

Two new species of *Antillocladius* Sæther, 1981 from the Amazon rainforest, Brazil (Diptera, Chironomidae, Orthocladiinae)

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Antillocladius bulbosus sp. n. and *A. spinosus* sp. n. are described and figured based on males collected in a Malaise trap in the Reserva Adolpho Ducke near Manaus in Amazonas, Brazil. *Antillocladius bulbosus* can be separated from its congeners by the distinct anal point with strong basal swelling and bare, nearly parallel-sided apical part, with strong anteriorly directed marginal and ventral setae and an inferior volsella with long, nearly parallel-sided basal part and ovate, setose apical part. *Antillocladius spinosus* has a tapering, pointed anal point with strong posteriorly directed marginal setae, a simple, apically bluntly triangular to subrectangular inferior volsella and the wing lacks apical setae.

Key words: Diptera, Chironomidae, Orthocladiinae, *Antillocladius*, new species, Brazil, Neotropical region.

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Introduction

The genus *Antillocladius* was erected by Sæther (1981) based on *A. antecalvus* Sæther, 1981 from Saint Vincent, British West Indies. Since then 26 species from the Neotropical, Holarctic and Oriental regions have been described or transferred to the genus (Sæther 1982, Wang & Sæther 1993, Andersen & Contreras-Ramos 1999, Mendes *et al.* 2004, Yamamoto 2004, Mendes & Andersen 2008, Mendes *et al.* 2011). The immatures are described for a few species and have been collected in a seep area near a reservoir in Georgia, U.S.A. and in mosses and lichens growing on tree trunks and stones in Brazil (Sæther 1984, Mendes *et al.* 2004, Andersen *et al.* 2013).

So far 16 *Antillocladius* species are listed from Brazil (Mendes & Pinho 2014). Below we describe and figure an additional two species from the Amazon rainforest in Brazil raising the number of species to 18.

Material and methods

The specimens were collected in a Malaise trap and preserved in alcohol. Prior to examination they were dissected, treated with KOH and mounted in Canada balsam following the procedure outlined by Sæther (1969). The general morphology terminology follows Sæther (1980).

The holotypes and some paratypes will be kept in the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP), the remaining paratypes will be housed in the Department of Natural History, University Museum of Bergen (ZMBN).

***Antillocladius bulbosus* sp. n.** (Figures 1, 3–5)

Type material: *Holotype:* ♂, BRAZIL, Amazonas State, Manaus, Reserva Adolpho Ducke, 1 km after entrance, 4–8.II.2010, Malaise trap, leg. L.C. Pinho & H.F. Mendes (MZUSP).



FIGURES 1–2. *Antillocladius* spp. wings. 1. *A. bulbosus* sp. n. 2. *A. simplex* sp. n.

Paratypes: 2 ♂♂ as holotype (MZUSP, ZMBN).

Etymology: From Latin *bulbus*, meaning swelling, referring to the shape of the base of the anal point.

Diagnostic characters: The new species can be separated from its congeners by the distinct anal point with strong basal swelling and bare, nearly parallel-sided apical part, with strong anteriorly directed marginal and ventral setae; the inferior volsella has a long, nearly parallel-sided basal part and ovate, setose apical part; and the wing lacks apical setae.

Description: Male (n = 2–3). Total length 2.06–2.15 mm. Wing length 1.07–1.09 mm. Total length / wing length 1.91–1.98. Wing length / length of profemur 2.54–2.66.

Coloration. Thorax dark brown with light brown stripes, head and abdomen light brown, legs pale brown.

Antenna. Antennal ratio (AR) = 1.01–1.06. Ultimate flagellomere 364–368 μ m long.

Head. Temporal setae 6–10 including 3–4 inner verticals, 2–3 outer verticals and 1–3

