

## Two new species of *Lipuometriocnemus* Sæther from Brazil (Diptera: Chironomidae, Orthoclaadiinae)

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Submetido em 03/06/2015

Aceito para publicação em 07/10/2015

### Resumo

**Dois novas espécies de *Lipuometriocnemus* Sæther do Brasil (Diptera: Chironomidae, Orthoclaadiinae).** *Lipuometriocnemus amazonicus* n. sp. de Manaus (Amazonas) e *L. biancae* n. sp. de Urubici (Santa Catarina) são descritos e ilustrados com base nos machos. *Lipuometriocnemus amazonicus* n. sp. pode ser separado das demais espécies de *Lipuometriocnemus* pela ausência de cerdas em  $R_1$  e  $R_{4+5}$ ; volsela inferior comparativamente longa e não pronunciada; dorsocentrais em número comparativamente reduzido, em sua maioria unisseriais; e baixa razão antenal. *Lipuometriocnemus biancae* n. sp. pode ser separado por apresentar cerdas em  $R_1$  e  $R_{4+5}$ ; uma volsela inferior distinta e arredondada; e dorsocentrais de bi- a trisseriais. Emendas à descrição do gênero e chave para machos de todas as espécies conhecidas são fornecidas.

**Palavras-chave:** Amazônia; Descrições; Mata Atlântica; Região Neotropical; Taxonomia

### Abstract

*Lipuometriocnemus amazonicus* n. sp. from Manaus in the Amazon and *L. biancae* n. sp. from Urubici in Santa Catarina State are described and illustrated as males. *Lipuometriocnemus amazonicus* n. sp. can be separated from other described *Lipuometriocnemus* species because it lacks setae on the  $R_1$  and  $R_{4+5}$ ; has a comparatively long, low inferior volsella; comparatively few, mostly uniserial dorsocentrals; and a low AR. *Lipuometriocnemus biancae* n. sp. differs because it has setae on both  $R_1$  and  $R_{4+5}$ ; a distinct, rounded inferior volsella; and bi- to triserial dorsocentrals. The generic description is emended and a key to the males of all known species is provided.

**Key words:** Amazon; Atlantic Forest; Descriptions; Neotropical region; Taxonomy

## Introduction

The genus *Lipurometriocnemus* Sæther was erected by Sæther (1981) based on *L. glabalis* Sæther from St. Vincent and St. Lucia in the British West Indies. Later, Sæther (1982) described *L. vixlobatus* Sæther from North Carolina and Georgia, U.S.A.; this species has also been recorded from the Yukon Territory, Canada (CRANSTON; OLIVER, 1988). The genus is similar to *Bryophaenocladus* Thienemann and *Metriocnemus* van der Wulp, but differs from both by the absence of an anal point and from the latter by the absence of setae on the wing membrane.

During fieldwork in Brazil, two new species of *Lipurometriocnemus* were collected, *L. amazonicus* n. sp. from the Amazon rain forest and *L. biancae* n. sp. from the Atlantic Forest in southern Brazil. Both species are described and illustrated below based on male adults.

## Material and Methods

The specimens examined were collected in light traps or Malaise traps and preserved in alcohol. They were later mounted in Canada Balsam following the procedure outlined by Sæther (1969). The general morphology follows Sæther (1980).

The holotypes will be deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, Brazil. Paratypes will be kept in the Department of Natural History (ZMBN), Bergen University Museum, University of Bergen, Norway, and at MZUSP.

## Results

### *Lipurometriocnemus* Sæther

*Lipurometriocnemus* Sæther, 1981: 13.

*Lipurometriocnemus* Sæther (1982); Cranston et al. (1989); Mendes and Pinho (2011).

**Type species:** *Lipurometriocnemus glabalis* Sæther, 1981.

**Additional species:** *L. amazonicus* n. sp., *L. biancae* n. sp. and *L. vixlobatus* Sæther, 1982.

The genus was described by Sæther (1981). A few emendations were given in Sæther (1982), and Ferrington Jr and Sæther (1995) added that *L. vixlobatus* has a palpal projection. With the inclusion of the two new species from Brazil, the description has to be further emended.

### Emended description

Small to medium-sized species, with wing length 1.0–2.1 mm.

**Antenna.** Male antenna with 13 flagellomeres, plumose, groove beginning at flagellomere 3 or 4; sensilla chaetica on flagellomeres 2, 3 and 13; without strong apical seta. Antennal ratio 1.2–1.8.

