

A new species of *Litocladius* Mendes, Andersen & Sæther, 2004 from the Amazon rainforest, Brazil (Diptera, Chironomidae, Orthoclaadiinae)

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Litocladius joergeni sp. n. is described and figured based on a male collected in a Malaise trap in the Reserva Adolpho Ducke near Manaus in Amazonas. The new species can be separated from its congeners by the combination of having an apical spine on third palpomere, wing with setae only on vein M_{1+2} and in cell r_{4+5} , a subquadrangular inferior volsella with several strong setae and a very long, complex virga surrounded by strong lamellae.

Key words: Diptera, Chironomidae, Orthoclaadiinae, *Litocladius joergeni*, new species, Brazil, Neotropical region.

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Introduction

The genus *Litocladius* was erected by Mendes *et al.* (2004) based on *L. mateusi* Mendes, Andersen & Sæther, 2004 from São Paulo State in Brazil. The males can be separated from other orthoclaids by having scalpellate acrostichals, a long virga with lateral lamellae, a short costal extension, setae on squama and a long anal point with lateral setae. The larvae are probably terrestrial or semiterrestrial as pupae have been collected among mosses.

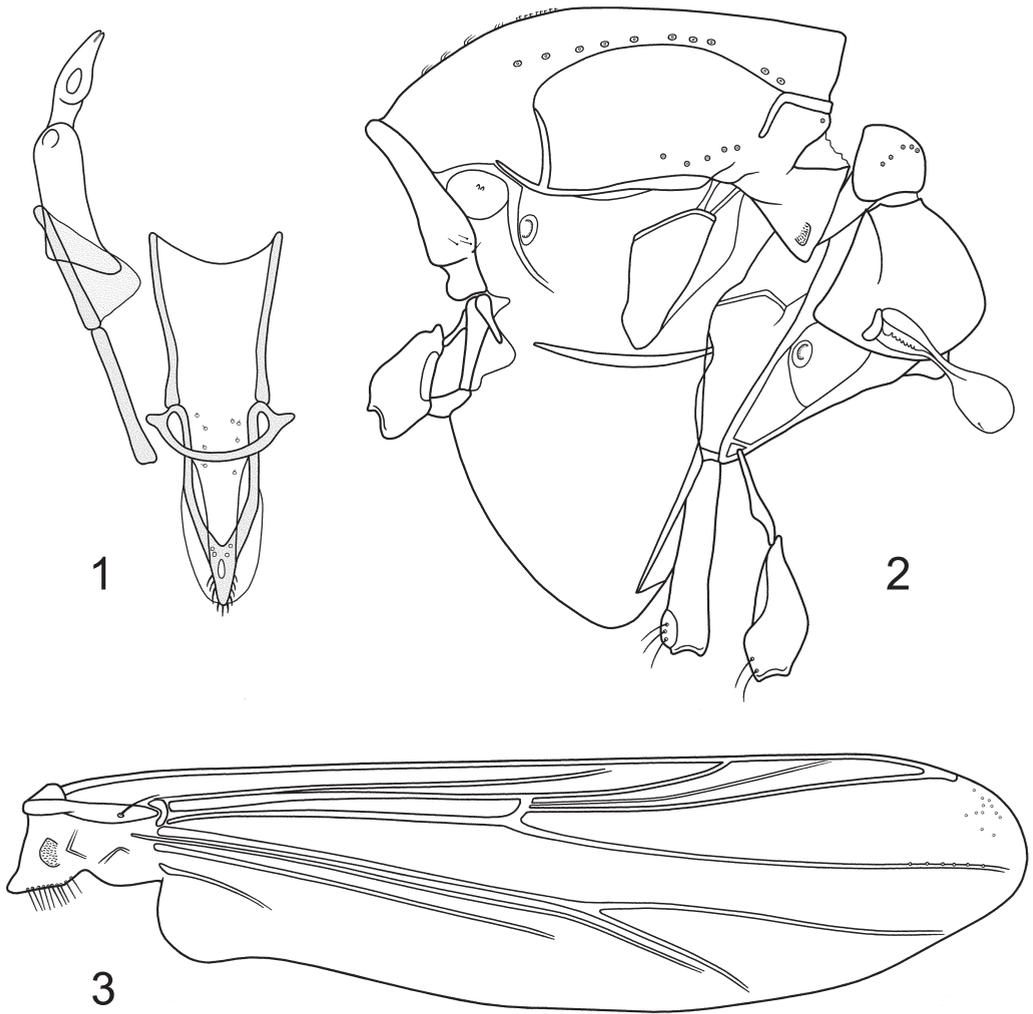
A total of five *Litocladius* species have been described from South and Central America so far, *L. mateusi*, *L. confusus* Mendes & Andersen, 2008 from Rio de Janeiro State, *L. floripa* Mendes & Andersen, 2008 from Santa Catarina, São Paulo and Rio de Janeiro States and *L. neusae* Mendes, Andersen & Hagenlund, 2011 from the Amazonas State, Brazil and *L. chavarriai* Mendes, Andersen

