

## The adult stages of *Nanomis* and *Spiritiops* (Ephemeroptera: Baetidae)

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### Los estados adultos de *Nanomis* y *Spiritiops* (Ephemeroptera: Baetidae)

■ **RESUMEN.** Los estados adultos de *Nanomis* Lugo-Ortiz & McCafferty y *Spiritiops* Lugo-Ortiz & McCafferty se describen por primera vez sobre la base de material criado de Argentina y Brasil respectivamente. Se distinguen de los restantes adultos de Baetidae por la siguiente combinación de caracteres: *Nanomis*, alas posteriores con tres venas longitudinales, la segunda bifurcada; proyección costal de las alas posteriores aguda, ubicada basalmente en el margen anterior del ala; fórceps trisegmentados, tercer segmento redondeado. *Spiritiops*, alas anteriores con venas marginales intercalares pares; alas posteriores con 3 venas longitudinales completas y una vena longitudinal corta e incompleta; proyección costal de las alas posteriores aguda apicalmente y con base ancha, ubicada en el tercio basal del margen anterior; fórceps trisegmentados, segundo segmento con una constricción y tercer segmento alargado y angosto.

**PALABRAS CLAVE.** Descripción. Taxonomía. Región Neotropical.

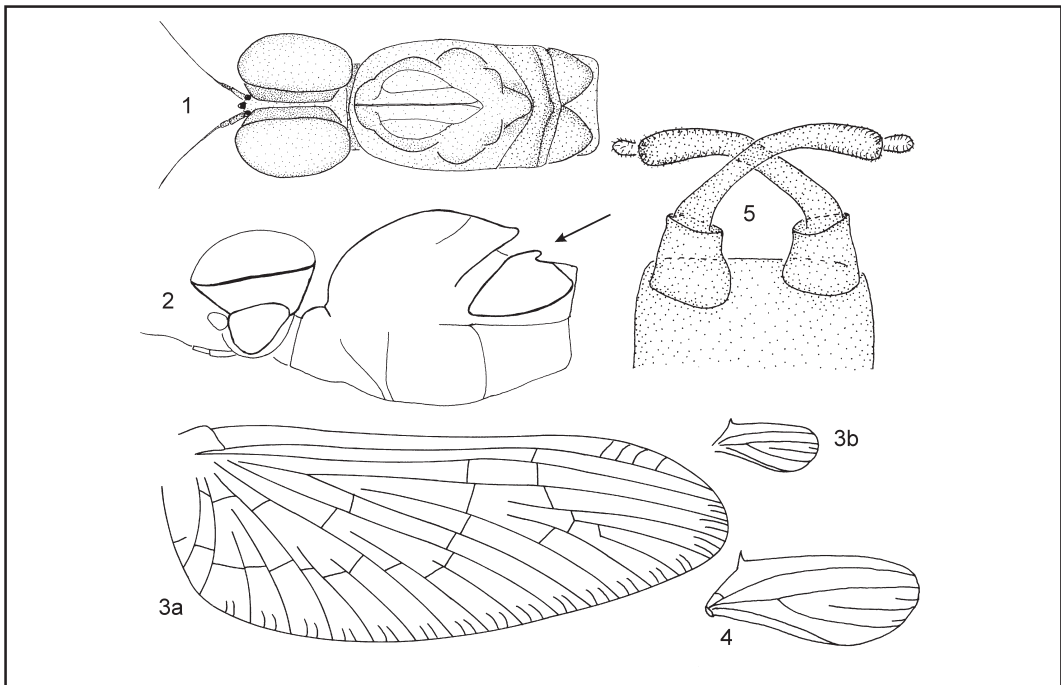
■ **ABSTRACT.** The adult stages of *Nanomis* Lugo-Ortiz & McCafferty and *Spiritiops* Lugo-Ortiz & McCafferty are described for the first time based on reared material from Argentina and Brazil, respectively. They can be differentiated from the other adults of Baetidae by the following characters: *Nanomis*, hind wings with three longitudinal veins, second vein bifurcate; costal projection of the hind wings pointed, placed in the basal third of anterior margin; and forceps three-segmented, third segment rounded. *Spiritiops*, fore wings with paired and long marginal intercalary veins; hind wings with three complete longitudinal veins, and an incomplete small longitudinal vein; costal projection of hind wings pointed, broad at base and placed in the basal third of anterior margin; forceps three-segmented, second segment constricted and third segment elongate and narrowed.