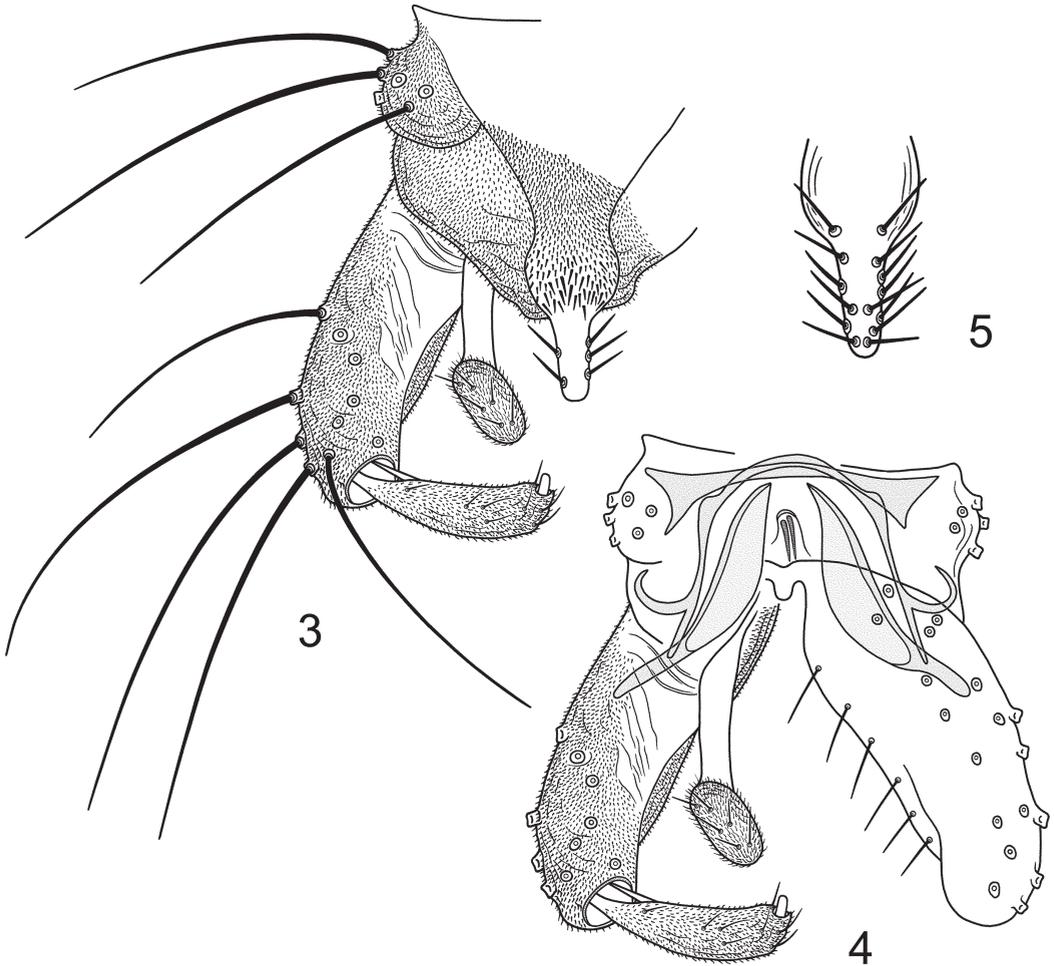
postorbitals. Clypeus with 3–4 setae. Tentorium 84–99 μ m long, 19–21 μ m wide. Stipes 83–92 μ m long, 8–10 μ m wide. Palp segment lengths (in μ m): 17–21, 35–37, 61–69, 48–52, 59–75. Third palpomere with 2–4 sensilla clavata subapically, longest 11–14 μ m long.

Thorax. Antepronotum with 1–3 setae. Dorsocentrals 5–6; acrostichals 7–10, weak, scalpellate in mid scutum; prealars 2–4; supraalar 1. Scutellum with 4 setae, uniserial.

Wing (Figure 1). Venarum ratio (VR) = 1.34–1.42. Costal extension 44–49 μ m long. Brachiolum with 1 seta, remaining cells and veins bare. Squama with 3–4 setae.

Legs. Spur of fore tibia 36–45 μ m long, spurs of mid tibia 23–26 μ m and 21–23 μ m long, spurs of hind tibia 41–43 μ m and 18–22 μ m long. Width at apex of fore tibia 22–24 μ m, of mid tibia 25–28 μ m, of hind tibia 29–30 μ m. Comb with 10–12 setae, longest 25–32 μ m, shortest 14–17 μ m long. Lengths and proportions of legs as in Table 1.

Hypopygium (Figures 3–5). Tergite IX covered with coarse microtrichia; laterosternite IX with



FIGURES 3–5. *Antillocladius bulbosus* sp. n., male. **3.** Hypopygium, dorsal view. **4.** Hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right. **5.** Anal point, ventral view.

