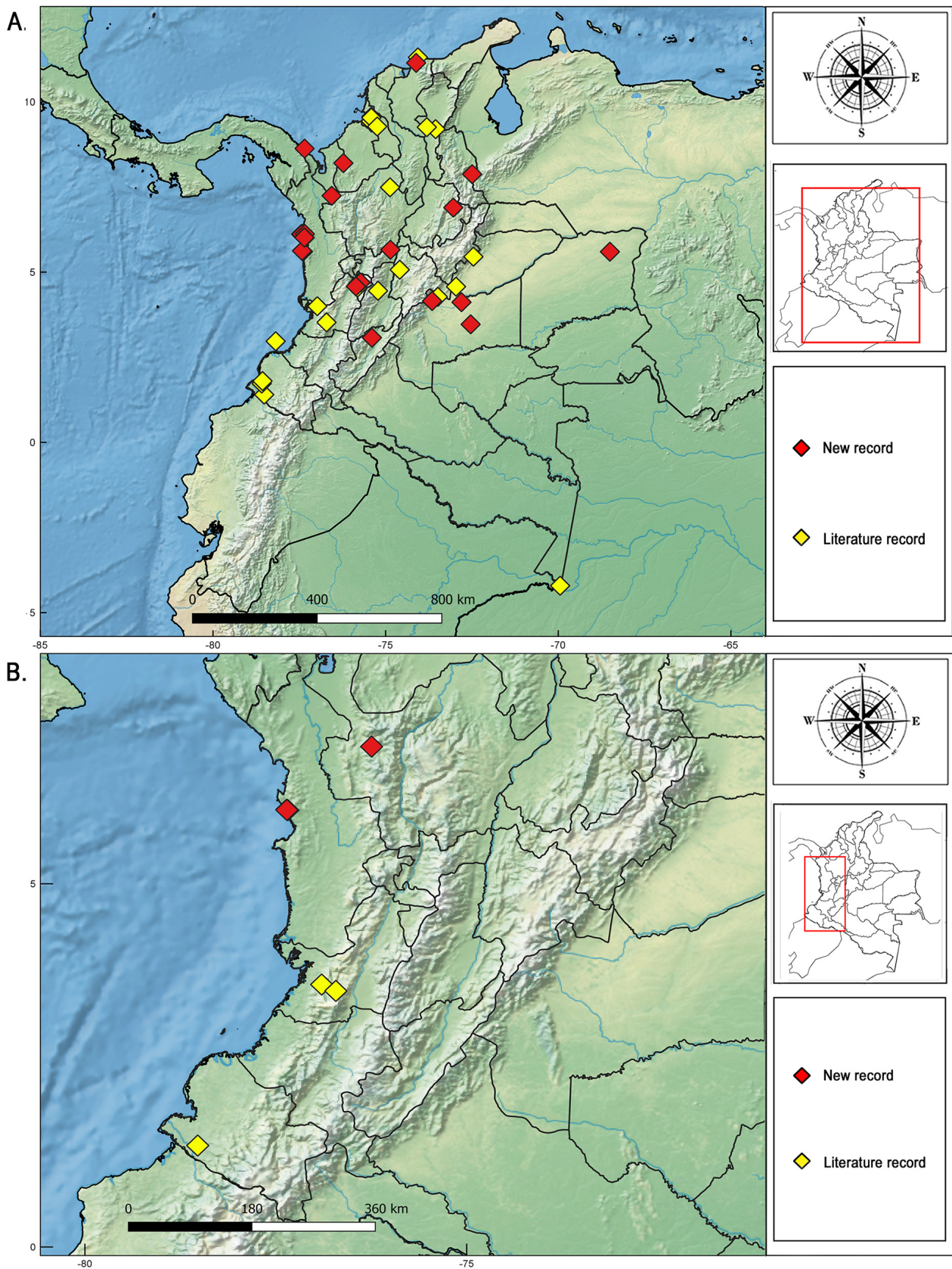


FIGURE 8. Geographic distributions in Colombia of A. *Rhagovelia elegans*; B. *Rhagovelia femoralis*.

***Rhagovelia utria*, sp. nov.**

(Table 1, Figs. 2, 3B, D, 5)

Apterous male. *Color and pilosity.* Body brown to black, covered by short, shiny, brown and greyish setae. Base of antennomere I pale-yellow; rest of antenna brown to dark-brown. Eye dark-red. Buccula yellowish-brown. Clypeus and labrum brown. Labium brown, yellowish proximally, darker and shiny distally. Anterior lobe of pronotum with a central trapezoidal yellowish mark bordered laterally by greyish pubescence. Posterior lobe of pronotum covered by dark-brown setae. Metanotum covered by greyish pubescence. Sides and venter of thorax greyish-black; intersegmental areas between pro- and mesosterna, and meso- and metasterna with a short, transverse, black stripe each. Proacetabulum yellowish-brown; mesoacetabulum black; metacetabulum black with yellowish margins. Fore and hind coxae and trochanters yellow in ventral view; middle coxa and trochanter brown; basal half of fore femur yellowish-brown; base of hind femur brown; apex of all femora, tibiae and tarsi dark-brown. Abdominal mediotergites I–VI and mesal portion of laterotergites black, covered by greyish pubescence; lateral portion of laterotergites brown; abdominal mediotergite VII laterally covered by greyish pubescence, centrally with a roughly triangular, bare, shiny black area. Abdominal sterna II–VI brown, darker laterally; VII mostly yellowish-brown. Terminalia dorsally black, ventrally brown. *Structure.* Head relatively short and wide, with erect black setae on frons; midline and two oblique basal foveae impressed and shining. Antennomere I thicker than others, slightly wider on apex, curved laterally, with seven robust erect black setae; II and III cylindrical, II with a pair of robust erect black setae; IV fusiform. Labium wide, reaching middle of mesosternum. Jugum, proepisternum, and thoracic sterna without black denticles. Pronotum without visible circular punctures, with curved lateral and posterior margins, and long black setae on sides. Mesonotum completely covered by pronotum. Metanotum short and wide. Thoracic and abdominal sterna covered by light-colored setae, more densely on sterna VII–VIII. Legs covered by short brown setae; lighter-colored, thinner, long setae on coxae and trochanters; rows of long, robust, black setae on femora and tibiae. Fore tibia with weak preapical concavity ventrally and grasping comb extending slightly beyond apex. Hind trochanter with 10 black pegs and two slightly longer spines (Fig. 2E). Hind femur incrassate, not surpassing apex of abdomen; basal third with 9–13 short black spines (Fig. 2E); apical two-thirds with two rows of spines – dorsal row with 11 spines decreasing in size distally, ventral row with nine subequal spines. Hind tibia straight, with obtuse spinules throughout posterior surface plus a straight apical spur, without long preapical spine. Abdominal mediotergites I–VI subrectangular; I–V with a median carina; VII slightly longer than wide; dorsum of abdominal segment VIII longer than mediotergite VII. Abdominal laterotergites not elevated. Abdominal sterna II–VI with weak triangular median carina; venter of abdominal segment VIII with stronger median carina. Posterolateral margins of abdominal segment VII without black denticles. Abdominal segment VIII cylindrical, wide, covered by long brown setae. Proctiger as in Fig. 3B. Parameres symmetrical, longer than wide, robust, wider on middle and tapering to apex (Fig. 3D).