& Hagenlund, 2011 from the Alajuela Province, Costa Rica (Mendes *et al.* 2004, 2011, Mendes & Andersen 2008). In addition one species from Oriental China, *L. liangae* Lin, Qi & Wang, 2013 was recently described by Lin *et al.* (2013). Below a seventh species is described and figured based on a male from the Amazon rainforest in Brazil.

Material and methods

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

The holotype will be kept in the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP).



FIGURES 1–3. *Litocladius joergeni* sp. n., male. 1. Tentorium, stipes and cibarial pump. 2. Thorax. 3. Wing.

***Litocladius joergeni* sp. n.** (Figures 1–5)

Type material: *Holotype*: male, BRAZIL, Amazonas State, Manaus, Reserva Adolpho Ducke, 1 km after entrance, 04–08.II.2010, Malaise trap, leg. L.C. Pinho & H.F. Mendes (MZUSP).

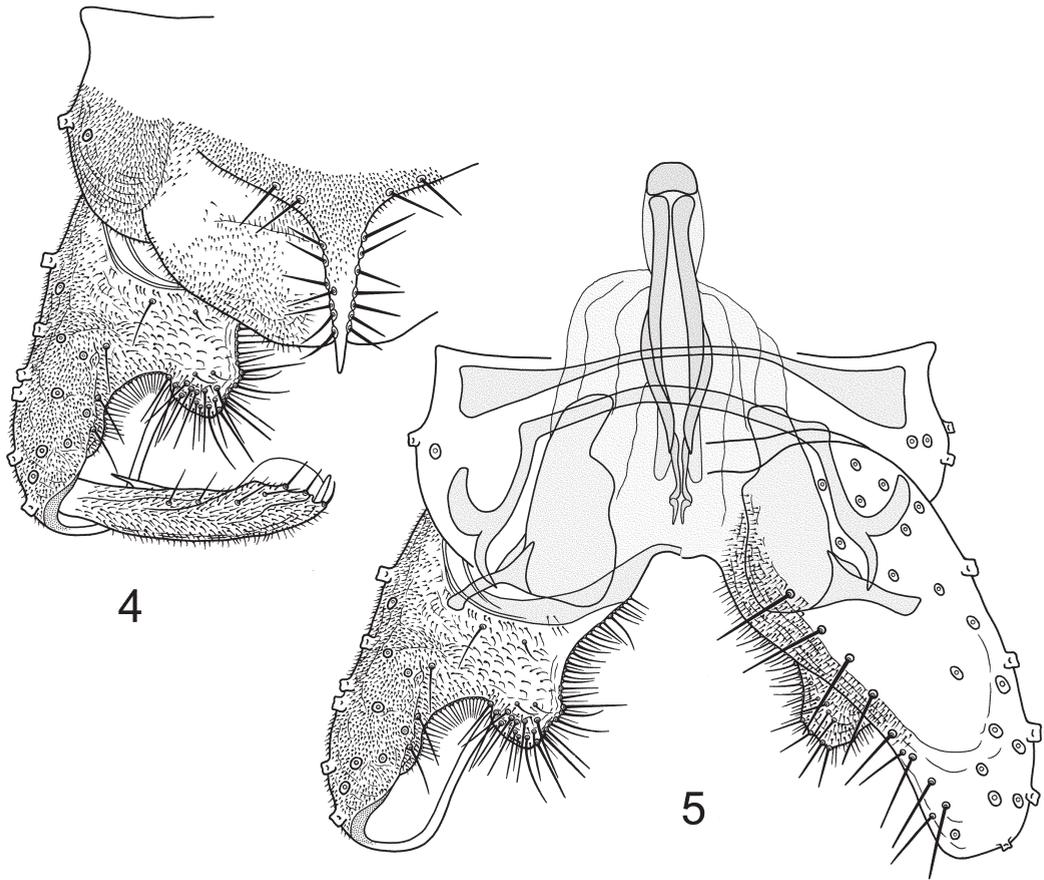
Etymology: The species is named after Jørgen Rieber-Mohn for all help and support.