**Head.** Eye bare, without or with short wedge-shaped dorsomedial extension. Temporal setae in single row, consisting of inner and outer verticals, postorbitals generally few or absent. Palp with 5 segments, normal. Apex of palpomere 3 with 2–8 sensilla clavata, sometimes with finger-like extension.

**Thorax.** Anteprepronotum well developed, median lobes not narrowed and joined anteriorly at suture, with several lateral anteprepronotals. Acrostichals strong to weak, beginning near anteprepronotum; dorsocentrals generally numerous, uni- to multiserial at least anteriorly; several prealars present, supraalar present or absent. Scutellum with single or double row of scutellars, posterior setae strongest.

**Wing.** Anal lobe well developed. Membrane without setae, with strong microtrichia. Costa slightly to moderately extended;  $R_{2+3}$  running and ending about midway between  $R_1$  and  $R_{4+5}$ ;  $R_{4+5}$  ending distal to end of  $M_{3+4}$ ; FCu far distal to RM;  $Cu_1$  straight; An ending opposite or proximal to FCu. Brachiolum with 1–3 setae, R with setae,  $R_1$  and  $R_{4+5}$  with or without setae. Squama with several setae.

**Legs.** Tibial spurs and comb normal. Mid and hind legs with pseudospurs on tarsomeres 1–3. Sensilla chaetica and pulvilli absent.

**Abdomen.** Tergites with evenly scattered setae in about 4–5 irregular transverse rows.

**Hypopygium.** Anal point absent or represented by more or less pronounced dorsal hump with several setae.

Sternapodeme nearly straight to slightly rounded, oral projections vestigial to weak. Virga vestigial or small, nail-shaped. Gonocoxite with vestigial to distinct, rounded inferior volsella. Gonostylus club-shaped, with short crista dorsalis.

### Key to the males of *Lipurometrioctenus* Sæther

1.  $R_1$  and  $R_{4+5}$  without setae..... 2  
 –  $R_1$  with setae,  $R_{4+5}$  with or without setae..... 3
2. With 25–31 dorsocentrals, mostly bi – to triserial; AR = 1.60–1.75. USA. .... *L. vixlobatus* Sæther  
 – With 9–19 dorsocentrals, mostly uniserial; AR = 1.23–1.45. Brazil. .... *L. amazonicus* n. sp.
3. Without inferior volsella;  $R_1$  with 2 setae,  $R_{4+5}$  without setae. British West Indies. .... *L. glabalis* Sæther  
 – With distinct, rounded inferior volsella;  $R_1$  with 11–18 setae,  $R_{4+5}$  with 8–27 setae. Brazil..... *L. biancae* n. sp.

### *Lipurometrioctenus amazonicus* n. sp.

(Figures 1-6)

#### Type material

Holotype male: BRAZIL, Amazonas State, Manaus, Reserva Adolpho Ducke, Igarapé Barro Branco, 02°55'47"S 59°58'22"W, 5–8 February 2010, light trap, leg. L.C. Pinho & H.F. Mendes (MZUSP). Paratypes: 8 males as holotype (MZUSP, ZMBN).

#### Diagnostic characters

The species differs from other described *Lipurometrioctenus* species because it lacks setae on the  $R_1$  and  $R_{4+5}$ ; has a comparatively long, low inferior volsella; comparatively few, mostly uniserial dorsocentrals; and a low AR.

#### Description

Male (n = 6–9). Total length 2.41–2.90, 2.65 mm. Wing length 1.14–1.40, 1.23 mm. Total length / wing length 2.08–2.30, 2.17. Wing length / length of profemur 2.05–2.22, 2.11.

*Coloration.* Head, thorax and abdomen brown, legs slightly lighter brown.

