



First record of the nymph of *Caenis cuniana* Froehlich, 1969 (Caenidae: Ephemeroptera) and new distributional records of Caenidae from Colombia

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Abstract. In Colombia have been recorded eight species of the family Caenidae distributed in three states, at the moment do not exist species reported in the Meta state. In this paper, *Caenis cuniana* Froehlich, 1969 (Caenidae: Ephemeroptera) is registered for the first time from Colombia, in the same way, *Brasilocaenis irmleri* Puthz, 1975 and *Caenis chamie* Alba-Tercedor & Mosquera, 1999 expanded your geographical distribution in the Colombian Orinoquia region.

Keywords: Geographical distribution; Neotropics; Orinoquia; Pannota; taxonomy.

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The family Caenidae possesses distribution practically cosmopolitan, except for New Zealand and various oceanic islands (Edmunds Jr *et al.* 1976). The immatures stages presented the thorax with absence hind wing pads, abdominal segment I filament like- gills; operculate gills of abdominal segment II quadrangular, overlapping on median line of body; gills on abdominal segments III-VI fringed with long filaments (Domínguez *et al.* 2006). Nymphs can be found in any type of lentic or lotic environment, generally associated with very fine sediment in areas with slow to moderate water flow (Domínguez & Fernández 2009).

In South America, Caenidae is represented by four genera (*Alloretochus* Sun & McCafferty, 2008; *Brasilocaenis* Puthz 1975; *Caenis* Stephens, 1835 and *Latineosus* Sun & McCafferty, 2008) and 36 species (Salles *et al.* 2024). In Colombia the family is poorly known with eight recorded species, *Alloretochus peruanicus* (Soldán, 1986); *Brasilocaenis amacayacu* Lima, Molineri, Pinheiro & Salles, 2016; *Brasilocaenis atawallpa* Lima, Molineri, Vieira, Pinheiro & Salles, 2019; *Brasilocaenis irmleri* Puthz, 1975; *Brasilocaenis mendesi* Malzacher, 1998; *Caenis chamie* Alba-Tercedor & Mosquera, 1999; *Caenis tarapoto* Molineri, 2009 and *Latineosus colombianus* Soldán, 1986 (Salles *et al.* 2024). In this paper we presented the first record of nymph of *Caenis cuniana* Froehlich, 1969 from Colombia and new distributional records of *B. irmleri* and *C. chamie* from Colombian Orinoco river basin.

Nymphs were collected by using an aquatic entomological net and fixed in 96% ethanol. The pictures were taken with the help of optical microscope OLYMPUS CX31 and stereoscopic LEICA EZ4. The material examined was deposited in the Collection of invertebrates from the laboratory of Ichthyology at Universidad del Quindío (MIUQ), Armenia, Colombia.

Brasilocaenis irmleri Puthz, 1975

Material examined. COLOMBIA. Three nymphs. **META:** Villavicencio, Caño Quenane, SENA-Hachón. 4.067222, -73.500000, 329 m (Figure 1), 19.xi.2014. Col. J. Rojas Peña. **Previous distribution.** Bolivia: states of Santa Cruz and Beni. Brazil: states of Amazonas, Mato Grosso, Rondônia, Roraima and Piauí. Colombia: state of Amazonas. *B. irmleri* was described based on exuvie nymphs, male and female adults collected in Manaus, Brazil (Puthz 1975). This species was registered for the first time in Colombia from Leticia-Amazonas (Domínguez *et al.* 2006) and its record here represent the first in the Orinoco River Basin.

Caenis chamie Alba-Tercedor & Mosquera, 1999

Material examined. COLOMBIA. Ten nymphs. **META:** Villavicencio, Caño Quenane. 4.075856, -73.376244 (Figure 1), 280 m, 26.ii.2015. Col. J. Rojas Peña, LG Salinas Jimenez. **Previous distribution.** Brazil: states of Goiás, Pernambuco, Rondônia, Roraima and Piauí. Colombia: state of Valle del Cauca. *Caenis chamie* was described based on nymphs, male and female adults collected in the Colombian Andean region (Alba-Tercedor & Mosquera 1999). Here, we present the new distributional records of this species from Colombian Orinoquia region.

