Aquatic and semiaquatic bugs (Insecta, Hemiptera, Heteroptera) from Toluviejo Municipality, Sucre Department, Caribbean region of Colombia

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Abstract
We present the results of a survey of the aquatic and semiaquatic bugs (Insecta, Hemiptera, Heteroptera) from the small streams Pechilín, Bobo, Camarón, and Macaján, located in Toluviejo Municipality, Sucre Department, Caribbean region of Colombia. Representatives of 8 families, 20 genera, and 32 species have been collected, of which 11 species are recorded for the first time from Sucre Department, 8 from the Colombian Caribbean region, and 4 from Colombia.

Key words
Aquatic insects; Gerromorpha; Neotropical Region; Nepomorpha; South America.

Introduction
Colombia is located in the tropical zone of South America and is considered one of the megadiverse countries of the world, which together contain 70% of the global biodiversity (Williams et al. 2001). Five geographic regions are recognized in the country: Caribbean, Andean, Pacific, Orinoquía, and Amazonia (IGAC 1996). Sucre Department, located in the Caribbean region, is divided into 5 subregions: La Mojana, Montes de María, Morroquillo, Sabanas, and San Jorge. This department shows a considerable number of ecosystems, including mangroves, swamps, and savannas. Toluviejo Municipality is part of the Montes de María subregion and has different landscapes, such as plains, foothills, hills, and mountains reaching altitudes slightly above 1,000 m.

The Colombian Caribbean region includes remnants of dry tropical forest, one of the least known and most endangered ecosystems in the world (Pizano and García 2014), characterized by a dry season of 3 or more months and deciduous species of plants (Rodríguez-M et al. 2012). This ecosystem is extremely fragmented and is subject to continuous deterioration, mainly due to anthropic activity. Climatic factors such as a very dry season in 2014 and the El Niño phenomenon in 2015–2016 have also had an influence in its loss of integrity. In Sucre Department, many aquatic ecosystems are rapidly deteriorating, which represents a threat to a yet poorly studied fauna.
Over 300 species of aquatic and semiaquatic bugs (Hemiptera, Heteroptera) have been recorded from Colombia, but many areas of the country remain largely unexplored, including Sucre Department, where only 15 genera and 21 species have been reported so far (Aristizábal-García 2017). We present here a survey of the aquatic and semiaquatic bugs from 4 streams located in Tolviejo Municipality, which is an important contribution to our knowledge of the diversity of these insects in the dry tropical forests of Sucre Department and the Colombian Caribbean.
Methods

Specimens were collected below 70 m of altitude in 4 streams: Pechilín, Bobo, Camarón, and Macaján (Fig. 1), located in Toluviejo Municipality, Sucre, Colombia. Climate in the region is typically tropical, with an average temperature of 28 °C. The dry season extends from April to July, and the rainy season goes from August to December (Aguas et al. 2008). Soils in the area are the result of Tertiary orogeny and of Quaternary alluvial deposits, fluvial-marine and fluvial-lacustrine. The mountain landscape of the Toluviejo formation is constituted by alternating black shale, mica bearing shale and limestone (IGAC 1998).

Pechilín Stream runs through the municipalities of Ovejas, Los Palmitos, Colosó, Morroa, Toluviejo, and Tólu. During the dry season, it shows fairly large areas of backwater (pools) and areas of moderate current (Fig. 2), whereas during the rainy season, the current can be dangerously strong, making sampling impossible. Bobo Stream is located in Macaján Village, about 10 km north of Toluviejo (IGAC, 1996). Many areas of this stream are dry for most of the year, but it also includes permanent or temporary pools (Fig. 3). Both streams above are crossed by the Toluviejo–San Onofre road. Camarón and Macaján streams run through the rural area of Macaján Village, about 3 km from the road. Camarón Stream is an extremely deteriorated ecosystem, where only small pools can be found (Fig. 4). Macaján Stream (Fig. 5) is also quite deteriorated because of anthropic activities.

Field work happened between February and June of 2014, between February and October of 2015, and between February and June of 2017. Sampling was carried out between 9 a.m. and 2 p.m., using a Surber net and an entomological net of 25 cm in diameter. Four stations were selected in Pechilín Stream, 6 in Bobo, 2 in Macaján, and 1 in Camarón, and collections were made in 45-minute periods in each of them. Specimens were preserved in 85% ethanol and stored in plastic vials. Numbered labels were added to the plastic vials according to the collector of the material: Claudia Moreno-R. (CMR) or Wendy Molina-J. (WMJ). They have been deposited in the entomological collection of the Institute of Natural Sciences (ICN) of the National University of Colombia, in Bogotá.