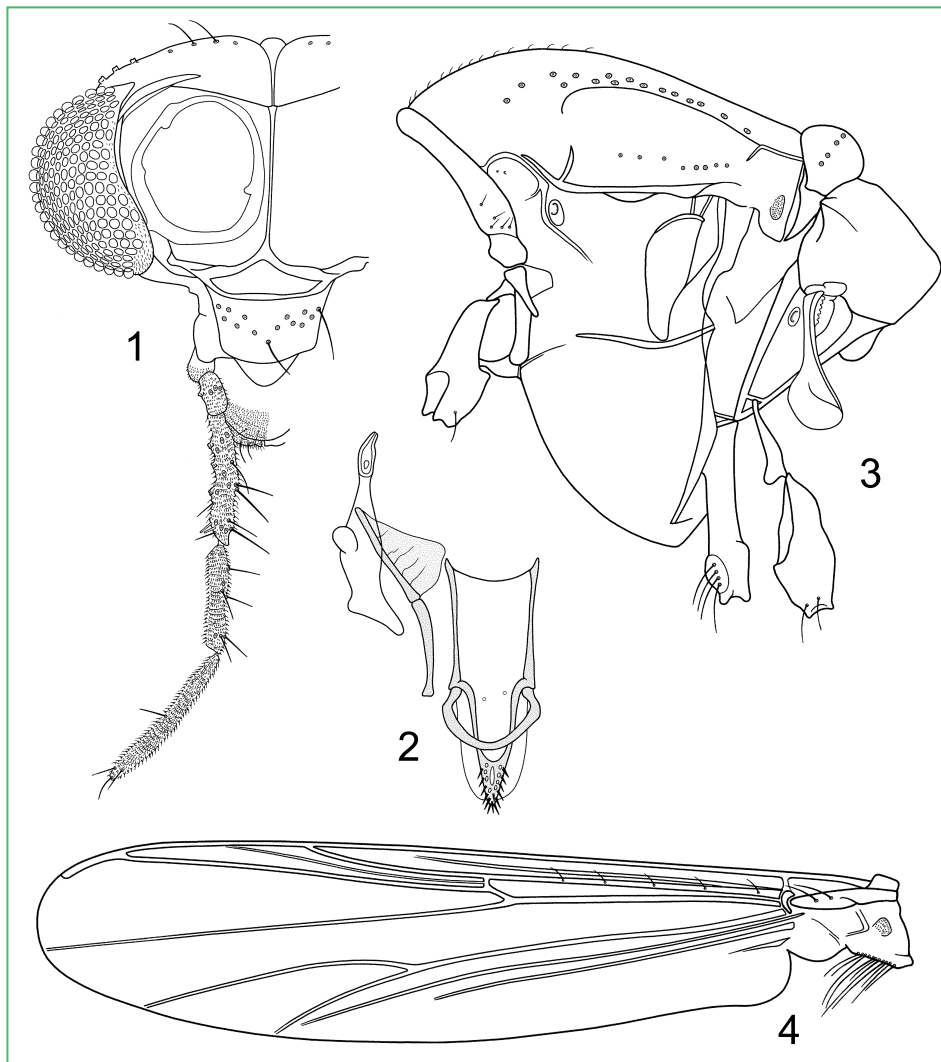
*Antenna.* AR 1.23–1.48, 1.33. Ultimate flagellomere 452–564, 496  $\mu$ m long.

*Head* (Figure 1). Temporal setae 8–10, 9 including 5–7, 5 inner verticals, 2–4, 3 outer verticals and 0–1, 0 postorbitals. Clypeus with 7–14, 9 setae. Tentorium, stipes, and cibarial pump as in Figure 2. Tentorium 109–125, 114  $\mu$ m long; 21–27, 24  $\mu$ m wide. Stipes 107–127, 114  $\mu$ m long; 33–45, 38  $\mu$ m wide. Palp segment lengths (in  $\mu$ m): 23–29, 26; 37–49, 44; 115–131, 124; 86–117, 106; 119–162, 142. Third palpomere with 2–5, 4 sensilla clavata in apical one-half, longest 15–18, 17  $\mu$ m long.

*Thorax* (Figure 3). Antepnotum with 2–6, 4 lateral setae. Acrostichals 12–16, 14; dorsocentrals 9–19, 14, uniserial to partly biserial; prealars 4–8, 6; supraalar absent. Scutellum with 5–8, 7 setae.

*Wing* (Figure 4). VR 1.31–1.41, 1.36. Costal extension 55–94, 72  $\mu$ m long. Brachiolium with 1–3, 2 setae, R with 3–8, 5 setae, remaining veins and cells bare. Squama with 8–12, 10 seta, partly biserial.