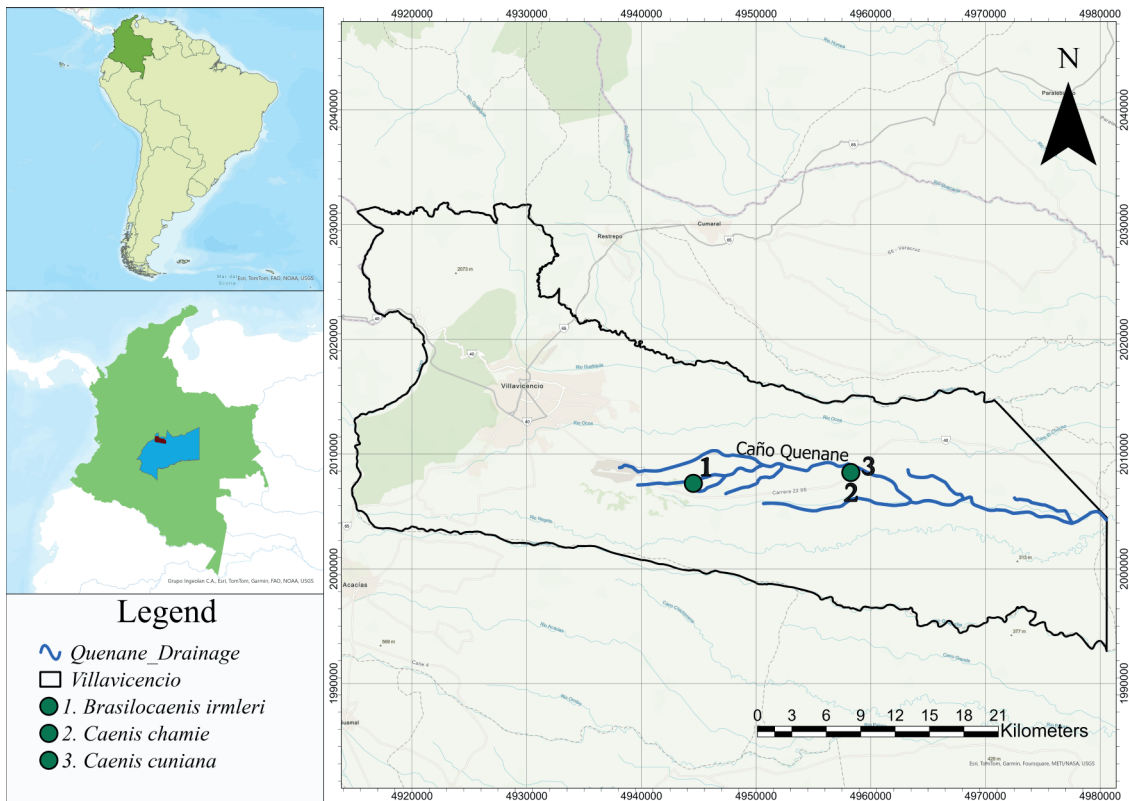


Figure 1. Geographical location of sampling stations of the Quenane river.



Figure 2. *Caenis cuniana*. Dorsal habitus.

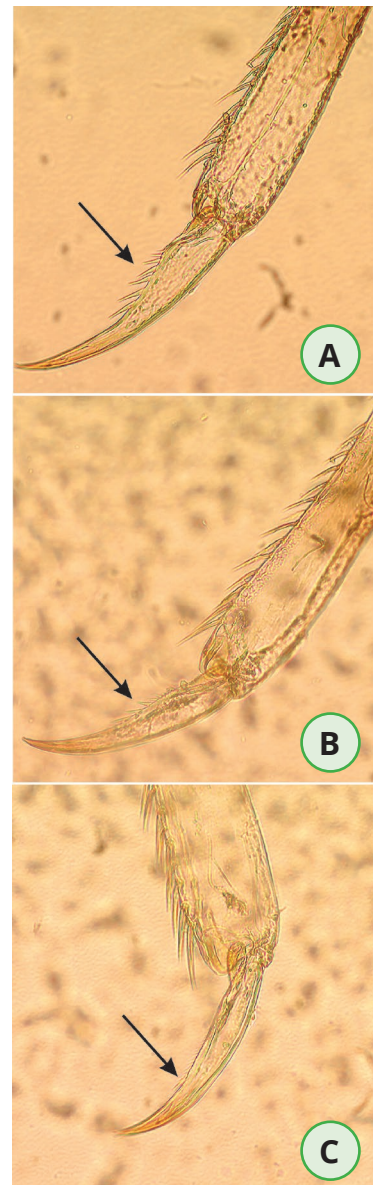


Figure 3. *Caenis cuniana*. A. Fore claw. B. Mid claw. C. Hind claw.

Caenis cuniana Froehlich, 1969 (Figures 2; 3A, 3B, 3C)

Material examined. COLOMBIA Seven nymphs, META: Villavicencio, Caño Quenane. 4.075856, -73.376244 (Figure 1), 280 m, 26.ii.2015. Col. J. Rojas Peña, LG. Salinas Jimenez. **Previous distribution.** Brazil: States of Espírito Santo, Mato Grosso, Pará, Pernambuco, Rio de Janeiro, Roraima and São Paulo. *Caenis cuniana* was first described based on eggs, nymphs, and female adults from Brazil (Froehlich 1969); posteriorly the male adult was described by Silva (1993). We present the first record of this species from Colombia, based on nymphs collected in the Colombian Orinoco River basin. The nymphal stage of this species is characterized by: 1) lateral margins of pronotum almost parallel, a little broader anteriorly (Figures 2-3 in Froehlich 1969 and Figure 76B in Domínguez *et al.* 2006); 3) coxal processes of middle and hind legs narrow and sickle-shaped with margins smooth (Figure 76E in Domínguez *et al.* 2006); 4) tarsal claws of fore and middle legs with denticles which increase in size toward apex (Figures 3A and 3B), those of hind legs with 3-6 small denticles followed by a row of bifid or multifid setules (Figure 3C); and 5) sternum IX rounded (Figures 4 and 5 in Froehlich, 1969).

The Ephemeroptera order in the Colombian Orinoquia region is poorly known with 11 species registered (Zuñiga & Torres-Zambrano 2015; Dias *et al.* 2016; Salinas-Jiménez *et al.* 2017, 2018, 2019; Rojas-Peña *et al.* 2021; Velásquez-Lopes *et al.* 2024). This manuscript is the first record of Caenidae species in the Meta state, expanding Ephemeroptera order geographical distribution in Colombian Orinoquia.

TAXONOMIC AUTHORITIES

Brasilocaenis irmleri Puthz, 1975 [original description] in Puthz (1975); *Caenis chamie* Alba-Tercedor & Mosquera, 1999 in Alba-Tercedor & Mosquera (1999); *Caenis cuniana* Froehlich, 1969 in Froehlich (1969).

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AUTHORS CONTRIBUTION

LGSJ: Conceptualization; LGSJ, LRCL, JIRP: Methodology, Writing, original draft, Visualization, Investigation; LGSJ, LRCL, JIRP: Writing – review & editing; CIC: Funding acquisition; LRCL: Supervision. All authors actively participated in the discussion of the results; they reviewed and approved the final version of the paper.

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

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