Table 1 is based on the number of specimens collected and the number of times each species was found. Abundant species are those that were found 15 or more times, and the total number of individuals found in all samples was larger than 60. Frequent species are those that were found between 5 and 14 times, and the total number of...
individuals was between 10 and 60. Occasional species were found 4 or less times, and the total number of individuals was less than 10.

Results

Representatives of 8 families, 20 genera, and 32 species have been collected, of which 11 species are recorded for the first time from Sucre Department, 8 from the Colombian Caribbean region, and 4 from Colombia. Table 1 summarizes the species found in each stream surveyed and their relative abundancies, as well as the first records from Sucre Department, the Colombian Caribbean region, and Colombia.

Infraorder Gerromorpha
Family Gerridae
Subfamily Charematometrinae
*Brachymetra* Mayr, 1865

**Brachymetra albinervus** (Amyot & Serville, 1843)

Figure 6

<table>
<thead>
<tr>
<th>Species</th>
<th>Bobo Stream</th>
<th>Pechilín Stream</th>
<th>Camarón Stream</th>
<th>Macaján Stream</th>
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<td><strong>Abundant Species</strong></td>
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<tr>
<td><em>Telmatometra ujhelyii</em></td>
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<td><em>Trepobates trepidus</em></td>
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<td><em>Trepobates panamensis</em></td>
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<td><em>Hydrometra caraiba</em></td>
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<td><em>Ragovelia tenipes</em></td>
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<tr>
<td><em>Rheumatobates bergrothii</em></td>
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<td><strong>Frequent Species</strong></td>
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<td><em>Tenagobia incerta</em></td>
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<td><em>Gelastocoris hungerfordi</em></td>
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<td><strong>Occasional Species</strong></td>
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<td><em>Brachymetra albinervus</em></td>
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<td><em>Limnogonus aduncus</em></td>
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<td><em>Gelastocoris flavus flavus</em></td>
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<td><em>Centrocorisa kollar</em></td>
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<td><em>Curicta montei</em></td>
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<td><em>Ranatra parvula</em></td>
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<td><em>Buenoa platycnemis</em></td>
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<td><em>Martarega hondurensis</em></td>
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<td><em>Martarega pacifica</em></td>
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† = First record from Colombia. ‡ = First record from the Colombian Caribbean Region. § = First record from Sucre Department.


Identification. *Brachymetra albinervus* is extremely variable in terms of body size and general coloration, which cannot be reliably used for its recognition. Our specimens were identified based on the following characters: antennomere I shorter than II and III together; eye not surpassing the anterolateral angle of the pronotum; pronotum with apex rounded, not reaching the mesocorax; fore femur robust and slightly arched, with sparse conical black setae ventrally (Fig. 7); and dorsum of acetabula with silvery setae. This combination of characters distinguishes them from all known congeners (Cordeiro 2017).


Subfamily Gerrinae

*Limnogonus* Stål, 1868

**Limnogonus aduncus** Drake & Harris, 1933

*Limnogonus hyalinus* (Fabricius, 1803)


**Identification.** Males examined were easily identified as *L. aduncus* based on the shape of abdominal segment VIII, which has a small, downward curving, apical projection on the ventral surface (Fig. 9). Females are more difficult to identify but could be recognized by the antennomere I longer than the head width including the eyes, dorsal portion of the mesopleura dark with a transversal light stripe in the middle, last abdominal laterotergite clearly projected posteriorly (Fig. 10), and posterior margin of abdominal sternite VII sharply projected in the middle (Nieser 1970).


**Limnogonus hyalinus** (Fabricius, 1803)


**Identification.** Males of *L. hyalinus* were separated from those of *L. aduncus* based on the shape of abdominal segment VIII. Both species display a posterovertral projection, however, the projection is much longer in...
the former, extending at least to the same level of the posterodorsal margin of the same segment. Females of L. hyalinus can be confused with those of L. aduncus at first sight but could be distinguished from these based on the last abdominal laterotergite, which is truncate at apex, not projected beyond the corresponding mediotergite (Nieser 1970).