Apterous female. Color and pilosity similar to male. Proacetabulum pale-yellow; meso- and metacetabula with yellowish-brown margins. Coxae and trochanters yellow; middle trochanter darker. Femur, tibia and tarsi lighter-brown ventrally than on male. Dorsum of abdominal segment VIII centrally shiny black. Abdominal sterna centrally brown, laterally dark brown with greyish setae. Hind trochanter with three small black pegs (Fig. 2E). Hind femur less incrassate than on male, with 6–7 black pegs on basal third (Fig. 2E); apical two-thirds with two rows of spines – dorsal row with eight spines decreasing in size distally, ventral row with six subequal spines. Hind tibia straight, with obtuse spinules on basal third of posterior surface, without apical spur or long preapical spine. Abdominal mediotergites I–V with median carina. Abdominal laterotergites sinuous, elevated, mesally bowed adjacent to mediotergites III–IV; lateral margins with abundant brown setae, expanded adjacent to mediotergites V–VII. Abdominal sterna without median carina.

Macropterous male. Similar to apterous male in general color, pilosity, and structure. Pronotum long, brown, with a yellow spot behind eyes; posterior margin rounded. Forewing surpassing apex of abdomen, with 2 basal and 2 apical closed cells; veins brown, except yellowish laterally on lateral apical cell (Fig. 2G). Small portion of abdominal laterotergites I–III visible dorsally.

Macropterous female. Similar to macropterous male in general color, pilosity, and structure. Pronotum without elevated posterior projection. All specimens with mutilated wings (Fig. 2F).

Comments. *Rhagovelia utria* sp. nov. is part of the *hirtipes* group of species, based on the pronotum of the apterous form completely covering the mesonotum, the pronotum of the macropterous female without a posterior elevated projection, the abdomen of the apterous female with a median carina dorsally on mediotergites I–V, and

the posterolateral margins of male abdominal segment VII surrounding the genital cavity lacking black denticles (Polhemus 1997). So far, 12 species are included in the *hirtipes* group, which has a disjunct distribution from Mexico to Colombia, and also in southeastern Brazil. The only species of the group heretofore recorded from Colombia is *R. femoralis* Champion, 1898, which can be distinguished from *R. utria* **sp. nov.** by the male hind tibia slightly arcuate on the basal two-thirds, with a large preapical spine; the male abdomen without a median carina dorsally; the female abdominal laterotergites lacking a mesally bowed and glabrous area adjacent to mediotergites III–V; and the male abdominal segment VIII with a low median carina ventrally (Bacon 1956, Polhemus 1997). In *R. utria* **sp. nov.**, the male hind tibia is cylindrical and lacks a large preapical spine; the male abdomen has a median carina on mediotergites I–VI; the female laterotergites III–IV are mesally bowed; and the ventral carina of the male abdominal segment VIII is stronger than on anterior segments.

Two other species of the group occur close to Colombia: *R. chiriqui* Polhemus, 1997, in Panama, and *R. reclusa* Polhemus, 1997, in Costa Rica. *Rhagovelia chiriqui* can be distinguished from *R. utria* **sp. nov.** by the golden-brown bowed portion of the female laterotergites adjacent to mediotergites III–V and by the shape of the paramere (Polhemus 1997: fig. 93). *Rhagovelia reclusa* differs from the new species by the margins of female abdominal laterotergites adjoining the mediotergites V–VII flat and covered by numerous black setae, and the male hind trochanter with seven black pegs (Polhemus 1997). In *R. utria* **sp. nov.**, the male hind trochanter has about 10 black pegs and two longer spines, the lateral portion of the female laterotergites are concolorous brown throughout the abdomen, the female abdominal laterotergites adjoining the mediotergites V–VII are expanded, and the paramere is shaped as in Fig. 3D.

Etymology. This new species is named in honor of Utria Natural National Park, Chocó, Colombia.

Distribution. Colombia: **Chocó** (this work) (Fig. 5).

Type material examined. Holotype apterous ♂ (UPTC-In-10861): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Parque Nacional Natural Utria \ Quebrada La Cascada \ 5m \ 6°0’58.32” N, 77°21’17.09” W \ 16.II.2019 \ Col: D. Martínez’. Paratypes 4 ♂ apterous, 1 ♂ macropterous (wings mutilated), 2 ♀ apterous, 1 ♀ macropterous (wings mutilated) (UPTC-In-0138): same data as holotype. Paratype apterous 1 ♀ (UPTC-In-10862): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 2m \ 6°6’57” N, 77°26’13.2” W \ 03.XI.2016 \ Col: F. Molano’. Paratypes 4 ♂ apterous, 1 ♀ macropterous (wings mutilated), 5 ♀ apterous (UPTC-In-10839) ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 75m \ 6°6’47.4” N, 77°26’4.2” W \ 03.XI.2016 \ Col: F. Molano’. Paratypes 1 ♀ macropterous (wings mutilated), 1 ♀ apterous (UPTC-In-10840): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 98m, 6°6’54.3” N, 77°25’57.2” W \ 04.XI.2016 \ Col: F. Molano’. Paratypes 1 ♀ macropterous (wings mutilated), 1 ♀ apterous (UPTC-In-10841): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 112m \ 6°6’53.7” N, 77°25’57.0” W \ 04.XI.2016 \ Col: F. Molano’. Paratypes 1 ♂ macropterous, 3 ♂ apterous, 1 ♀ apterous (UPTC-In-10842): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 19m \ 6°7’10.8” N, 77°26’24.5” W \ 04.XI.2016 \ Col: F. Molano. Paratype 9 ♂ apterous, 1 ♀ macropterous (wings mutilated), 1 ♀ apterous (UPTC-In-10843): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 18m \ 6°7’8.7” N, 77°26’23.8” W \ 04.XI.2016 \ Col: F. Molano. Paratypes 1 ♂ macropterous, 5 ♂ apterous, 1 ♀ macropterous (wings mutilated), 5 ♀ apterous (UPTC-In-10844): ‘Colombia \ Chocó \ Bahía Solano \ Corregimiento El Valle \ Quebrada \ 20m \ 6°6’47.7” N, 77°26’3.7” W \ 04.XI.2016 \ Col: F. Molano’.