*Legs.* Spur of fore tibia 45–54, 49  $\mu$ m long, spurs of mid tibia 30–36, 32  $\mu$ m and 28–33, 30  $\mu$ m long, spurs of hind tibia 47–55, 52  $\mu$ m and 27–29, 28  $\mu$ m long. Width at apex of fore tibia 32–36, 34  $\mu$ m, of mid tibia 32–36, 34  $\mu$ m, of hind tibia 36–41, 39  $\mu$ m. Comb with 8–9, 8 setae, longest 37–41, 39  $\mu$ m long, shortest 22–28, 25  $\mu$ m long. Length (in  $\mu$ m) of pseudospurs of  $ta_1$ – $ta_3$  on mid leg as: 33–39, 36 and 29–32, 28; 30–36, 33 and 28–32, 29; 26–35, 30 and 25–30, 28. Length (in  $\mu$ m) of pseudospurs of  $ta_1$ – $ta_3$  on hind leg as: 33–36, 35 and 30–33, 31; 33–37, 35 and 29–33, 32; 29–35, 33 and 28–32, 30. Lengths and proportions of legs as in Table 1.

FIGURES 1-4: *Lipumetriocnemus amazonicus* n. sp., male: 1, head; 2, tentorium, stipes and cibarial pump; 3, thorax; 4, wing.TABLE 1: Lengths (in  $\mu\text{m}$ ) and proportions of legs of *Lipumetriocnemus amazonicus* n. sp., male (n = 5–6, if not otherwise stated).

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>
p <sub>1</sub>	523–629, 585	588–727, 660	400–531, 487	245–335, 302
p <sub>2</sub>	507–605, 559	498–662, 585	253–343, 317	139–188, 172
p <sub>3</sub>	523–645, 575	605–792, 712	351–458, 417	188–245, 224
	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>	LR
p <sub>1</sub>	155–221, 194	98–123, 114	49–57, 54	0.68–0.76, 0.74
p <sub>2</sub>	98–139, 129	65–82, 77	33–41, 39	0.51–0.58, 0.54
p <sub>3</sub>	147–196, 173	74–106, 87	33–49, 46	0.58–0.60, 0.59
	BV	SV	BR	
p <sub>1</sub>	2.49–2.73, 2.61	2.48–2.78, 2.57	3.5–3.7 (3)	
p <sub>2</sub>	3.37–3.76, 3.50	3.41–3.97, 3.62	3.0–3.6, 3.5	
p <sub>3</sub>	3.16–3.35, 3.23	3.02–3.21, 3.09	4.8–6.0, 5.3	

*Hypopygium* (Figures 5-6). Tergite IX with 14–27, 18 setae. Laterosternite IX with 3–6, 4 setae. Transverse sternapodeme nearly straight with weak oral projections, 63–70, 67  $\mu\text{m}$  long. Phallapodeme 75–83, 79  $\mu\text{m}$  long. Virga small, nail-shaped, 7–10, 8  $\mu\text{m}$  long. Gonocoxite 174–197, 190  $\mu\text{m}$  long; with 49–57, 52  $\mu\text{m}$  long, 8–13, 10  $\mu\text{m}$  wide inferior volsella, ending 55–74, 65  $\mu\text{m}$  from apex of gonocoxite. Gonostylus 94–111, 105  $\mu\text{m}$  long, 23–27, 25  $\mu\text{m}$  wide medially; megaseta 14–17, 15  $\mu\text{m}$  long. HR 1.72–1.90, 1.82. HV 2.21–2.71, 2.52.

Female and immatures. Unknown.

### Distribution and ecology

The species is only known from the type locality, Reserva Adolpho Ducke, a 10,000 ha reserve on the outskirts of Manaus, Amazonas State, Brazil. The specimens were collected in a light trap situated close to a stream and several temporary pools. The area is covered with primary forest and is relatively flat. During