**Distribution in the Colombian Caribbean region.**
Bolivar (Morales-Castaño and Castro-Vargas 2010), Sucre (this work).

*Tachygerris* Drake, 1957

**Tachygerris opacus** (Champion, 1898)


**Identification.** Females of *T. opacus* were identified by the posterior margin of abdominal sternite VII roundly projected in the middle, surpassing the acute and laterally curved spinose projections of the last abdominal laterotergites. Males were recognized by the following combination of characters: fore femur not widened on basal half, without protuberance or tubercle on posterior surface; prostiger elongated, with distal half subtriangular; and pygophore with 2 small teeth on dorsolateral margin, without large dorsal projection (Mondragón et al. 2017).

**Distribution in the Colombian Caribbean region.**

Subfamily Rhagadotarsinae

*Rheumatobates* Bergroth, 1892

**Rheumatobates bergrothi** Meinert, 1895


**Identification.** Material of the genus *Rheumatobates* was identified based on the males, which in some species have extreme modifications of the antennae and legs. *Rheumatobates bergrothi* is one of these cases, where the antennomere III displays a wide midventral projection and an indentation on the distal half, the hind trochanter bears 2 toothlike projections, and the hind femur has a pedunculated T-shaped structure on the mesal margin (Molano-Rendón et al. 2017a).

**Distribution in the Colombian Caribbean region.**

Subfamily Trepobatinae

*Ovatametra* Kenaga, 1942

**Ovatametra obesa** Kenaga, 1942

**New record.** Colombia: Sucre: Toluviejo: Pechilín Stream, station 2 (09°26′08″ N, 075°26′15″ W), Wendy Molina-J., 15.VIII.2015 (WMJ 052).

**Identification.** The taxonomy of *Ovatametra* is very coarse, because it was never revised and some species are distinguished in the literature based almost entirely on the color pattern, which is quite variable when a large population is sampled. To aid in the identification of our material, we compared it with photos of type or reference material of all described species of the genus. The females examined agree well with *O. obesa*, with body length around 3.0 mm and abdominal mediotergite VII with a tuft of setae near the middle of the posterior margin (Kenaga 1942). The pattern of dark stripes on the mesonotum, however, showed to be variable. Some specimens have the longitudinal dark stripes continuous along the segment and transversely connected on the anterior and posterior margins, whereas others have narrower, interrupted longitudinal stripes that do not connect anteriorly and posteriorly. The same type of variation was
observed by FFFM in large populations from the Brazilian Amazon.

**Distribution in the Colombian Caribbean region.** Sucre
(this work).

*Telmatoctrena* Bergroth, 1908

*Telmatoctrena ujhelyii* Esaki, 1926


**Identification.** Specimens examined have the typical color pattern of *T. ujhelyii*, where there are no longitudinal dark marks on the pronotum, the anterior margin of the mesonotum is black, all longitudinal dark stripes of this segment reach the posterior margin, and the median longitudinal dark stripe is long, reaching the anterior margin in most cases (Molano-Rendón et al. 2017b). They were distinguished from the recently described *T. vallecaucana* Molano-Rendón, Mondragón & Morales-Castaño, 2017 by the absence of a posteroventral keel on the male abdomen and of yellow marks on the female metanotum.

**Distribution in the Colombian Caribbean region.**


*Trepobates* Uhler, 1894

*Trepobates panamensis* Drake & Hottes, 1952

were distinguished by short setae. Females were identified by the abdominal sternite VII not strongly projected posteriorly, with a fringe of short setae on the posterior margin (Aristizábal-García 2002).

**Distribution in the Colombian Caribbean region.** Córdoba (Morales-Castaño and Castro-Vargas 2010), Magdalena (Molano-Rendón et al. 2005), Sucre (Aristizábal-García 2017, this work).

**Trepobates taylori** (Kirkaldy, 1899)

**New record.** Colombia: Sucre: Tolviejo: Pechilín Stream, station 2 (09°26′08″ N, 075°26′15″ W), Wendy Molina-J., 01.IV.2017 (WMJ 077).

**Identification.** Males of *T. taylori* were distinguished from the other 2 species of the genus occurring in the study area by the fore femur with a preapical constriction and the venter of abdominal segment VIII covered only by short setae. Females were identified by the abdominal sternite VII not strongly projected posteriorly, without fringe of setae on the posterior margin (Aristizábal-García 2002).


**Trepobates trepidus** Drake & Harris, 1928


**Identification.** The 3 species of *Trepobates* occurring in Colombia have been collected in the study area. Males were identified as *T. panamensis* when the fore femur had no preapical constriction and the venter of abdominal segment VIII was covered only by short setae. Females were identified by the abdominal sternite VII not strongly projected posteriorly, with a fringe of short setae on the posterior margin (Aristizábal-García 2002).