***Rhagovelia robusta* group**

***Rhagovelia castanea* Gould, 1931**

(Fig. 9A, 13E)

Rhagovelia castanea Gould, 1931:19

Diagnosis. Body length: apterous male (~4.2), apterous female (~4.4). General color orange-brown. Pronotum of apterous form completely covering mesonotum. Male proepisternum without minute black denticles. Apterous male hind trochanter with 4–5 small spines and a larger spine. Apterous male hind femur swollen, with a relatively poorly organized set of spine rows. Apterous male hind tibia with obtuse pegs throughout length, a larger preapical spine,

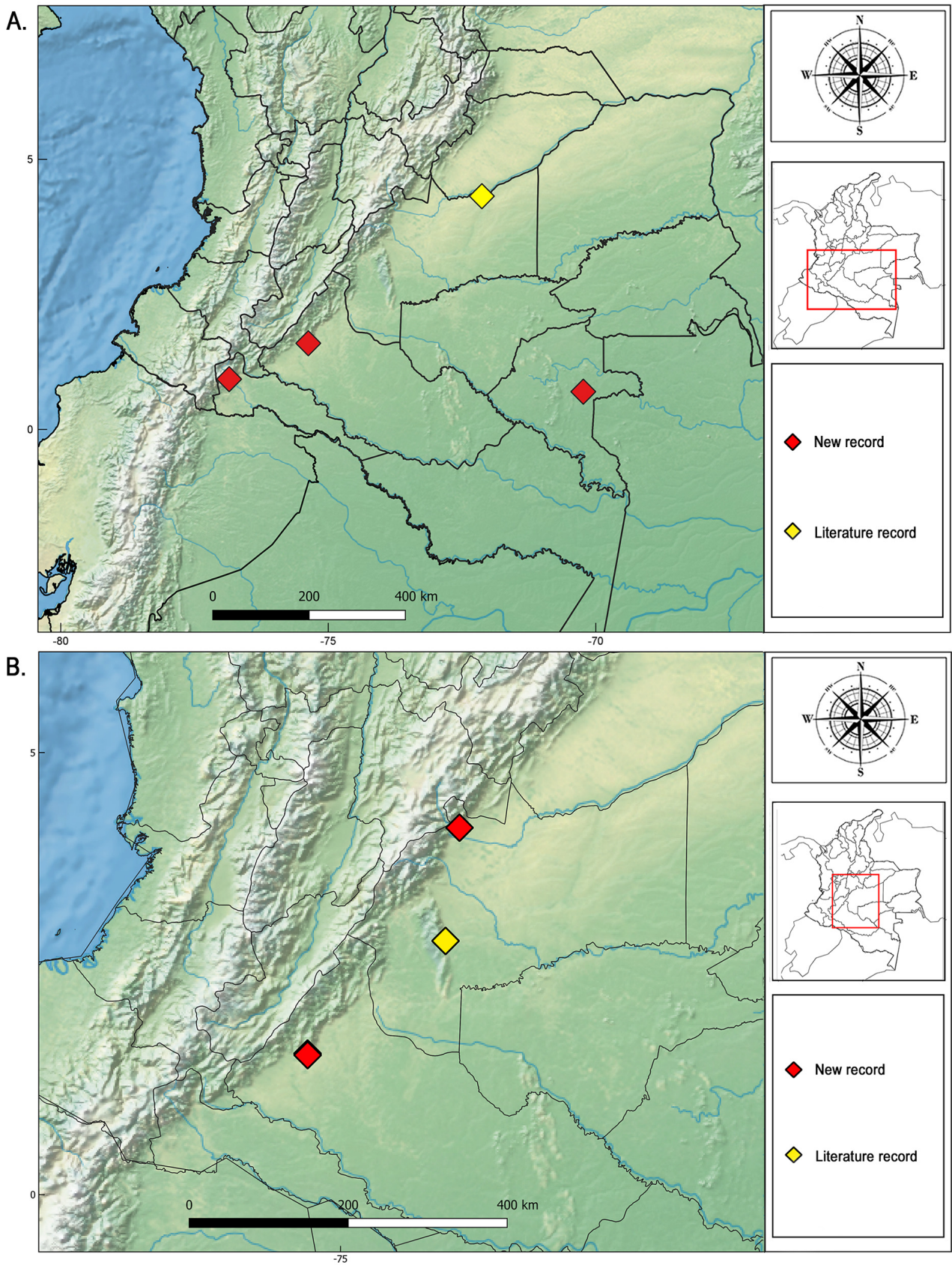


FIGURE 9. Geographic distributions in Colombia of **A.** *Rhagovelia castanea*; **B.** *Rhagovelia sinuata*.

and a straight apical spur. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Male paramere as in Polhemus (1997: 185, fig. 138). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. COLOMBIA: **Caquetá** (this work), **Putumayo** (this work), **Meta** (Aristizábal-García 2017), **Vaupés** (this work) (Fig. 9A). ECUADOR (Gould 1931). VENEZUELA (Polhemus 1997).

Material examined. **Caquetá:** El Paujil, Vereda La Sonora, 1217 m, 1°35.769' N, 75°22.37' W, 03.VII.2010, (C. Flórez & V. Sánchez): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05947). El Paujil, Vereda La Sonora, 1217 m, 1°35.769' N, 75°22.37' W, 21.XI.2017, (C. Flórez & V. Sánchez): 2 ♂ apterous, 3 ♀ apterous (UPTC-In-05948). **Putumayo:** Villagarzón, Vereda Alto del Tigre, Quebrada del Chuquio, RBS, 723 m, 03.VII.2010, (N. Torres): 1 ♂ apterous, 1 ♀ apterous (UPTC-In-05946). **Vaupés:** Mitú, Comunidad Indígena Acaricuara, Caño Paca, 16.XI.2008, (R. Pedroza): 2 ♂ apterous (UPTC-In-05563). Mitú, Comunidad Indígena Acaricuara, 23.VIII.2008, (R. Pedroza): 2 ♂ apterous, 2 ♀ apterous (UPTC-In-05565).