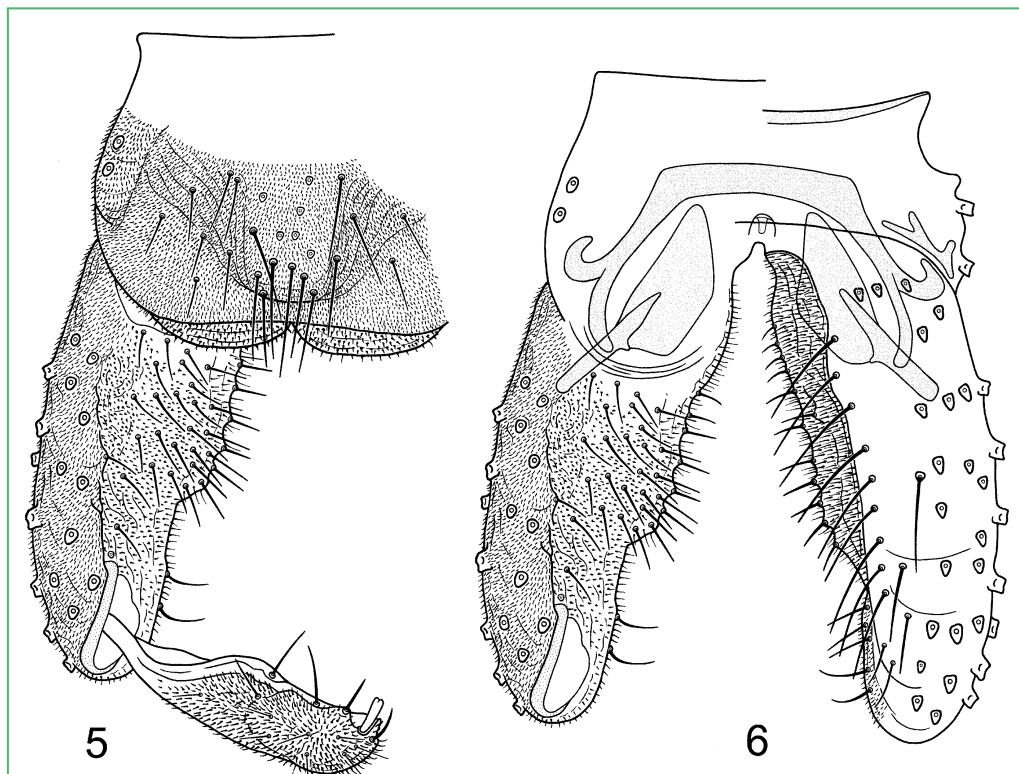
the rainy season numerous small pools form, which are scattered on the forest floor.

Reserva Adolpho Ducke is also the type locality for *Dicrotendipes fittkau* Epler, *Litocladius neusae* Mendes, Andersen *et* Hagenlund, *Beardius curticaudatus* Pinho, Mendes *et* Andersen, *Ablabesmyia communiba* Neubern, *Ablabesmyia ducke* Neubern, *Mariambra mariae* Andersen, Mendes *et* Pinho, *Saetherocryptus amazonicus* Andersen *et* Pinho, *Thalassosmittia amazonica* Andersen *et* Pinho and *Titimbera amazonica* Andersen, Pinho *et* Mendes (EPLER, 1988; MENDES *et* al., 2011; PINHO *et* al., 2013; OLIVEIRA *et* al., 2013; ANDERSEN; PINHO, 2014a; 2014b; ANDERSEN *et* al., 2015a; 2015b).

### Etymology

Named after the Amazon region, where the type specimen was collected.

FIGURES 5-6: *Lipurometrioctenemus amazonicus* n. sp., male: 5, hypopygium, dorsal view; 6, hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.



***Lipuometriocnemus biancae* n. sp.****Description**

(Figures 7-11)

**Type material**

Holotype: male: BRAZIL, Santa Catarina State, Urubici, Morro da Igreja, Parque Nacional de São Joaquim, Rio Pelotas, 1670 m a.s.l., 28°07'37"S 49°28'47"W, 18 September–5 December 2004, Malaise trap, cloud forest, leg. L.C. Pinho & L.E.M. Bizzo (MZUSP). Paratypes: 3 males, as holotype (MZUSP, ZMBN).

**Diagnostic characters**

The species differs from other described *Lipuometriocnemus* species because it has setae on both  $R_1$  and  $R_{4+5}$ ; a distinct, rounded inferior volsella; and bi- to triserial dorsocentrals.