**Identification.** Males of *T. taylori* were distinguished from the other 2 species of the genus occurring in the study area by the fore femur without preapical constriction and the venter of abdominal segment VIII covered only by short setae. Females were identified by the abdominal sternite VII not strongly projected posteriorly, without fringe of setae on the posterior margin (Aristizábal-García 2002).

**Distribution in the Colombian Caribbean region.** Cesar (Morales-Castaño and Castro-Vargas 2010), Sucre (Aristizábal-García 2017, this work).

**Family Hydrometridae**

**Subfamily Hydrometrinae**

**Hydrometra** Latreille, 1796

**Hydrometra caraiba** Guérin-Méneville, 1857


**Identification.** Males of *H. caraiba* were promptly identified by the abdominal sternite VII with a pair of curved brushes of setae located approximately in the middle of the segment. Females were identified by the combination of body about 18 mm long; clypeus broad, subquadrate, with a blunt median projection; and pro- and mesoacetabula with circular punctures (Moreira and Barbosa 2013).

**Distribution in the Colombian Caribbean region.** Atlántico (Hungerford and Evans 1934), Cesar (Morales-Castaño et al. 2008), Magdalena (Torre-Bueno 1926, Hungerford and Evans 1934), Sucre (this work).

Family Mesoveliidae
Subfamily Madeoveliinae
*Mesoveloidea* Hungerford, 1929

**Mesoveloidea williamsi** Hungerford, 1929

*Figures 11, 12.*

**New record.** Colombia: Sucre: Toluviejo: Pechilín Stream, station 2 (09°26′08″ N, 075°26′15″ W), Wendy Molina-J., 01.IV.2017 (WMJ 078).

**Identification.** Our specimens were identified as *Mesoveloidea* based on the preapical pretarsal claws (Fig. 12) and the fully developed triangular scutellum, which are exclusive to this genus among Neotropical Mesoveliidae. Further identification as *M. williamsi* was based on the shape of the male paramere, which agreed with those drawn by Jaczewski (1931) and Moreira et al. (2006).

**Distribution in the Colombian Caribbean region.** Sucre (this work).

Subfamily Mesoveliinae
*Mesovelia* Mulsant & Rey, 1852

**Mesovelia amoena** Uhler, 1894

*Figure 13*


**Identification.** *Mesovelia amoena* is parthenogenetic in the tropics of America and in Hawaii, where it was introduced (Moreira et al. 2008). Therefore, our material consists solely of females, which could be determined by
the characters: body brown and around 2.0 mm long, and the middle femur without spines on the posterior surface (Moreira et al. 2008).

**Distribution in the Colombian Caribbean region.** Sucre (this work).

*Mesovelia mulsanti* White, 1879


**Identification.** *Microvelia longipes* is probably the most easily identified Neotropical species of the genus. Males have strikingly long hind legs that are much longer than the body. Female hind legs reach at least the apex of the abdomen and are very long compared to other species of *Microvelia* (Nieser and Melo 1997, Padilla-Gil and Moreira 2013a).  

**Distribution in the Colombian Caribbean region.** Sucre (Aristizábal-García 2017), Sucre (this work).

*Microvelia mimula* White, 1879


**Identification.** Our material of this species was identified based on the males, because females can be confused with other species, especially when in the macropterous form. All males of *M. mimula* have the terminalia distinctly modified, with the dorsum of abdominal segment VIII expanded laterally, the venter of this segment widely excavated on the posterior margin, and the proctiger with large lateral projections (Drake and Carvalho 1954).

**Distribution in the Colombian Caribbean region.** Sucre (this work).

*Microvelia panamensis* Champion, 1898


**Identification.** Like the previous species, our material of *M. panamensis* was identified based on the males. In this case, there are no strong modifications of the terminalia, but they could be recognized by the venter of abdominal segment VIII elevated near the posterior margin, with an
apical fringe of anteriorly curving setae, which are more easily seen in lateral view (Polhemus 1977). Males also have minute spines on the hind femur, which were broken in some specimens, and straight hind tibia.