***Rhagovalia sinuata* Gould, 1931**

(Fig. 9B, 13F)

Rhagovalia sinuata Gould, 1931: 42

Diagnosis. Body length: apterous male (~4.2), apterous female (~4.5), macropterous male (~4.1), macropterous female (~4.4). General color orange-brown. Pronotum of apterous form completely covering mesonotum. Male jugum and proepisternum with numerous minute, black denticles. Male mesosternum without black denticles laterally. Apterous male hind trochanter with 2–4 small subequal spines. Apterous male hind femur with dorsal spine row containing two spines of much larger size than the others separated by 4–5 smaller spines. Apterous male hind tibia straight, with small pegs throughout length and a straight apical spur. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Male paramere as in Polhemus (1997:185, fig. 141). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. COLOMBIA: **Caquetá** (this work), **Meta** (Polhemus 1997, this work), **Norte de Santander** (this work) (Fig. 9B). ECUADOR (Gould 1931). PERU (Bacon 1956). VENEZUELA (Polhemus 1997).

Material examined. **Caquetá:** El Paujil, Vereda La Sonora, 1217 m, 1°35.769' N, 75°22.370' W, 25.XI.2017, (C. Flórez & V. Sánchez): 1 ♂ macropterous, 27 ♂ apterous, 38 ♀ apterous (UPTC-In-05862). El Paujil, Vereda La Cristalina, 665 m, 1°34.699' N, 75°22.300' W, 25.XI.2017, (C. Flórez & V. Sánchez): 1 ♂ apterous (UPTC-In-05863). **Meta:** Villavicencio, Jardín Botánico, 650 m, 4°9'00" N, 73°39'20" W, 29.III.2011 (M. Loaiza): 2 ♂ macropterous, 1 ♂ apterous, 4 ♀ macropterous, 1 ♀ apterous (UPTC-In-05865). **Norte de Santander:** Asiria, Belén, 20.IV.2019, (A. Lopera): 1 ♂ macropterous, 1 ♂ apterous, 2 ♀ apterous (UPTC-In-05878).

***Rhagovalia trailii* (Buchanan-White, 1879)**

(Fig. 10A, 14A)

Neovelgia trailii Buchanan-White, 1879: 487.

Rhagovalia perfidiosa Bacon, 1948: 81. Syn. by Polhemus & Polhemus (1985: 168).

Rhagovalia trailii; Kirkaldy & Torre-Bueno (1908: 206), Polhemus & Polhemus (1985: 168), Polhemus (1997: 174), Pereira & Melo (2007: 645), Moreira *et al.* (2011: 26), Padilla-Gil & Moreira (2013: 415), Moreira & Barbosa (2014: 599), Cordeiro & Moreira (2015: 21), Floriano & Moreira (2015: 440), Magalhães *et al.* (2016: 591), Aristizábal-García (2017: 303), Magalhães *et al.* (2019: 395). Incorrect subsequent spelling.

Diagnosis. Body length: apterous male (~3.0), apterous female (~3.3), macropterous male (~3.5), macropterous female (~3.5). General color brown with silvery pruinose markings. Pronotum of apterous form completely covering mesonotum. Abdominal mediotergites V–VI pruinose laterally with ovate, brown spots centrally; VII with a dark-yellowish spot centrally. Male jugum and proepisternum with minute, black denticles. Apterous male hind trochanter with 1–9 small subequal spines and one larger spine near apex. Apterous male hind femur with a long, sharp

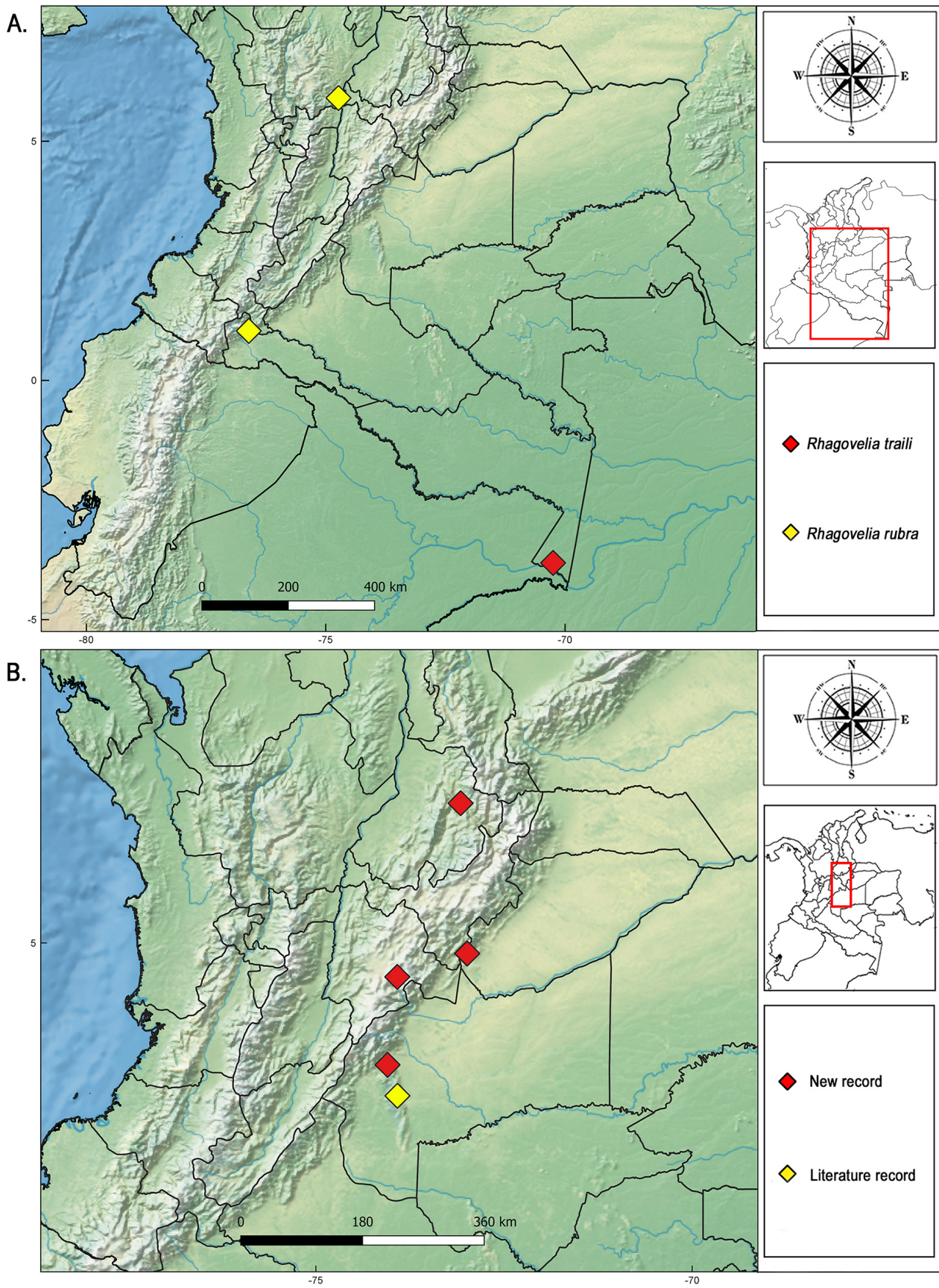


FIGURE 10. Geographic distributions in Colombia of **A.** *Rhagovelia trailii* and *R. rubra*; **B.** *Rhagovelia venezuelana*.