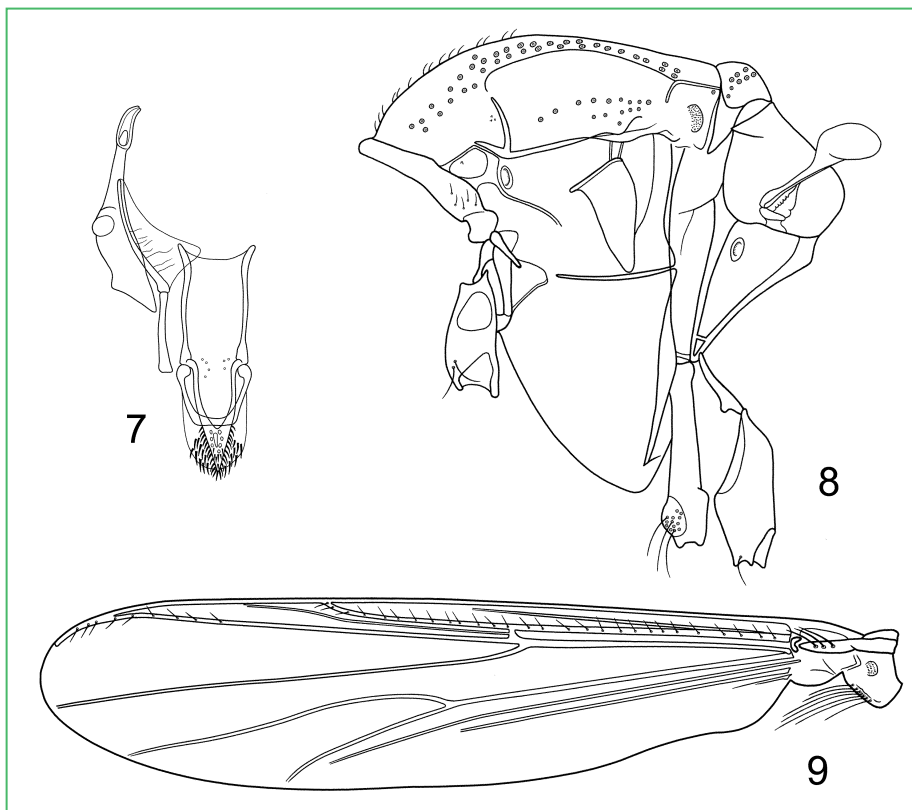
Male (n = 4, if not otherwise stated). Total length 3.17–4.09, 3.63 mm. Wing length 1.96–2.19, 2.11 mm. Total length / wing length 1.45–1.67, 1.59. Wing length / length of profemur 2.14–2.29, 2.23.

*Coloration.* Head and thorax dark brown, abdomen brown, legs slightly lighter brown.

*Antenna.* AR 1.29–1.45 (3). Ultimate flagellomere 572–613 (3)  $\mu\text{m}$  long.

*Head.* Temporal setae 12–14, 13 including 6–7, 7 inner verticals, 4 outer verticals and 2–3, 2 postorbitals. Clypeus with 10–32, 23 setae. Tentorium, stipes, and cibarial pump as in Figure 7. Tentorium 168–185, 175  $\mu\text{m}$  long; 35–43, 39  $\mu\text{m}$  wide. Stipes 170–185, 178  $\mu\text{m}$  long; 45–62, 55  $\mu\text{m}$  wide. Palp segment lengths (in  $\mu\text{m}$ ): 29–41, 34; 51–68, 60; 199–269, 224; 152–205, 173; 213–256, 230. Third palpomere with 4–8, 5 sensilla clavata in apical one-half, longest 17–21, 19  $\mu\text{m}$  long.

FIGURES 7-9: *Lipuometriocnemus biancae* n. sp., male: 7, tentorium, stipes and cibarial pump; 8, thorax; 9, wing.



*Thorax* (Figure 8). Anteprenotum with 3–8, 5 lateral setae. Acrostichals weak, apparently about 10; dorsocentrals 24–36, 31, biserial; prealars 12–13, 13, biserial; supraalar 0–1, 1. Scutellum with 14–20, 17 setae, partly biserial.

*Wing* (Figure 9). VR 1.34–1.36, 1.35. Costal extension 94–117, 104  $\mu\text{m}$  long. Brachiolum with 2–3, 3 setae; R with 15–22, 18 setae; R<sub>1</sub> with 11–18, 14 setae; R<sub>4+5</sub> with 8–27, 17 setae; costal extension with 1–3, 2 non-marginal setae. Squama with 10–14, 12 setae, partly biserial.

