

First record of the nymph of *Nanomis rasmusseni* Chacon, Pescador & Segnini, 2013 (Ephemeroptera: Baetidae) from Colombia

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Abstract. Herein, we present the first record of the nymph of *Nanomis rasmusseni* Chacón, Pescador & Segnini, 2013, from two biogeographic regions in Colombia. This species was originally described for the Venezuelan Andes. Both Colombian and Venezuelan populations occur at high elevations, in streams with similar altitudes. We also found that both populations can be distinguished from each other by the terga II, VII, and IX coloration, in addition to the branching pattern of the abdominal gills.

Key-Words. Arthropoda; Distribution; Neotropical; Taxonomy.

INTRODUCTION

Nanomis Lugo-Ortiz & McCafferty 1999 is a neotropical genus of Baetidae (Ephemeroptera) erected by Lugo-Ortiz & McCafferty (1999) based only on nymphal stages. The imaginal stage of *Nanomis* was subsequently described by Salles & Nieto (2008), based on specimens from Argentina. To date, only two species are known: *N. galera* Lugo-Ortiz & McCafferty 1999 occurring in Argentina, Bolivia, Colombia, Ecuador, and Perú (Domínguez *et al.*, 2006), and *N. rasmusseni* Chacón, Pescador & Segnini, 2013 known only in Venezuela (Chacón *et al.*, 2013). In Colombia, *Nanomis* is widely distributed in the Andean region, occurring in the departments of Antioquia, Caldas, Cauca, Cundinamarca, Quindío, Nariño, Risaralda, Tolima, and Valle del Cauca (Lugo-Ortiz & McCafferty, 1999; Zuñiga *et al.*, 2004; Dias *et al.*, 2009; García-Alzate *et al.*, 2010; Gutierrez & Reinoso, 2010; Forero-Céspedes & Reinoso, 2013; Forero-Céspedes *et al.*, 2014). This work presents the first occurrences of *N. rasmusseni* from Colombia and reviews the geographical distribution of this species in South America.

MATERIALS AND METHODS

Immature stages of *Nanomis* were collected by using an aquatic entomological net and fixed in 96% ethanol. The identifications of the individuals were initially performed through external exam-

ination. Additionally, dissected parts of the specimens studied were observed under microscope and mounted on slides using Euparal as mounting media. Finally, the nymphs were determined taxonomically with the help of the original description of *N. rasmusseni* provided by Chacón *et al.*, 2013.

Photographs were taken by using a stereoscopic Zeiss Stemi 2000c with an Axio Cam ERc 5s camera and edited with the Zen 2 lite and Photoshop CS5 programs. The material examined is deposited in the Entomological Collection of the Biology program at Universidad de Caldas (CEBUC) in Manizales, Colombia, and Collection of invertebrates from the laboratory of Ichthyology at Universidad del Quindío (IUQ) in Armenia, Colombia.

RESULTS AND DISCUSSION

Nanomis rasmusseni Chacón, Pescador & Segnini, 2013

Material examined: COLOMBIA: Nariño: Altaquer, Nambi River – bridge on the road between Pasto and Tumaco, 01°16'00.08"N, 78°07'59.92"W, 1324 m.a.s.l., 03.ix.2007, three male nymphs and two female nymphs deposited in CEBUC. Quindío: Calarcá: Vereda Quebrada Negra, Alto Cauca, Quindío River basin, Santo Domingo River, 04°30'36.5"N, 75°36'48.2"W, 1750 m.a.s.l., 12.vii.2009, two male nymphs and three female nymphs deposited in IUC.

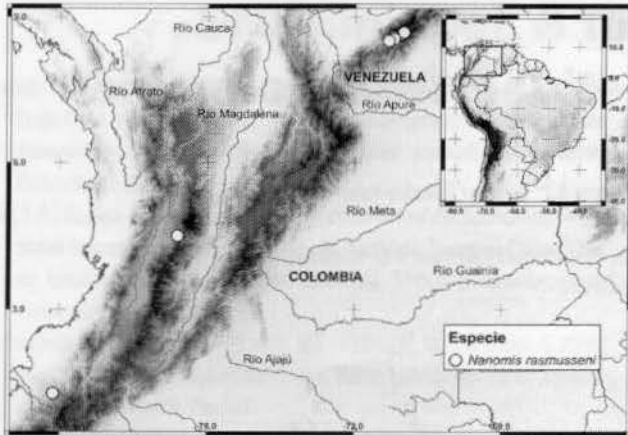


Figure 1. Geographic distribution of *Nanomis rasmusseni* in South America.

Distribution: Venezuela, Central Andes and central and southern Colombia (Fig. 1).

Populations of *N. rasmusseni* in Venezuela and Colombia are found in freshwater environments at high elevations. In Venezuela, *N. rasmusseni* is known from two groups of streams: (1) One group located at altitudes ranging from 1700 to 3000 m.a.s.l., (2) and the second between 830 and 1650 m.a.s.l. (Chacón *et al.*, 2013).