spine removed dorsally from the two main rows of spines. Apterous male hind tibia slightly arcuate, with small pegs throughout length and a straight apical spur. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Male paramere as in Polhemus (1997:185, fig. 131). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. BRAZIL (White 1879). COLOMBIA: **Amazonas** (this work) (Fig. 10A). FRENCH GUIANA (Polhemus 1997). PERU (Polhemus 1997). SURINAME (Polhemus 1997). VENEZUELA (Polhemus 1997).

Material examined. Amazonas: Leticia, Relleno Sanitario, Quebrada La Beatriz, Punto 31, XII.2013, (N. Tórres): 1 ♂ apterous, 2 ♀ apterous (UPTC-In-05613).

***Rhagovalia venezuelana* Polhemus, 1997**

(Fig. 10B, 14B)

Rhagovalia venezuelana Polhemus, 1997:175–179

Diagnosis. Body length: apterous male (~4.6), apterous female (~4.6), macropterous male (~4.7), macropterous female (~4.8). General color dark orange-brown, with anterior band of pronotum lighter-yellowish to orange-brown. Pronotum of apterous form completely covering mesonotum. Minute black denticles present on male jugum, proepisternum, meso- and metasterna, and centrally on abdominal sterna. Apterous male hind trochanter with 5 small subequal spines. Apterous male hind tibia weakly recurved and S-shaped, cylindrical, with small black pegs increasing in size distally, with final four pegs smaller than those immediately preceding, and a straight apical spur. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Male paramere as in Polhemus (1997: 185, fig. 146). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. COLOMBIA: **Casanare** (this work), **Cundinamarca** (this work), **Meta** (Polhemus 1997, this work), **Santander** (this work) (Fig. 10B). PANAMA (Polhemus 1997). VENEZUELA (Polhemus 1997).

Material examined. Casanare: Sabanalarga, Vereda Agua Clara, 1089 m, 4°51'36.98" N, 72°59'24.00" W, 17.XI.2017, (D. Martínez): 10 ♂ macropterous, 6 ♂ apterous, 1 ♀ macropterous, 13 ♀ apterous (UPTC-In-05618). Sabanalarga, Vereda Agua Clara, 1021 m, 4°51'36.98" N, 72°59'15.71" W, XI.2017, (D. Martínez): 5 ♂ macropterous, 1 ♂ apterous, 3 ♀ macropterous, 1 ♀ apterous (UPTC-In-05619). **Cundinamarca:** Choachi, Cerca de Termas Santa Mónica, 1807 m, 4°32'55.5" N, 73°55'04.1" W, 15.X.2016, (F. Molano): 2 ♂ apterous (UPTC-In-05569). **Meta:** Mesetas, Q. N. Vereda La Reforma, 22.IX.2016, (N. Tórres): 1 ♂ apterous, 5 ♀ apterous (UPTC-In-05568). **Santander:** Guayacanal, P9, 17.II.2015, (N. Tórres): 4 ♂ macropterous, 26 ♂ apterous, 27 ♀ apterous (UPTC-In-05572).

***Rhagovalia williamsi* Gould, 1931**

(Fig. 11A, 14C)

Rhagovalia williamsi Gould, 1931: 47.

Diagnosis. Body length: apterous male (~2.9), apterous female (~3.1). General color dark-brown, with anterior band of pronotum lighter-yellowish. Pronotum of apterous form completely covering mesonotum. Male proepisternum lacking minute black denticles. Apterous male hind trochanter with 3–4 small subequal spines and one longer spine. Apterous male hind femur with one moderate spine at basal 1/3, followed by a longer spine near the middle, then by 7–8 decreasing spines to apex. Apterous male hind tibia with two rows of subequal pegs throughout length and a straight apical spur. Male paramere as in Polhemus (1997: 185, fig. 128). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. COLOMBIA: **Putumayo** (Padilla-Gil 2014, 2019a, b; this work), **Vaupés** (Aristizábal-García 2017, this work) (Fig. 11A). ECUADOR (Gould 1931).

Material examined. Putumayo: Orito, Quebrada Cañabravita, 21.III.2012, (N. Tórres): 2 ♂ apterous, 1 ♀ apterous (UPTC-In-10848). Orito, Aguas abajo B5 SE, 21.X.2010, (N. Tórres): 1 ♂ apterous (UPTC-In-10850). Orito, Quebrada Cañabravita NE PB5, Gaia, 21.III.2012, (N. Tórres): 1 ♀ apterous (UPTC-In-10851). **Vaupés:** Mitú,