**Distribution in the Colombian Caribbean region.** Cesar (Polhemus 1977), Sucre (this work).

**Microvelia pulchella Westwood, 1834**


**Identification.** Our specimens of *M. pulchella* were identified based on the short pronotum in the apterous form, not covering the mesonotum, posterior lateral margins of male abdominal segment VII without black denticles, and posterior tibia of males and females with a crescent-shaped spur at the apex. Our individuals also display proctiger not prolonged posteriorly into a spine-like process and posterior femur with a single row of spines, which lead to the identification as *R. elegans* (Polhemus 1997).

**Distribution in the Colombian Caribbean region.** Cesar (Aristizábal-García 2017), Sucre (this work).

Subfamily Rhagoveliinae

*Rhagovelia* Mayr, 1865

**Rhagovelia calopa Drake & Harris, 1927**


**Identification.** Specimens examined belong to the *elegans* group sensu Polhemus (1997) based on the pronotum of the apterous form completely covering the mesonotum, posterior lateral margins of male abdominal segment VII without black denticles, and posterior tibia of males and females with a crescent-shaped spur at the apex. Our individuals also display proctiger not prolonged posteriorly into a spine-like process and posterior femur with a single row of spines, which lead to the identification as *R. elegans* (Polhemus 1997).

**Distribution in the Colombian Caribbean region.** Cesar (Aristizábal-García 2017), Sucre (this work).

**Rhagovelia tenuipes Champion, 1898**

**Figures 14, 15**


**Identification.** Like *R. calopa*, the species above belongs to the *angustipes* complex. *Rhagovelia tenuipes* is the most widespread and variable species of the complex, but our material is well within the known variation of the species: abdominal mediatergites V–VIII are shining black centrally; sides of male abdomen are bowed outward; female abdominal laterotergites are not reflexed over the abdomen; hind trochanter is black; male hind femur is long and sinuous, with a longer spine near the
middle followed by a series of shorter spines to the apex (Fig. 16); and male hind tibia has spinules along the length and a straight apical spur (Bacon 1956).

**Distribution in the Colombian Caribbean region.**

Cesar, Cordoba, La Guajira, Magdalena (Aristizábal-García 2017), Sucre (Aristizábal-García 2017, this work), Urabá antioqueño (Aristizábal-García 2017).

Subfamily Veliinae

*Platyvelia* Polhemus & Polhemus, 1993

**Platyvelia brachialis** (Stål, 1860)


**Identification.** Our specimens of *P. brachialis* were identified based on the following combination of characters: posterior margin of male abdominal sternite VI without projections; pronotum not shortened posteriorly, with anterior margin narrower than head width through eyes, and anterolateral angles not projected; and jugum, apex of pleurite VII, and base of VIII with several black denticles. Some of these features are not readily available from the literature but will be published in a forthcoming revision of the genus by FFFM.

**Distribution in the Colombian Caribbean region.**

Sucre (this work).

Infraorder Nepomorpha

**Family Corixidae**

**Subfamily Corixinae**

*Centrocorisa* Lundblad, 1928

**Centrocorisa kollari** (Fieber, 1851)

**New record.** Colombia: Sucre: Tolutiejo: Macaján Stream, station 1 (09°32′4″ N, 75°24′52″ W), Wendy Molina-J., 03.VI.2017 (WMJ 075).

**Identification.** *Centrocorisa* is a small genus of large and broad Corixidae. Its 2 species are characterized by the characters: body more than one-third as broad as long; hypo-ocular suture arising about midway along the ventral margin of the eye; and males without strigil. The female found in Tolutiejo was identified as *C. kollari* based on the presence of a tuft of thin setae on the corium near the nodal furrow, and on a stripe on clavus near the distal third of the claval suture (Nieser 1969).

**Distribution in the Colombian Caribbean region.**

Sucre (this work).

Subfamily Micronectinae

*Tenagobia* Bergroth, 1899

**Tenagobia incerta** Lundblad, 1928


Identification. The genus Tenagobia is easily differentiated from other Corixidae. They are characterized by the antenna three-articulated, the scutellum not covered by the pronotum, and the mesosternum without carina. Species of Tenagobia, otherwise, are hardly identified due to the small size and descriptions largely based on the number of setae in different positions of the body. Our small and yellow to brownish specimens were identified as Tenagobia incerta based on the eyes distinctly less wide than the synthlipsis, the hemelytra with faded reticulate pattern and 3 brown spots along the costal margin, the forefemur with a ventral spur on the basal half, and the palar claw located in a spatulate process (Nieser 1977a).

Distribution in the Colombian Caribbean region. Sucre (this work).