In Colombia nymphs of this species were found in creeks of two departments located in two different biogeographic areas. The first group was found in the Santo Domingo River in Alto Rio Cauca, located in the Andean region (1700 m.a.s.l.). The second was recorded in the Nambi River, located in the Chocó biogeographic region (1324 m.a.s.l.).

Similar diagnostic characters were found in nymphs analyzed in Colombia and Venezuela: (1) Anterior margin of labrum with flattened triangular-shaped (like witch nails) setae arising medially (Fig. 2A); (2) inner set of incisors of right mandible with five denticles (Figs. 2B, D); (3) right prosthema bifid from the basal third (Figs. 2B, C); (4) posterior margin of abdominal terga I-VIII smooth, of terga IX-X with spines (Figs. 3A, B).

We found morphological differences between color patterns of terga in male nymphs from Colombia and Venezuela. Specimens from Venezuela have a central region of terga uniformly whitish and tinged with brown at the anterior and posterior margins of terga (Fig. 15 from Chacón *et al.*, 2013), the lateral area of specimens from Colombia have a pattern extensively tinged with brown, but with different patterns of spots in between which central and lateral lighter areas are observed (Fig. 3A). Tergum VII of the Venezuelan nymphs has a broadly whitish mark with marginal areas tinged with brown,

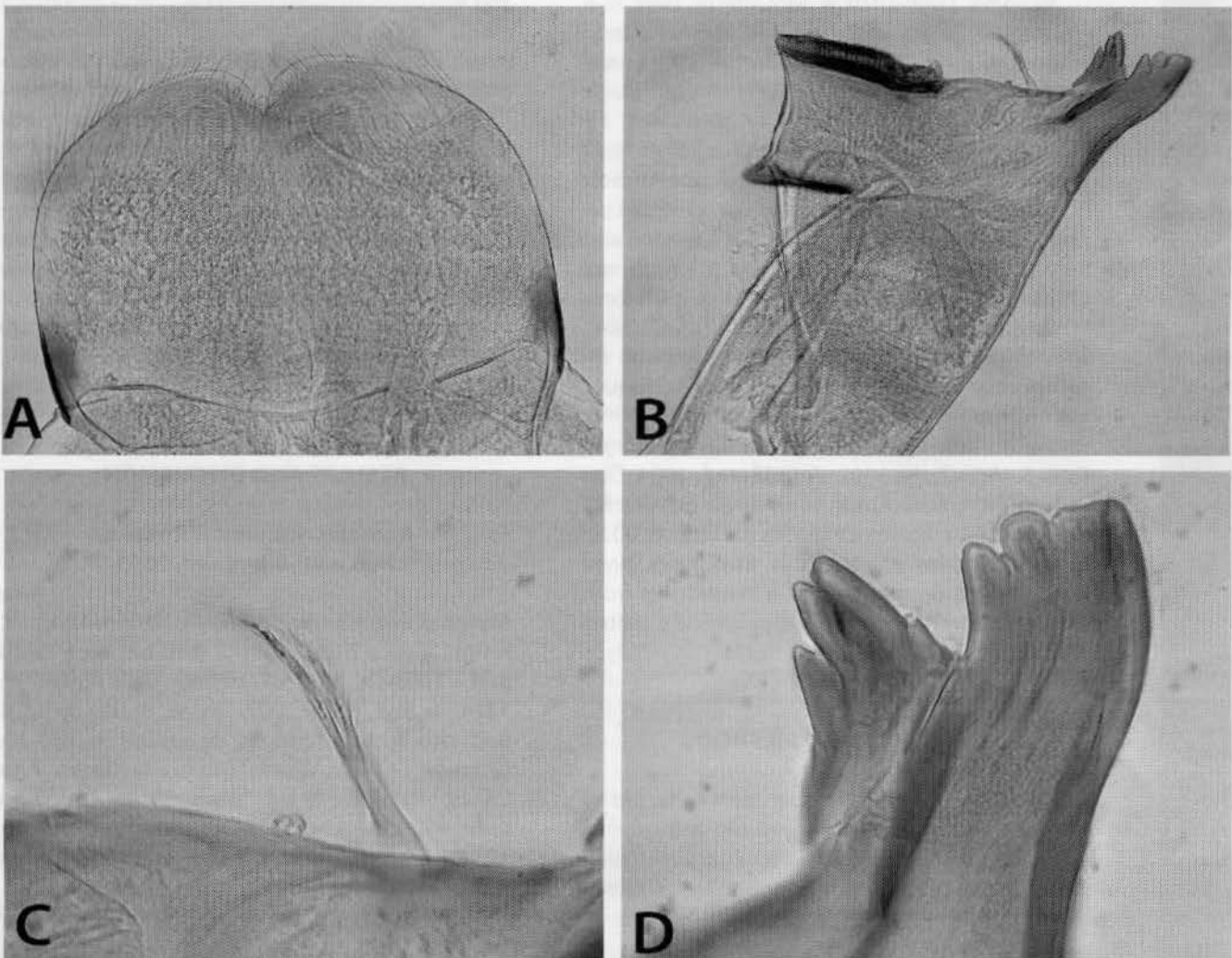


Figure 2. *Nanomis rasmusseni*, nymph. Mouthparts: (A) Labrum; (B) Right mandible; (C) Prosthema; (D) Inner set of incisors of right mandible (left).