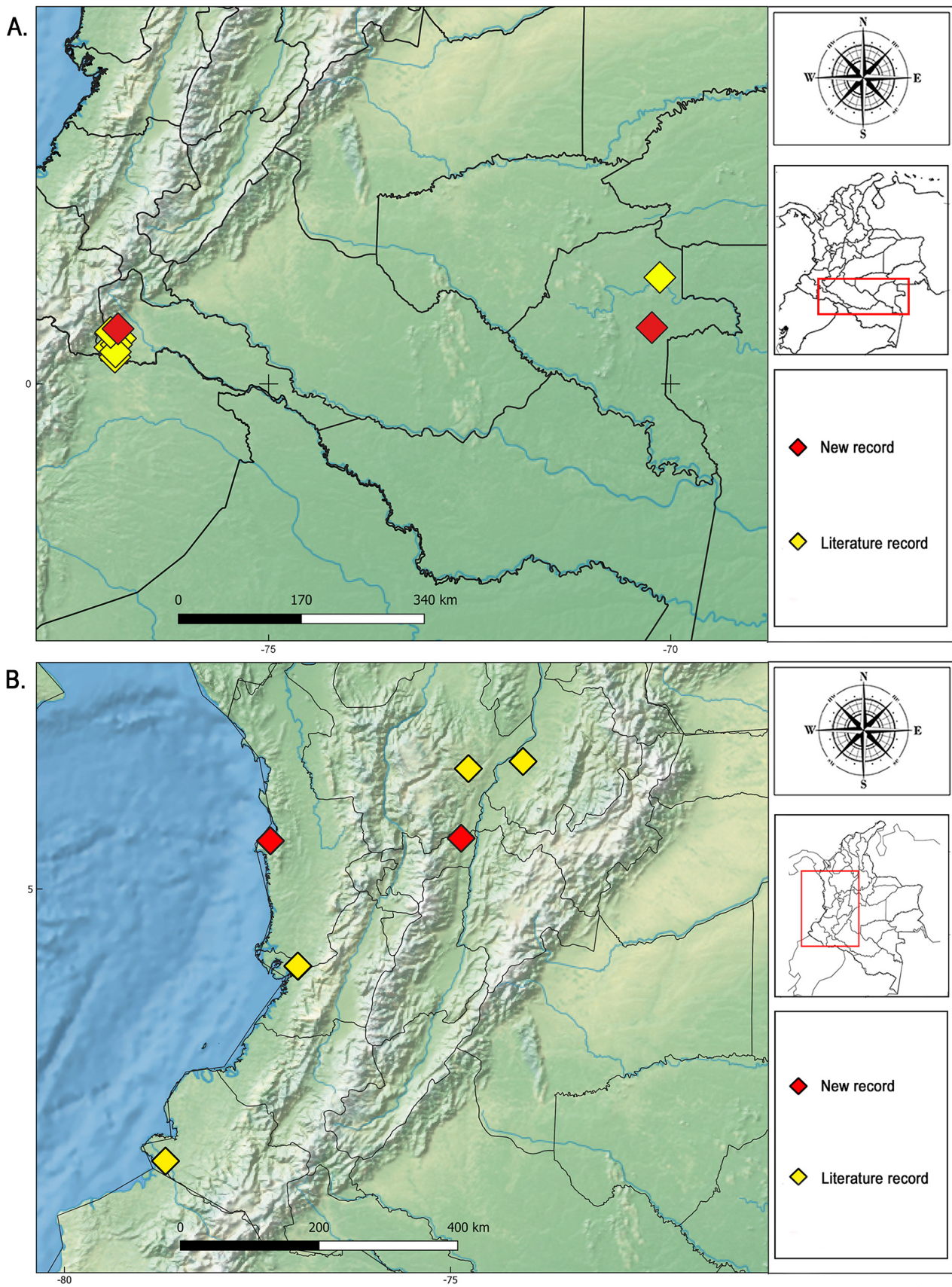


FIGURE 11. Geographic distributions in Colombia of **A.** *Rhagovelia williamsi*; **B.** *Rhagovelia zeteki*.

Comunidad indígena Acaricuara, 23.VIII.2008, (R. Pedroza): 16 ♂ apterous, 5 ♀ apterous (UPTC-In-10846). Mitú, Comunidad indígena Acaricuara, Caño Paca, 16.XI.2008, (R. Pedroza): 9 ♂ apterous (UPTC-In-10847). Mitú, Comunidad indígena Acaricuara, 23.VIII.2008, (R. Pedroza): 2 ♂ apterous, 2 ♀ apterous (UPTC-In-10849).

***Rhagovalia zeteki* Drake, 1953**

(Fig. 11B, 14D)

Rhagovalia zeteki Drake, 1953: 145.

Diagnosis. Body length: apterous male (~3.1), apterous female (~3.1), macropterous male (~3.2), macropterous female (~3.2). General color uniformly reddish-brown to black, with a small dark-yellow spot on anterior portion of pronotum. Pronotum of apterous form completely covering mesonotum. Apterous male hind trochanter with at most a single small spine. Apterous male hind femur with a single row of small spines basally and 2 regular, parallel rows of spines on apical half. Apterous male hind tibia with small pegs throughout length and a straight apical spur. Posterolateral margins of male abdominal segment VII surrounding genital cavity without black denticles. Male paramere as in Polhemus (1997: 185, fig. 132). Apterous female abdomen without median carina. Macropterous female pronotum without elevated posterior projection.

Distribution. COLOMBIA: **Antioquia** (this work), **Caldas** (this work), **Chocó** (this work), **Valle del Cauca** (Polhemus 1997, this work) (Fig. 11B). PANAMA (Drake 1953).

Material examined. **Antioquia:** Maceo, Vereda San Antonia, Finca El Horizonte. Quebrada, 1000 m, 6°33'31.82" N, 74°46'05.23" W, 21.III.2018, (F. Muñoz): 1 ♂ apterous, 1 ♀ apterous (CLUA035 / CEMUA230). **Caldas:** Norcasia, Río Manso, quebrada 1, 07.X.2016, (C. Llano): 1 ♂ apterous (UPTC-In-05616). **Chocó:** Nuquí, Boca-Vieja, Bejuquillal, Coquí, Sitio 1, 22 m, 5°37'25" N, 77°19'58" W, 19.X.2017, (I. Morales & F. Molano): 1 ♀ apterous (UPTC-In-05623). **Valle del Cauca:** Bajo Calima, Centro Bajo Calima, U. del Tolima, 12.XII.2017, (C. Llano): 1 ♂ apterous (CEBUC).

Rhagovalia incertae sedis

***Rhagovalia gaigei* Drake & Hussey, 1957**

(Fig. 12, 14E)

Rhagovalia gaigei Drake & Hussey, 1957: 5

Rhagovalia victoria Padilla-Gil 2012: 61. **Syn. nov.**

Remarks. So far, *R. gaigei* was known only from the type series and the material examined by Polhemus (1997). Possibly due to this reason, this species was not used for comparison when *R. victoria* was described by Padilla-Gil (2012). Examination of topotypical and type material of both species showed that *R. victoria* is a junior synonym of *R. gaigei*. Padilla-Gil (2012) included *R. victoria* in the *robusta* group because most of its characters agreed with this group, although it did not fit into it entirely, especially regarding the paramere shape. *Rhagovalia victoria* possesses all diagnostic features of *R. gaigei*, including the paramere (Padilla-Gil 2012: fig. 14), which has essentially the same shape as that of *R. gaigei* figured in Polhemus (1997: 365, fig. 389). Additionally, in both species, the male hind trochanter has several small spines, the hind femur displays a basal row of minute spines and two parallel rows of spines on apical 3/5 decreasing in size distally, the hind tibia bears small spines throughout its length and a straight apical spur, and the posterolateral margins of male abdominal segment VII surrounding the genital cavity lack black denticles. Finally, *R. victoria* was described from the same Colombian region where the types of *R. gaigei* were collected (Sierra Nevada de Santa Marta, Magdalena).

Distribution. COLOMBIA: **Cesar** (this work), **Magdalena** (Drake & Hussey 1957, Polhemus 1997, this work) (Fig. 12A).