Family Gelas tocoridae
Subfamily Gelas tocorinae
Gelas tocoris Kirkaldy, 1897

Gelas tocoris flavus flavus (Guérin-Méneville, 1835)


Identification. Specimens of Gelas tocoris have cryptical coloration and there is a lot of intraspecific variability, which makes it unsuitable for identification. The secure determination of specimens relies mainly on the structure of the male genitalia, which is more stable within each species. Our material of G. f. flavus was identified based on the following combination of characters: pronotum with lateral margin clearly notched, without longitudinal carinae on the posterior portion; they were distinguished from the former species based on the male genitalia with the tumescence of the right clasper not adnate to the base of the clasper; keel hook shorter, not reaching the base of the pan; and pan shorter and narrower. Besides that, the male genitalia of G. hungerfordi is unique because the fringe of the keel bends towards the hood’s apex at the middle, then is obliquely concave towards the right margin of the apex of the keel, and by the presence of a prominent secondary keel hood (Todd 1955).

Distribution in the Colombian Caribbean region. Córdoba (Melin 1929), La Guajira (Todd 1955), Sucre (this work).

Gelas tocoris major Montandon, 1910


Identification. Our specimens were identified as G. major based on the bilobed pan of the male genitalia (Todd 1955), which is unique in the genus.

Distribution in the Colombian Caribbean region. Magdalena (Todd 1955), Sucre (this work).

Family Nepidae
Subfamily Nepinae
Curicta Stål, 1862

Curicta montei De Carlo, 1961


Identification. Our material of C. montei was identified based on the pronotum without black granulation; posterior half of prosternum not strongly swollen; fore femur longer than the lateral length of pronotum by less than 1 mm, with 1 tooth on each side of the base of the longitudinal sulcus, these teeth located closer to the apex of the femur than to the base; longitudinal sulcus of the fore femur with sulcal teeth, without distinct notch on the distal portion of the lateral margin; and parasternum of the last abdominal segment ending in large, thumblike processes (Keffer 1997).
Distribution in the Colombian Caribbean region. Sucre (this work).

Subfamily Ranatrinae
*Ranatra* Fabricius, 1790

*Ranatra parvula* Kuiter, 1949

**New record.** Colombia: Sucre: Toluviejo: Macaján Stream, station 2 (09°32′05″ N, 075°24′53″ W), Claudia Moreno-R., 11.II.2017 (CMR 116).

**Identification.** Our material of *R. parvula* was identified based on the following combination of characters: interocular space without tubercle; pronotum shorter on midline than fore femur; hind femur reaching the base of the genital operculum; female genital operculum extending less than 0.1 mm beyond apex of abdomen; and respiratory tube longer than body (Nieser 1975).

Distribution in the Colombian Caribbean region. Sucre (this work).

Family Notonectidae
Subfamily Anisopinae
*Buenoa* Kirkaldy, 1904

*Buenoa platycnemis* (Fieber, 1851)


**Identification.** Species of *Buenoa* are identified mainly on features of the males, such as the shape of the rostral prong and the stridulatory structures of foreleg. *Buenoa platycnemis* has a wide distribution and variation of color, which is therefore not useful for its determination. Our material was identified based on the male rostral prong originating laterally on the distal region of the third rostral segment, protruding basally, and distinctly longer than this segment; the tricarinate pronotum; and the fore femur with 11 to 14 stridulatory ridges (Barbosa and Nes-simian 2013).

Distribution in the Colombian Caribbean region. Sucre (this work).

Subfamily Notonectinae
*Martarega* White, 1879

*Martarega hondurensis* Bare, 1932

Figures 17, 18


**Identification.** The main features used to identify species of *Martarega* are found in wings of brachypterous specimens. Our male individuals were identified as *M. hondurensis* based on the narrow median longitudinal hyaline stripe on the hemelytra, hyaline stripe of the hemelytral process continuous (Fig. 17), and proximal third of fore femur with a group of ensiform setae. On the females, the longitudinal stripe of the hemelytra is wide, narrowing on the posterior two-thirds of its length and extending along the costal margin, and the stripe of the hemelytral process is discontinued by an opaque area for one-fourth of its length (Fig. 18) (Barbosa 2014).

Distribution in the Colombian Caribbean region. Sucre (this work).