**KEY WORDS.** Description. Taxonomy. Neotropical Region.

### INTRODUCTION

*Nanomis* Lugo-Ortiz & McCafferty and *Spiritiops* Lugo-Ortiz & McCafferty, as several other genera of South American Baetidae (Ephemeroptera), are known only

at the immature stage. There is a single species described for each one of them: *N. galera* Lugo-Ortiz & McCafferty, widely distributed from Colombia and Ecuador to Argentina (Lugo-Ortiz & McCafferty, 1999); and *S. silvudus* Lugo-Ortiz & McCafferty,



Figs. 1-5. *Nanomis galera*, male imago. 1, Dorsal view of head and thorax; 2, lateral view of head and thorax; 3, wings (a, fore wing; b, hind wing); 4, hind wing (enlarged); 5, Genitalia, ventral view.

known from central and northern Brazil and French Guiana (Lugo-Ortiz & McCafferty, 1998; Salles *et al.*, 2004). The nymph described as *Centroptilum* sp. by Demoulin (1966), clearly belongs to *Spiritiops*, and therefore the genus is also reported from Surinam.

In the present paper the adult stages of both genera are described for the first time, based on reared material from Argentina and Brazil. Material deposition is as follows: Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA), Universidade Federal do Espírito Santo, São Mateus, Brazil (UFES), Instituto-Fundación Miguel Lillo, Tucúman, Argentina (IFML).

## RESULTS

*Nanomis* Lugo-Ortiz & McCafferty, 1999 (Figs. 1-5)

*Nanomis* Lugo-Ortiz & McCafferty, 1999: 100; Domínguez *et al.*, 2006: 165.

Male imago. Turbinate eyes oval dorsally, height of stalk half the length of eye width (Figs. 1, 2). Fore wings with paired marginal intercalary veins (Fig. 3a). Hind wings with three longitudinal veins, second vein bifurcate, costal projection pointed, basally narrow and placed in the basal third of anterior margin, 2-3 marginal veins (Figs. 3b, 4). Metascutellum with a small posteriorly directed projection (Fig. 2). Forceps three-segmented, segment I about as long as wide, third segment ovate and rounded (Fig. 5).

*Nanomis galera* Lugo-Ortiz & McCafferty, 1999

*Nanomis galera* Lugo-Ortiz & McCafferty, 1999: 100; Domínguez *et al.*, 2006: 167.

**Male imago.** Length: body, 5.5-5.7 mm. Fore wings, 7.8-7.9 mm; hind wings, 1.4-1.5 mm. General coloration reddish brown. Head yellowish brown. Antennae yellowish brown. Turbinate eyes, dorsal portion pale brownish, ventral portion blackish. Thorax: pronotum

reddish brown, meso- and metanota yellowish brown. Legs pale yellow. Leg I: tibia 1.5 times the length of femur, tarsi 1.3 times the length of femur and with four segments decreasing in length apically. Legs II and III: tibia subequal in length to the femur, tarsi half the length of femur. Wings hyaline except the costal and subcostal area translucent. Abdomen, terga reddish brown, sterna whitish. Cerci pale yellow.

**Female imago.** Length: body, 7.2-7.3 mm. Fore wings, 9.2-9.3 mm; hind wings, 1.8-1.9 mm. General coloration yellowish brown. Head pale yellow. Thorax yellowish brown. Legs yellow. Abdomen, terga reddish brown, sterna pale yellow. Cerci pale yellow.