Type material examined. Holotype apterous ♂ of *R. gaigei* (NMNH): 'Colombia, Santa Marta, Sierra Nevada de Santa Marta, Mt. San Lorenzo, 1525 m, 09-VI-1920, F.M. Gaige'. Holotype apterous ♂ of *R. victoria* (ICN): 'Colombia, Departamento Magdalena, Santa Marta, Corregimiento Minca, Hacienda La Victoria, 11°7'22.2" N,

74°5'29.7" W, 1075 m, 14.X.2007, leg. F. Fernandez'. PARATYPE: same data as holotype, 1 apterous ♂ (ICN).

Additional material examined. Cesar: Valledupar, Chemesquemena, Sierra Nevada de Santa Marta, 1800 m, II.2017, (J. Carvajal): 2 ♀ macropterous, 1 ♀ apterous (UPTC-In-05614). Valledupar, Chemesquemena, Sierra Nevada, 1800 m, I.2017, (J. Carvajal): 1 ♂ apterous (UPTC-In-05616). **Magdalena:** Santa Marta, Sierra Nevada de Santa Marta, Hacienda La Victoria, Jabalí Bajo, 1151 m, 19.IV.2007, (L. Jiménez): 1 ♂ apterous (UPTC-In-05615).

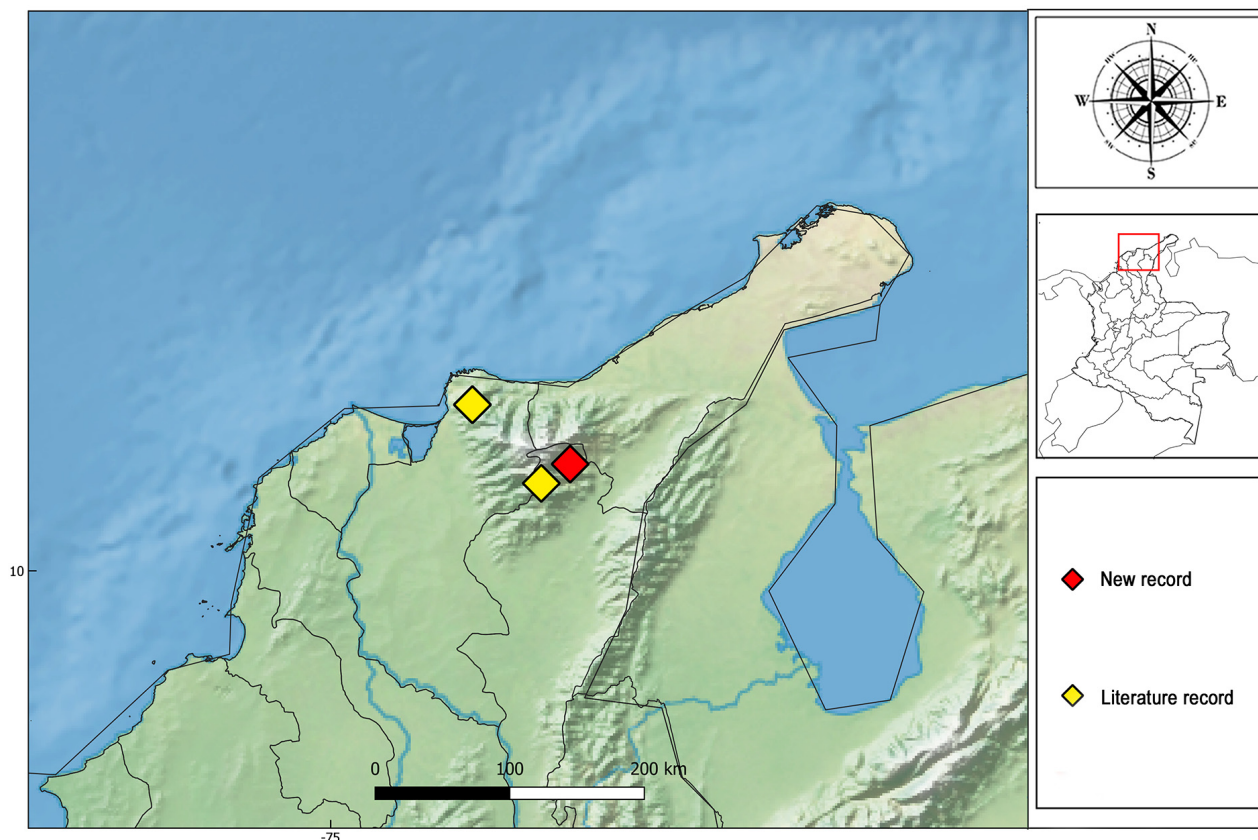


FIGURE 12. Geographic distribution of *Rhagovelia gaigei*.