*Legs*. Spur of fore tibia 76–92, 82  $\mu\text{m}$  long; spurs of mid tibia 55–68, 61  $\mu\text{m}$  and 36–49, 43  $\mu\text{m}$  long; spurs of hind tibia 88–95, 93  $\mu\text{m}$  and 36–44, 40  $\mu\text{m}$  long. Width at apex of fore tibia 48–58, 52  $\mu\text{m}$ , of mid tibia 48–61, 54  $\mu\text{m}$ , of hind tibia 61–68, 63  $\mu\text{m}$ . Comb with 12 setae, longest 62–73, 69  $\mu\text{m}$  long, shortest 30–33, 32  $\mu\text{m}$  long. Length (in  $\mu\text{m}$ ) of pseudospurs of ta<sub>1</sub>–ta<sub>3</sub> on mid leg as: 46–62, 54 and 43–52, 49; 43–51, 49 and 41–51, 47; 41–49, 47 and 40–44, 43. Length (in  $\mu\text{m}$ ) of pseudospurs of ta<sub>1</sub>–ta<sub>3</sub> on hind leg as: 47–58, 52 and 44–52, 49; 44–57, 50 and 43–51, 47; 44–50, 47 and 40–47, 43. Lengths and proportions of legs as in Table 2.

*Hypopygium* (Figures 10–11). Tergite IX with 24–38, 31 setae. Laterosternite IX with 4–5, 5 setae. Transverse sternapodeme arched with weak oral projections,

94–117, 102  $\mu\text{m}$  long. Phallapodeme 97–109, 103  $\mu\text{m}$  long. Virga nail-shaped, 15–21, 18  $\mu\text{m}$  long. Gonocoxite 221–255, 234  $\mu\text{m}$  long; with 39–44, 42  $\mu\text{m}$  long, 14–21, 18  $\mu\text{m}$  wide inferior volsella, ending 79–94, 89  $\mu\text{m}$  from apex of gonocoxite. Gonostylus 119–126, 123  $\mu\text{m}$  long, 32–39, 35  $\mu\text{m}$  wide medially; megaseta 17–19, 18  $\mu\text{m}$  long. HR 1.80–2.15, 1.91. HV 2.52–2.90, 2.75.

Female and immatures. Unknown.

## Distribution and ecology

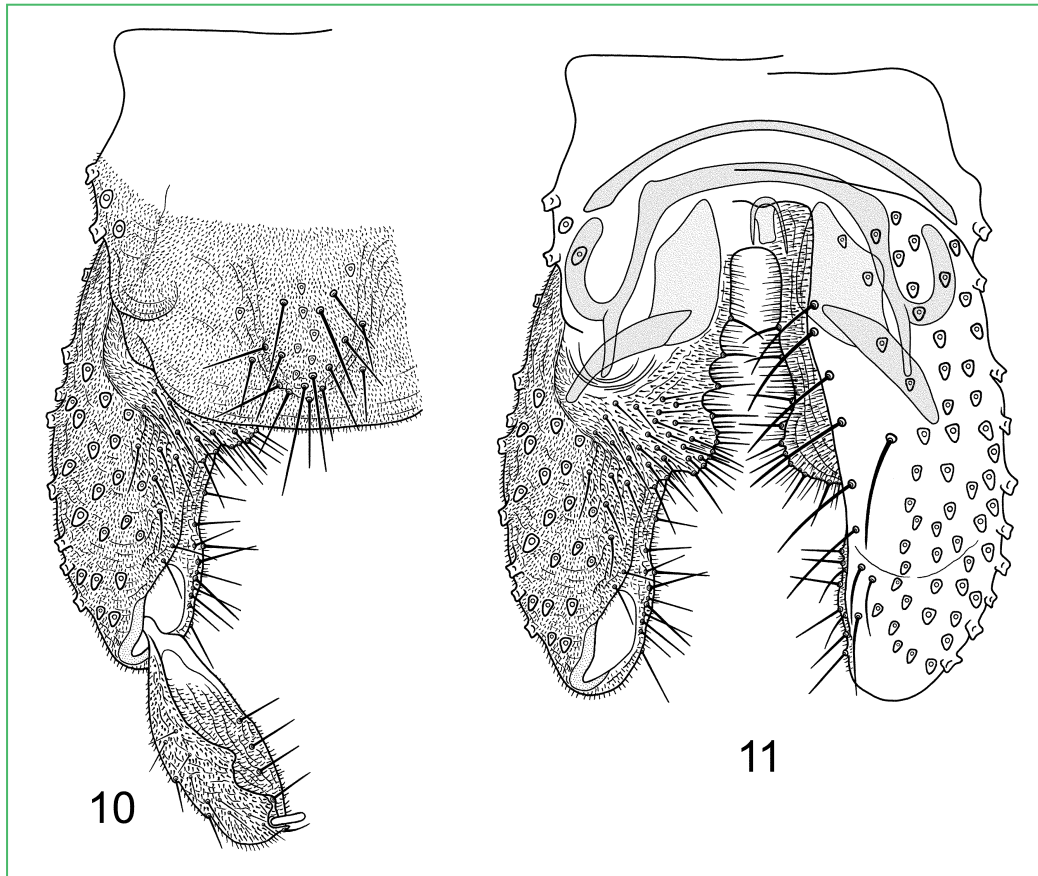
The species is known only from the type locality, Morro da Igreja, in Urubici, Santa Catarina State, southern Brazil. It was collected in a Malaise trap in an area with cloud forest above 1,600 m elevation. The area is part of the Brazilian Pine Forest subregion of the Atlantic Forest (SILVA; CASTELETTI, 2003).