Diagnostic characters: The new species can be separated from its congeners by having apical spine on third palpomere combined

with a subquadrangular inferior volsella with several strong setae, a very long, complex virga surrounded by strong lamellae and wing with setae only on vein M_{1+2} and in cell r_{4+5} .

Description: Male ($n = 1$). Total length 2.91 mm. Wing length 1.54 mm. Total length / wing length 1.89. Wing length / length of profemur 2.52.

Coloration. Brown, thorax with light brown stripes, legs light brown, abdomen brown with dark brown hypopygium.



FIGURES 4-5. *Litocladius joergeni* sp. n., male. 4. Hypopygium, dorsal view. 5. Hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Antenna. Antennal ratio (AR) = 1.49. Ultimate flagellomere 572 μm long.

Head. Temporal setae 11 including 4 inner verticals, 2 outer verticals and 5 postorbitals. Clypeus with 5 setae. Tentorium, stipes and cibarial pump as in Figure 1. Tentorium 119 μm long, 25 μm wide. Stipes 129 μm long, 37 μm wide. Palp segment lengths (in μm): 26, 48, 110, 117, 132. Third palpomere with 3 sensilla clavata subapically, longest 8 μm long; and apparently with 1 apical spine – spine missing, but third palpomere with strong, apical scar.

Thorax (Figure 2). Antepronotum with 4 setae. Dorsocentrals 10; acrostichals 17 composed of 6 anterior weak decumbent, 3 weak hair-like and 8 scalpellate in mid scutum; prealars 5; supraalar 1.

Scutellum with 11 setae, uniserial.

Wing (Figure 3). Venarum ratio (VR) = 1.26. Costal extension 35 μm long. Brachiolum with 1 seta, M_{1+2} with 6 setae apically, cell r_{4+5} with 12 setae, remaining cells and veins bare. Squama with 10 setae.

Legs. Spur of fore tibia 58 μm long, spurs of mid tibia 33 μm and 21 μm long, spurs of hind tibia 65 μm and 32 μm long. Width at apex of fore tibia 28 μm , of mid tibia 36 μm , of hind tibia 44 μm . Comb with 10 setae, longest 40 μm , shortest 25 μm long. Lengths and proportions of legs as in Table 1.

Hypopygium (Figures 4–5). Tergite IX covered with microtrichia, with 2 strong setae to each side of the base of the anal point; laterosternite IX with

TABLE 1. Lengths (in μm) and proportions of legs of *Litocladius joergeni* sp. n., male ($n = 1$). LR = Leg ratio, BV = “Bein-Verhältnisse”, SV = “Schenkel-Schiene-Verhältnis”.