**Material examined.** 2 male imagos (reared), 1 female imago, 20 nymphs: **ARGENTINA. Tucumán:** río Medina, S 26°32'27", W 65°01'45", 860 m, 14/ vi/ 2001, Molineri, Manzo, Orce y Nieto cols.; 2 male imagos and 1 female subimago (reared) and 22 male imagos: 1 male imago (reared): Raco, R.P. 341 (km 19), A° Palangana, S 26°39'59", W 65°24'49", 28/ xii/ 2000, Molineri col.; 1 female and 1 male subimagos (reared): Escaba, río Singuil, 5/ viii/ 1999, Molineri col.; 1 male subimago (reared): **Salta:** Campo Quijano, 1600 m, 30/ i/ 1996, Molineri col.; 1 male subimago (reared): P.N. El Rey, A° Los Puestos, S 24°47'48", W 64°37'19", 24/ iii/ 1999, Molineri & Romero cols. Material housed at IFML except: 1 male imago (reared): Depto. Trancas, La Toma, río Vipos, 27/ iv/ 1997, Molineri col., housed at UFES.

**Discussion.** Adults of *Nanomis* can be distinguished from the other genera of South American Baetidae by the following combination of characters: 1) hind wings with three longitudinal veins, second vein bifurcate; 2) costal projection of the hind wings pointed placed in the basal third of anterior margin; 3) forceps three-segmented, third segment ovate and rounded.

*Nanomis* would key out in Domínguez *et al.* (2006) as *Andesiops* Lugo-Ortiz & McCafferty, but can be distinguished from this

genus by the shape of the third segment of the forceps (ovate rounded in *Nanomis*, narrow elongate in *Andesiops*).

***Spiritiops*** Lugo-Ortiz & McCafferty, 1998 (Figs. 6-10)

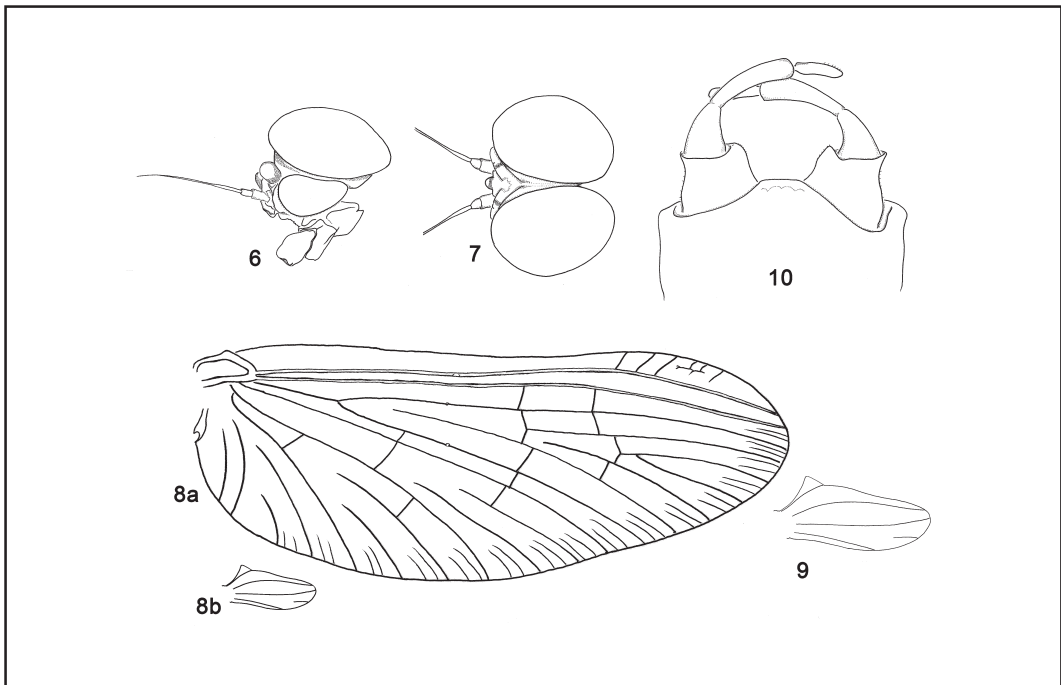
*Spiritiops* Lugo-Ortiz & McCafferty, 1998: 64; Orth *et al.*, 2000: 36; Domínguez *et al.*, 2006: 177.