*Martarega pacifica* Manzano, Nieser & Caicedo, 1995

Figures 19–20


**Identification.** Our material of *Martarega pacifica* was identified based on the following combination of characters: interocular space without tubercle; pronotum shorter on midline than fore femur; hind femur reaching the base of the genital operculum; female genital operculum extending less than 0.1 mm beyond apex of abdomen; and respiratory tube longer than body (Nieser 1975).

Identification. Unlike *M. hondurensis*, males and females of *M. pacifica* do not show sexual dimorphism on the pattern of hemelytral stripes. Our material was determined based on the scutellum with the anterior half opaque and the posterior half hyaline, hyaline stripes of the claval commissure and hemelytral process fused, median longitudinal hyaline stripe wide (Figs. 19–20), hemelytral process shorter than membrane, and male fore- and mesotrochanters without groups of ensiform setae (Barbosa 2014).

Distribution in the Colombian Caribbean region. Sucre (this work).

Discussion

According to Aristizábal-García (2017), 21 species of aquatic and semiaquatic bugs have been recorded from Sucre, to which this survey adds 23, representing a 109.5% increase in our knowledge of the department’s fauna. There is certainly still a lot to be explored in the study area. For example, we collected specimens of the families Hebridae and Belostomatidae, but identification was not possible because the material deteriorated after preservation or was composed solely of immatures and/ or females. In addition, saucer bugs (Naucoridae) have been collected and found to represent undescribed species. These have been sent to a specialist in the group to be published in a separate study.

Three of the most abundant species in the streams surveyed, namely *Telnatometra uyhelvii*, *Trepobates trepidus*, and *Tr. panamensis*, are widely distributed from Mexico or southern United States to Ecuador (Drake and Hotte 1951, 1952, Polhemus and Polhemus 2002, Buzzetti and Cianferoni 2011). They are quite common in Colombia and their occurrences in Sucre Department were already known (Aristizábal-García 2002, 2017). *Hydrometra caraiba* and *Ragovelia tenuipes*, also very abundant in Toluviejo, are even more widespread, ranging from Mexico to Brazil (Moreira et al. 2009, Padilla-Gil and Moreira 2013b). They occur in several departments of the Caribbean region of Colombia (Torre-Bueno 1926, Hungerford and Evans 1934, Morales-Castaño et al. 2008, Aristizábal-García 2017), but the former is herein recorded from Sucre for the first time. The last 2 of the abundant species, *Rheumatobates bergrothi* and *Gelas tocoris major*, are also newly recorded from Sucre. The former is known from Honduras to Colombia (Polhemus and Spangler 1989, Castro-Vargas and Morales-Castaño 2011), and the nearest report is from approximately 200 km, at the Gulf of Urabá (Molano-Rendón et al. 2017a); whereas the latter occurs from Panama to Chile (Todd 1961), and has been previously recorded in the Caribbean region of Colombia only in the Sierra Nevada de Santa Marta, about 240 km from Toluviejo (Todd 1955).

Of the 3 species considered frequent in the study area, *Tenagobia incerta* is herein recorded for the first time from the Caribbean Region of Colombia. This species is widespread from Panama and Trinidad & Tobago to Argentina (Nieser 1977a) and has been recorded from the Colombian departments of Meta and Nariño (Roback and Nieser 1974, Padilla-Gil 2012), but the closest report is actually from Panama, about 430 km away from Toluviejo (Nieser 1977a). *Gelastocoris hungerfordi* is herein recorded for the first time from Sucre Department, but occurs throughout a wide geographic area, from southern United States to northern Brazil (Millsbaugh 1939, Todd 1961). The closest report is from approximately 115 km away in Córdoba Department. The third frequent species, *Ragovelia calopa*, occurs from Mexico to Trinidad & Tobago (Padilla-Gil and Moreira 2013b), and was previously recorded from Sucre Department by Aristizábal-García (2017).

It is among the occasional species that we find the most interesting results from this survey. Species such as *Brachymetra albinervus*, *Limnogonus aduncus*, *Tachygerris opacus*, and *Ragovelia elegans* are very commonly collected in Central and/or South America (Padilla-Gil and Moreira 2013b, Damgaard et al. 2014, Cordeiro 2017), and were previously reported from Sucre Department (Aristizábal-García 2017). On the other hand, 4 of the occasional species are herein recorded for the first time from Colombia: *Microvelia mimula*, *Ovatame trobraesa*, *Curicta montei*, and *Martarega hondurensis*.