TABLE 1. Lengths (in μm) and proportions of legs of *Antillocladius bulbosus* sp. n., male ($n = 1\text{--}3$). LR = Leg ratio, BV = “Bein-Verhältnisse”, SV = “Schenkel-Schiene-Verhältnis”, BR = Bristle ratio.

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄
p ₁	392–412	440–472	368	208	132	72
p ₂	408–420	376–412	176–180	108–112	64–72	40–44
p ₃	456–480	488–508	284–320	176–180	136–144	60–68
	ta ₅	LR	BV	SV	BR	
p ₁	44	0.793	2.704	2.380	3.33	
p ₂	35–37	0.437–0.468	3.810–3.892	4.455–4.622	3.56	
p ₃	40–44	0.582–0.630	2.953–3.057	3.050–3.408	4.90–6.20	

6–12 setae. Anal point with basal swelling, 46–50 μm long from base of swelling, swelling 30–31 μm wide, apical, bare part 23–28 μm long with bluntly rounded apex, 11–13 μm wide at base, 7–8 μm wide apically, with 13–15 strong, anteriorly directed marginal and ventral setae. Phallapodeme 72–77 μm long; transverse sternapodeme arched, 46–49 μm long. Virga composed of 2 spines, 11–17 μm long. Gonocoxite 124–132 μm long. Inferior volsella 57–65 μm long, with slightly curved, parallel-sided base and ovate, 28–30 μm long, 15–19 μm wide apical part, with 8–11 weak setae. Gonostylus club-shaped, 63–71 μm long; megaseta 6–7 μm long. Hypopygium ratio (HR) = 1.84–2.00. Hypopygium value (HV) = 3.04–3.20.

Biology and distribution: The species is only known from the type locality, Reserva Adolpho Ducke, a 10,000 ha reserve in the outskirts of Manaus in the Amazonas State, Brazil. The single male was collected in a Malaise 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 are formed scattered on the forest floor. Reserva Adolpho Ducke is also the type locality for *Ablabesmyia communiba* Neubern, 2013, *Ablabesmyia ducke* Neubern, 2013, *Beardius curticaudatus* Pinho, Mendes & Andersen, 2013, *Dicrotendipes fittkau* Epler, 1988, *Lipurometriocnemus amazonicus* Andersen, Pinho & Mendes, 2016, *Litocladius joergeni* Andersen, 2016, *Litocladius neusae* Mendes, Andersen & Hagenlund, 2011, *Mariambra mariae* Andersen, Mendes & Pinho, 2015, *Saetherocryptus amazonicus* Andersen & Pinho, 2014, *Thalassosmittia amazonica* Andersen & Pinho, 2014 and *Titimbera amazonica* Andersen, Pinho & Mendes, 2015 (Epler 1988, Mendes *et al.* 2011, Oliveira *et al.* 2013, Pinho *et al.* 2013, Andersen & Pinho 2014a, 2014b, Andersen *et al.* 2015a, 2015b, 2016, Andersen 2016).

***Antillocladius simplex* sp. n.** (Figures 2, 6–9)

Type material: *Holotype:* ♂, BRAZIL, Amazonas State, Manaus, Reserva Adolpho Ducke, 1 km after entrance, 4–8.II.2010, Malaise trap, leg. L.C. Pinho & H.F. Mendes (MZUSP).

Paratypes: 9 ♂♂ as holotype (MZUSP, ZMBN).

Etymology: From Latin *simplex* meaning simplicity, referring to the shape of the inferior volsella.

Diagnostic characters: The new species can be separated from its congeners by having a tapering, pointed anal point with strong posteriorly directed marginal setae; a simple, apically bluntly triangular to subrectangular inferior volsella; and wing without apical setae.

Description: *Male* (n = 7–9). Total length 1.89–2.14, 2.02 mm. Wing length 0.98–1.12, 1.06 mm. Total length / wing length 1.71–2.07, 1.91. Wing length / length of profemur 2.45–2.59, 2.50.

Coloration. Thorax dark brown, head and abdomen brown, legs lighter brown.

Antenna. Antennal ratio (AR) = 1.00–1.13, 1.06. Ultimate flagellomere 332–384, 358 μm long.