while the tergum VII in Colombian nymphs are extensively tinged with brown; terga IX is uniformly tinged with brown in Venezuelan specimens and broadly whitish in the Colombian specimens (Fig. 2A). There are differences in branching gills between the populations from Colombia and Venezuela. In Venezuela, individuals have gills with slightly pigmented ramifications and brown shadow in the center, while in Colombia, individuals have gills more pigmented and completely clear ramifications.

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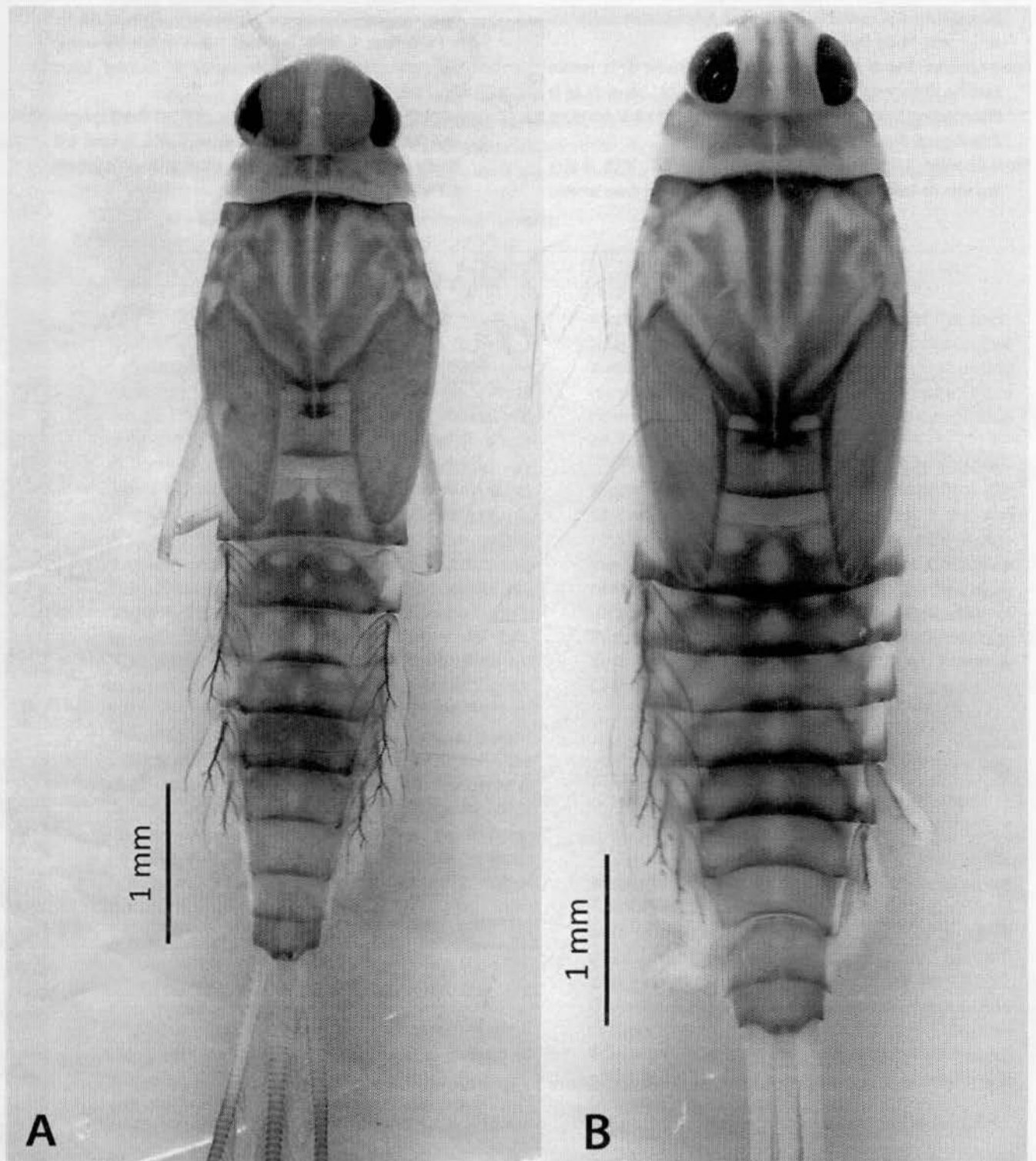


Figure 3. *Nanomis rasmusseni*, nymph. Dorsal habitus of (A) Male and (B) Female.

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