*Microvelia mimula* is an extremely common and easily recognized species found in pools and ponds from Cuba to Argentina (Cordeiro and Moreira 2015), and the lack of previous records from Colombia is surely tied to the almost complete absence of studies regarding this genus in the country. *Ovatamebra obesa* is not an uncommon species in northern Brazil (Moreira et al. 2011), and the first record from Colombia is not surprising. As explained in the results above, the taxonomy of this genus is not well resolved, and published records of other species in the country (Padilla-Gil 2016) might be based on misidentifications. *Martarega hondurensis* has records from Belize to Peru, with huge gaps along this area (Barbosa 2014), which we help to fill based on the material collected in Colombia. As for *Curicta montei*, it has scattered records along the northern coast of South America, from Guárico in Venezuela to Pernambuco in Brazil (Keffe 1997). The new record from Colombia presented here extends its distribution about 1,000 km to the west.

Furthermore, 7 first records from the Caribbean region of Colombia are based on the occasional species: *Mesovelia amoenA*, *Mesoveloida williamsi*, *Platyvelia brachialis*, *Centrocorisa kollari*, *Ranatra parvula*, *Buenoa platycnemis*, and *Martarega pacifica*. *Mesovelia amoenA* occurs from Canada to southeastern Brazil and was introduced in the Hawaiian Islands (Damgaard et al. 2012). Despite this wide range, the only published record from Colombia is based on material collected in Antioquia
Department (Alvarez and Roldán-Pérez 1983), around 370 km from Toluviejo. Mesovelioidea williamsi has been recorded from Mexico to southeastern Brazil (Moreira et al. 2006), including a few localities in Colombia (Alvarez and Roldán-Pérez 1983, Morales-Castaño and Molano-Rendón 2008, Padilla-Gil 2013). The published record nearest from Toluviejo, about 430 km to the west, is in Tocumen, Panama (Froeschner 1999).

Platyvelia brachialis is the most common and widespread species of the genus, being found from eastern United States to northern Argentina (Perez-Gelabert and Floriano 2016). The first 2 records from Colombia are very recent, one at Norte de Santander Department, about 375 km away from Toluviejo (Molano-Rendón et al. 2016), and the other from Meta Department, approximately 640 km southeast of our study area (Floriano et al. 2017). Centrocorisa kollari has been collected from Mexico to northern Argentina (Hungerford 1948, Bachmann 1981), but has many gaps in this large area. The closest record in Colombian territory is in Antioquia Department, around 407 km south of Toluviejo (Alvarez and Roldán-Pérez 1983). Ranaterra parvula has been collected only a few times in northern Brazil and in the Colombian department of Meta (Roback and Nieser 1974, Nieser 1975). The new record presented here expands the distribution of the species about 640 km to the northwest.

Buonoa platycnemis is a common species from southern United States to Argentina (Truxal 1953). It has been recorded from the Colombian departments of Cundinamarca, Meta, and Huila (Truxal 1953, Roback and Nieser 1974, Padilla-Gil and Nieser 1992). The nearest record is about 310 km southwest of Toluviejo, at the Dárien Region, Panamá (Truxal 1953). Martarega pacifica is the only species found during our survey that is endemic from Colombia, with published records restricted to Valle del Cauca Department (Manzano et al. 1995, Padilla-Gil 2015), about 650 km southwest of Toluviejo.

Finally, 7 of the occasional species are recorded for the first time from Sucre: Limnogonus hyalinus, Trebomata taylori, Mesovelia mulsanti, Microvelia longipes, Mi. panamensis, Mi. pulchella, and Gelastocoris flavus flavus. These are very common and widely distributed species, and the new records from the department help only in filling gaps, with the exception of Mi. panamensis and G. f. flavus. Microvelia panamensis is known from a few localities in Costa Rica and Panama (Polhemus 1977, Pacheco-Chaves et al. 2014) and has only 2 records from Colombia: one about 230 km from Toluviejo at the Sierra Nevada de Santa Marta in Cesar Department (Polhemus 1977), and the other from an unknown locality in Antioquia Department (Aristizábal-García 2017). Gelastocoris f. flavus occurs all over South America, from Colombia to Uruguay (Nieser 1977b). However, the 2 previous records from Colombia are highly imprecise: Nieser (1977b) recorded the species from the country without further details, and Nieser and Chen (1992) recorded it from “Batal”, an unknown locality in Bolivar Department.

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Authors’ Contributions
CMR and WMJ collected specimens and wrote the manuscript. FFFM and JFB identified specimens and revised the manuscript.

References