Head. Temporal setae 6–10, 8 including 2–4, 3 inner verticals, 2–4, 3 outer verticals and 0–2, 1 postorbitals. Clypeus with 3–6, 5 setae. Tentorium 110–119, 115 μm long, 18–21, 19 μm wide. Stipes 90–104, 95 μm long, 11–15, 13 μm wide. Palp segment lengths (in μm): 19–23, 21; 35–41, 37; 75–91, 81; 73–88, 80; 97–116, 105. Third palpomere with 2–3, 3 sensilla clavata subapically, longest 12–14, 13 μm long.

Thorax (Figure 6). Anteprenotum with 1–3, 2 setae. Dorsocentrals 6–10, 8; acrostichals 9–15, 11, scalpellate in mid scutum; prealars 3; supraalar 1. Scutellum with 4–7, 6 setae, uniserial.

Wing (Figure 2). Venarum ratio (VR) = 1.39–1.51, 1.45. Costal extension 44–51, 46 μm long. Brachiolium with 1 seta, remaining cells and veins

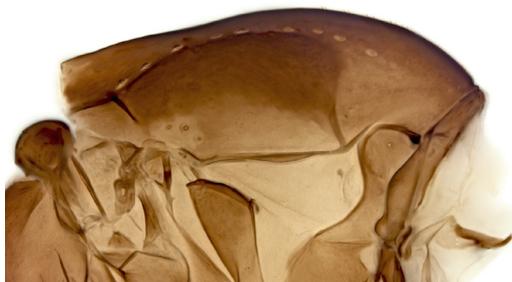
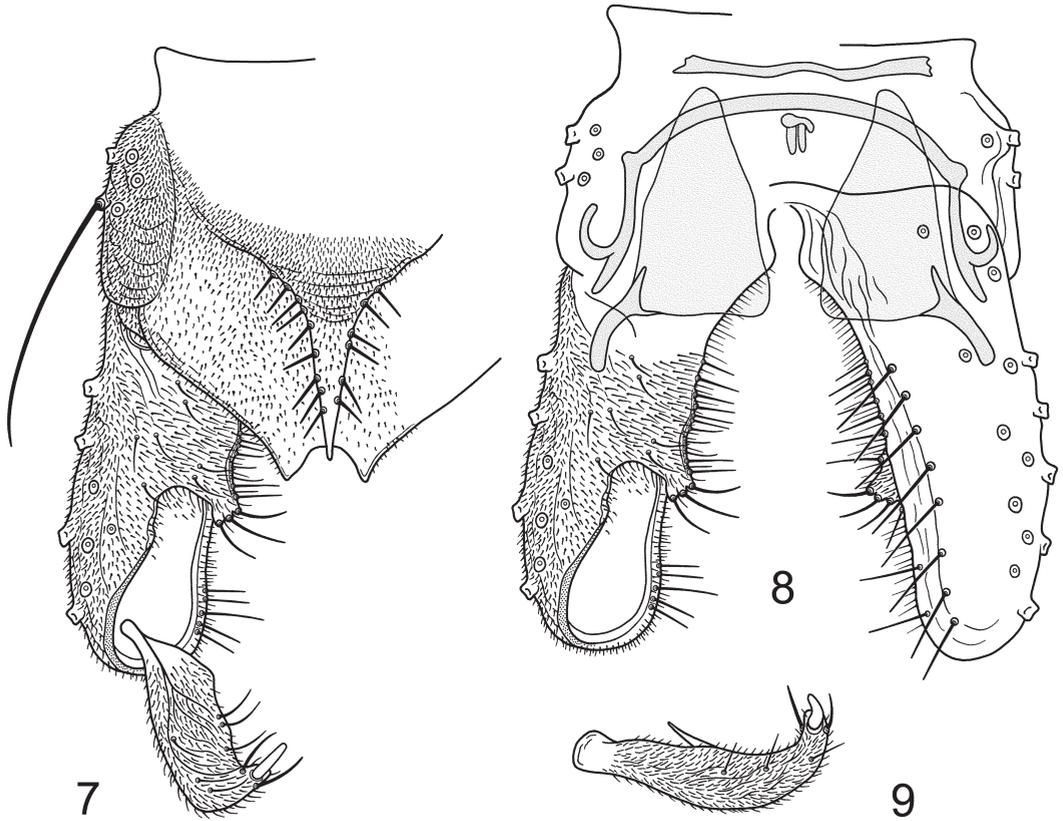


FIGURE 6. *Antillocladius simplex* sp. n., male, dorsal part of thorax, lateral view.