Morro da Igreja is also the type locality for *Pseudosmittia catarinense* Andersen, Sæther *et* Mendes, *Pseudosmittia gibbistyla* Andersen, Sæther *et* Mendes, *Pseudosmittia pinhoi* Andersen, Sæther *et* Mendes, *Saetherocladius urubiciensis* Andersen, Mendes *et* Pinho, *Saetherocladius fusus* Andersen, Mendes *et* Pinho, *Lopescladius vibrissatus* Hagenlund, Andersen *et* Mendes, *Miamberea miae* Andersen *et* Mendes, *Oukuriella pinhoi* Fusari, Roque *et* Hamada, *Xestochironomus virgoferrae* Pinho *et* Souza, *Beardius*

TABLE 2: Lengths (in  $\mu\text{m}$ ) and proportions of legs of *Lipurometrioctenus biancae* n. sp., male (n = 4, if not otherwise stated).

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>
p <sub>1</sub>	874–1062, 960	956–1201, 1066	694–850, 784	376–449, 425
p <sub>2</sub>	801–956, 893	825–1070, 940	417–531, 470	245–294, 268
p <sub>3</sub>	874–1005, 958	1070–1373, 1230	556–694, 639	302–368, 339
	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>	LR
p <sub>1</sub>	253–319, 294	155–201, 184	76–98, 86	0.71–0.77, 0.74
p <sub>2</sub>	180–229, 204	106–147, 127	65–82, 76	0.47–0.53, 0.50
p <sub>3</sub>	229–278, 263	123–163, 145	63–82, 76	0.51–0.55, 0.52
	BV	SV	BR	
p <sub>1</sub>	2.77–2.98, 2.91	2.44–2.66, 2.59	2.9–3.2, 3.1	
p <sub>2</sub>	3.38–3.44, 3.42	3.77–4.15, 3.91	2.9–3.4, 3.0	
p <sub>3</sub>	3.38–3.48, 3.44	3.28–3.51, 3.42	4.2–6.4 (3)	

FIGURES 10-11: *Lipurometricnemus biancae* n. sp., male: 10, hypopygium, dorsal view; 11, hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.



*bizzoi* Pinho, Mendes *et* Andersen, *Beardius mileneae* Pinho, Mendes *et* Andersen and *Beardius nebularius* Pinho, Mendes *et* Andersen (ANDERSEN *et al.*, 2010a; 2010b; HAGENLUND *et al.*, 2010; ANDERSEN; MENDES, 2012; FUSARI *et al.*, 2013; PINHO; SOUZA, 2013; PINHO *et al.*, 2013).

### Etymology

Named after Bianca Cecilie Nygård (University of Bergen) for all support related to fieldtrips to South America.

### Acknowledgements

We are indebted to Dr. Neusa Hamada (Instituto Nacional de Pesquisas da Amazônia, Manaus) for setting

up the project to increase the knowledge about aquatic insects in Amazonas State. Gladys Ramirez made the slide preparations. Financial support for fieldwork in Amazonas was provided through a project supported by PRONEX-CNPq (MCT)-FAPEAM (Insetos aquáticos: biodiversidade, ferramentas ambientais e a popularização da ciência para melhoria da qualidade de vida humana no estado do Amazonas) and INPA (MCT).

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