**Male imago.** Turbinate eyes oval dorsally, almost contiguous along posterior half (Fig. 7); height of stalk less than half of eye width (Fig. 6). Fore wings with paired marginal intercalary veins, these veins longer than respective space between main longitudinal veins (Fig. 8a). Hind wings with three complete longitudinal veins, and a single marginal vein; costal projection broadly pointed, basally broad and placed in the basal third of anterior margin (Figs. 8b, 9). Metascutellum with a small projection. Forceps three-segmented, segment I 1.5 times wider than long, second segment basally constricted, giving the impression of two segments, third segment elongate and narrow (Fig. 10).

***Spiritiops silvudus*** Lugo-Ortiz & McCafferty, 1998

*Spiritiops silvudus* Lugo-Ortiz & McCafferty, 1998: 66; Salles *et al.*, 2004: 6; Domínguez *et al.*, 2006: 177.

**Male imago.** Length: body, 5.2-5.6 mm. Fore wings, 5.0-5.2 mm; hind wings, 0.8 mm. General coloration yellowish white tinged with green (after a short period in alcohol the specimens lose their greenish coloration). Head yellowish white with greenish marks as in Fig. 6. Antennae hyaline to whitish, slightly washed with yellow. Dorsal portion of turbinate eyes orange, apical half of stalk grayish (Fig. 6). Thorax: pro and mesonotum yellowish white, metanotum whitish grey; pro, meso and metasterna whitish. Legs hyaline to whitish, slightly washed with yellow. Leg I: tibia 1.3 times the length of femur, tarsi 1.3 times the length of femur and



Figs. 6-10. *Spiritiops silvudus*, male imago. 6, Dorsal view of head; 7, lateral view of head; 8, wings (a, fore wing; b, hind wing); 9, hind wing (enlarged); 10, Genitalia, ventral view.

with four segments decreasing in length apically. Legs II: tibia 1.5 times the length of femur, tarsi the length of femur. Legs III: tibia 1.4 times the length of femur, tarsi the length of femur. Wings hyaline except for apical half of costal and subcostal area translucent. Abdomen: terga 1 to 7 hyaline, 8 to 10 whitish; anterior half of terga 1 to 8 tinged with green. Sterna and cerci whitish.

**Female subimago.** Length: body, 6.3 mm. Fore wings, 6.0 mm; hind wings, 0.8 mm. General coloration yellowish white tinged with green. Head yellowish white with greenish marks. Thorax yellowish white. Legs hyaline to whitish. Abdomen yellowish white with greenish marks as in male imago. Cerci whitish.

**Material examined.** 2 male imagos, 5 male subimagos, 1 female subimago (reared): **BRAZIL: Amazonas**, Manaus, Igarapé da Onça, Rodovia AM 240, Km 20, x/ 2004, Salles col. (one male imago and two male

subimagos housed at UFES, the remaining at INPA).

**Discussion.** Adults of *Spiritiops* can be distinguished from the other genera of South American Baetidae by the following combination of characters: 1) fore wings with paired long marginal intercalary veins; 2) hind wings with three complete longitudinal veins, and a single marginal vein; 3) costal projection of the hind wings broadly pointed, broad at base and placed in the basal third of anterior margin; 4) forceps three-segmented, second segment basally constricted and third segment elongate and narrow.

*Spiritiops* would key out in Domínguez *et al.* (2006) as *Fallceon* Waltz & McCafferty, but can be distinguished from this genus by the shape of the costal process of the hind wing (hooked in most species of *Fallceon*, erect in *Spiritiops*), and by the length of the marginal intercalary veins (long in *Spiritiops* and short in *Fallceon*).

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