FIGURES 7–9. *Antillocladius simplex* sp. n., male. **7.** Hypopygium, dorsal view. **8.** Hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right. **9.** Gonostylus, lateral view.

TABLE 2. Lengths (in μm) and proportions of legs of *Antillocladius simplex* sp. n., male ($n = 5\text{--}6$, if not otherwise stated). Explanations as in Table 1.

	fe	ti	ta₁	ta₂
p₁	380–448, 410	432–536, 479	332–360, 349	200–216, 209
p₂	432–488, 455	436–484, 457	200–236, 219	116–128, 123
p₃	440–508, 475	480–576, 522	300–336, 318	156–184, 171
	ta₃	ta₄	ta₅	LR
p₁	120–136, 127	72–80, 75	40–48, 43	0.638–0.833, 0.729
p₂	84–96, 89	48–56, 51	32–40, 37	0.439–0.532, 0.479
p₃	124–156, 141	52–72, 63	36–40, 38	0.583–0.641, 0.610
	BV	SV	BR	
p₁	2.560–2.855, 2.721	2.337–2.795, 2.550	2.67–2.89 (2)	
p₂	3.623–3.944, 3.790	3.712–4.600, 4.187	3.50–3.82, 3.72	
p₃	3.010–3.378, 3.198	2.952–3.244, 3.137	4.18–6.18, 4.75	

bare. Squama with 3–5, 4 setae.

Legs. Spur of fore tibia 36–43, 39 μm long, spurs of mid tibia 22–30, 26 μm and 18–25, 21 μm long, spurs of hind tibia 39–47, 42 μm and 18–22, 20 μm long. Width at apex of fore tibia 25–28, 27 μm , of mid tibia 26–29, 27 μm , of hind tibia 32–35, 33 μm . Comb with 11–12, 11 setae, longest 25–33, 29 μm , shortest 18–22, 20 μm long. Lengths and proportions of legs as in Table 2.

Hypopygium (Figures 7–9). Tergite IX covered with coarse microtrichia; laterosternite IX with 5–7, 6 setae. Anal point tapering, pointed, 44–54, 48 μm long, 30–46, 35 μm wide at base, with 10–16, 14 strong, marginal setae. Phallapodeme 77–91, 84 μm long; transverse sternapodeme curved, 81–101, 90 μm long. Virga composed of 2 short, blunt spines, longest 4–10, 6 μm long. Gonocoxite 131–159, 144 μm long. Inferior volsella bluntly triangular to subrectangular apically, 18–23, 21 μm wide, ending 48–52, 50 μm from apex of gonocoxite. Gonostylus curved in apical one-third, 66–76, 69 μm long; megaseta 11–14, 13 μm long. Hypopygium ratio (HR) = 1.90–2.29, 2.06. Hypopygium value (HV) = 2.79–3.06, 2.90.

Biology and distribution: See previous species (*Antillocladius bulbosus* sp. n.).

Discussion

Both new species demonstrate features which are rather atypical for *Antillocladius*. *Antillocladius bulbosus* has a basal swelling of the anal point which is not found in any other described *Antillocladius* species. However, with respect to other characters the new species falls within *Antillocladius*. *Antillocladius simplex* has a simple inferior volsella, rather similar to the volsella found in some species of *Litocladius* Mendes, Andersen & Sæther, 2004. Generally, in *Antillocladius* species the inferior volsella is well set off and consists of two parts or is specialized in other ways. However, the new species lacks the characteristic virga with strong lateral lamellae found in *Litocladius* and it has only scalpellate acrostichals in mid scutum and not the additional anterior decumbent and hair-like setae found in

this genus. Both species thus appear to be best served when placed in *Antillocladius*.

In the key to the males of *Antillocladius* in Mendes *et al.* (2011), *A. bulbosus* will key to couplet 2 as it has setae on squama, but no further due to the basal swelling of the anal point. *Antillocladius simplex* will also key to couplet 2 as it has setae on squama. Based on the tapering anal point with strong, posterolaterally directed setae it will further key to couplet 9. However, the simple shape of the inferior volsella does not fit in couplet 9 as the alternatives are an inferior volsella with a dorsal anterior triangular to digitiform part and a more rounded ventral lobe, or a circular inferior volsella with or without additional rounded posterior extension.

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