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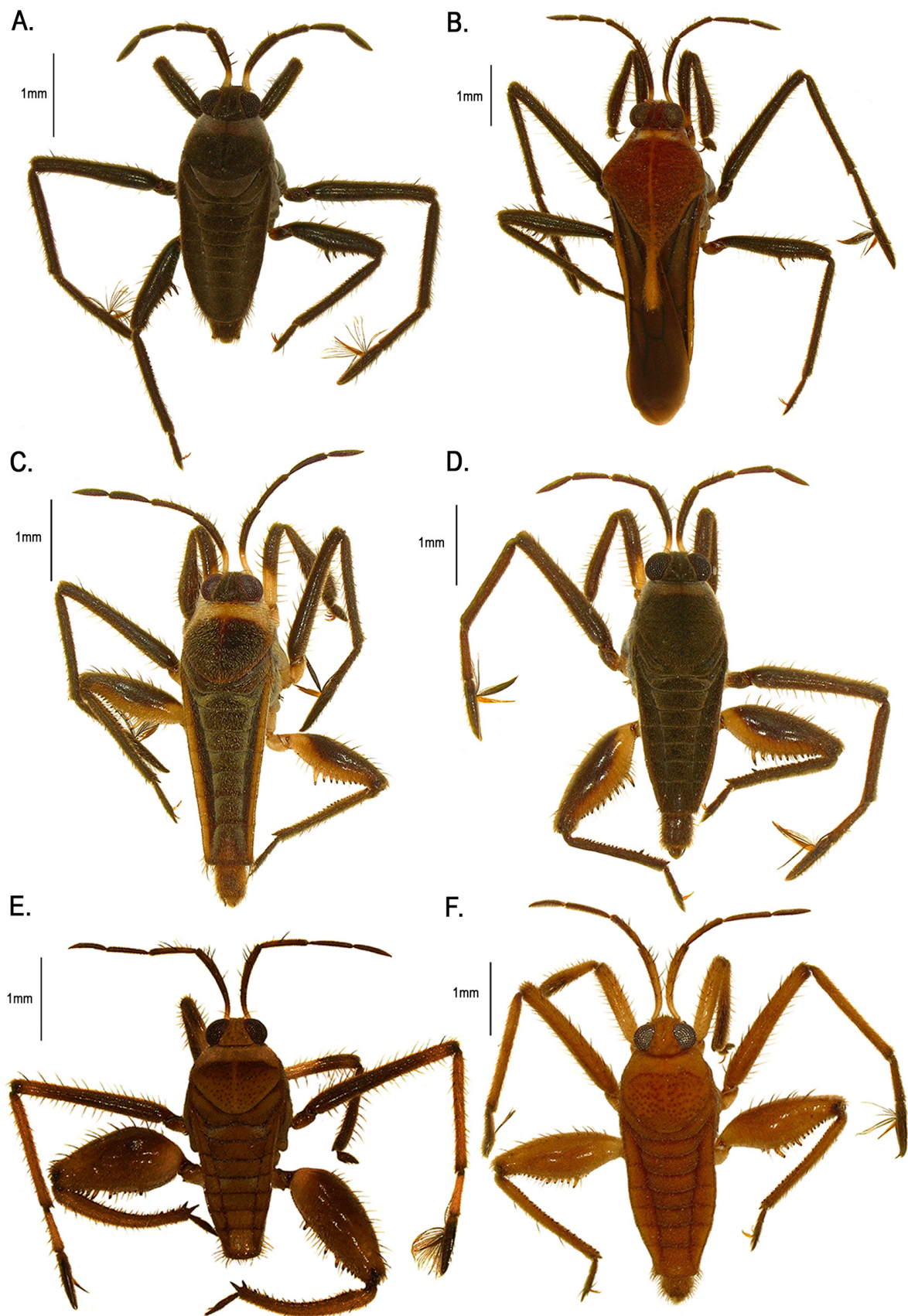


FIGURE 13. Specimens of the genus *Rhagovelia* recorded from Colombia, dorsal view: **A.** *R. cali* (apterous male); **B.** *R. malkini* (macropterous female); **C.** *R. perija* (apterous male); **D.** *R. femoralis* (apterous male); **E.** *R. castanea* (apterous male); **F.** *R. sinuata* (apterous male).

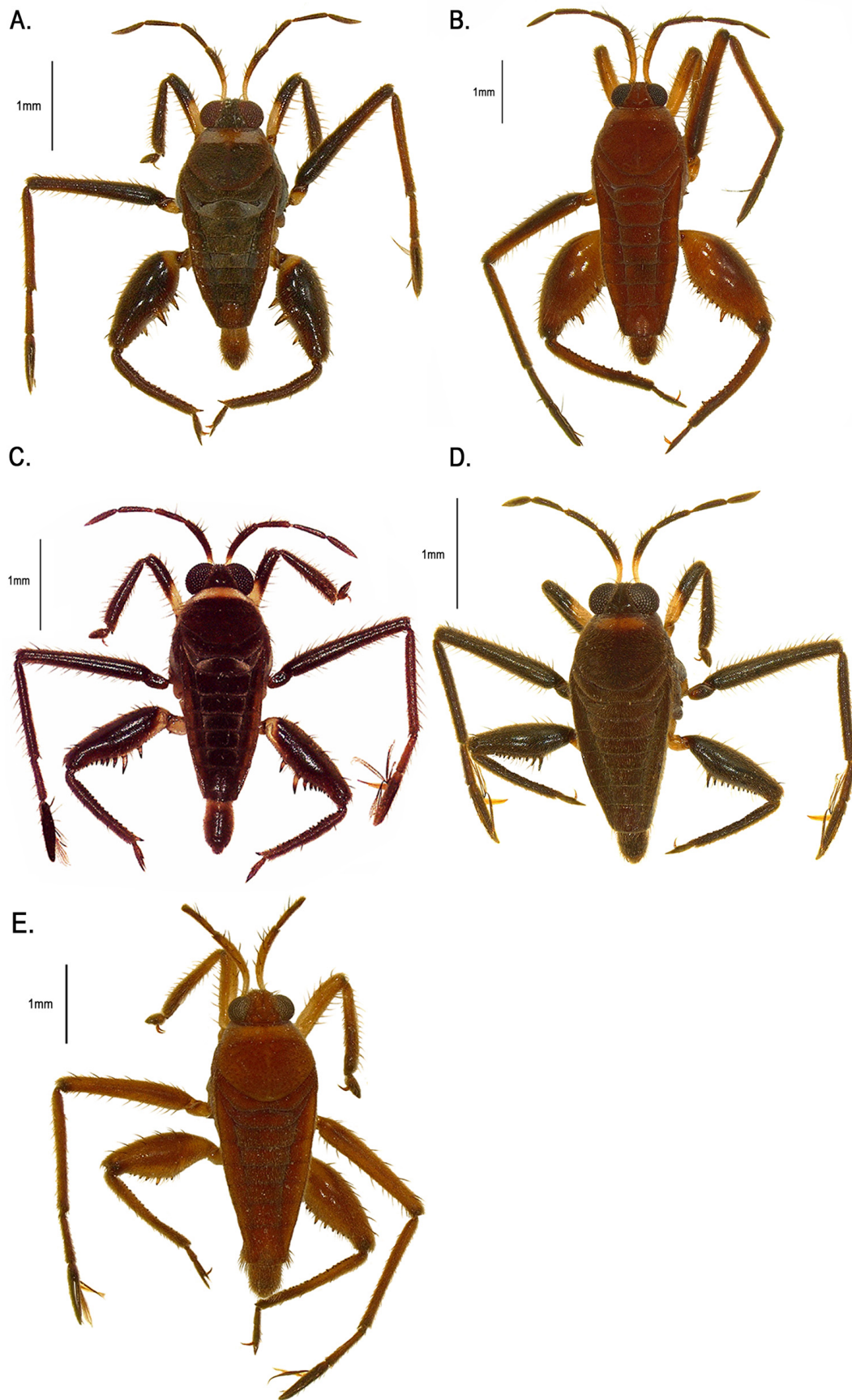


FIGURE 14. Specimens of the genus *Rhagovelia* recorded from Colombia, dorsal view: **A.** *R. trailii* (apterous male); **B.** *R. venezuelana* (apterous male); **C.** *R. williamsi* (apterous male); **D.** *R. zeteki* (apterous male); **E.** *R. gaigei* (apterous male).

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