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV
p ₁	613	662	–	–	–	–	–	–	–	–
p ₂	629	605	294	163	147	74	49	0.486	3.528	4.194
p ₃	662	719	474	253	196	82	57	0.659	3.153	2.913

4 setae. Anal point tapering, 80 μm long, 33 μm wide at base, 2 μm wide at apex, with 14 strong, marginal setae. Phallapodeme 119 μm long; transverse sternapodeme weakly curved, 127 μm long. Virga complex, 150 μm long including 11 μm long apical pincer-shaped part, surrounded by strong lamellae. Gonocoxite 207 μm long. Inferior volsella subquadrangular, 37 μm long, 41 μm wide, ending 73 μm from apex of gonocoxite. Gonostylus 113 μm long, with rounded, apical crista dorsalis; megaseta 12 μm long. Hypopygium ratio (HR) = 1.83. Hypopygium value (HV) = 2.58.

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, *Ablabesmyia ducke* Neubern, *Beardius curticaudatus* Pinho, Mendes & Andersen, *Dicrotendipes fittkau* Epler, *Lipurometrioctenemus amazonicus* Andersen, Pinho & Mendes, *Litocladius neusae* Mendes, Andersen & Hagenlund, *Mariambara mariae* Andersen, Mendes & Pinho, *Saetherocryptus amazonicus* Andersen & Pinho, *Thalassosmittia amazonica* Andersen & Pinho and *Titimbera amazonica* Andersen, Pinho & Mendes (Epler 1988, Mendes *et al.* 2011, Oliveira *et al.* 2013, Pinho *et al.* 2013, Andersen & Pinho 2014a, 2014b, Andersen *et al.* 2015a, 2015b, 2016).

Discussion

Litocladius joergeni sp. n. groups with *L. chavarriai*, *L. floripa* and *L. neusae* based on the presence of 1–2 apical spines on third palpomere. With a wing length of 1.54 mm the new species is slightly larger than the other three species except *L. chavarriai* and has a higher antennal ratio (AR) than the others, 1.49 compared to 0.73–0.85 in *L. chavarriai*, 1.14 in *L. neusae* and 1.04–1.48 in *L. floripa*. Further, *Litocladius joergeni* sp. n. has less setae on the wing than the other three species; only wing vein M_{1+2} and cell r_{4+5} are setose, while the others all have setae on vein R and there are e.g. 80–140 setae in cell m_{1+2} in *L. chavarriai*, 43–76 in *L. floripa* and 1–3 setae in *L. neusae*.

In *L. floripa* the inferior volsella is bluntly triangular, in *L. neusae* rounded with few setae, while *L. chavarriai* has a rounded inferior volsella with dorsal ridge and strong setae; in *L. joergeni* sp. n. this volsella is subquadrangular with several strong setae. The most striking differences between the species are in the size and shape of the virga. In *L. joergeni* sp. n. the virga is 150 μm long compared to 50–51 μm in *L. neusae*, 86–92 μm in *L. chavarriai* and 82–95 μm in *L. floripa*. It is composed of several intertwined spines surrounded by strong lamella and the apical pincer-shaped part is comparatively much shorter in *L. joergeni* sp. n. than in the other three species.

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References

- Andersen, T. & Pinho, L.C. 2014a. A new species of *Saetherocryptus* Andersen *et* Mendes, 2007 (Diptera: Chironomidae, Orthoclaadiinae) from the Amazon rainforest, Brazil. *Norwegian Journal of Entomology* 61, 160–164.
- Andersen, T. & Pinho, L.C. 2014b. A new *Thalassosmittia* Strenzke & R Emmert, 1957 out of the sea: *T. amazonica* n. sp. from the Amazon rainforest, Brazil (Diptera: Chironomidae, Orthoclaadiinae). *Chironomus Newsletter on Chironomidae Research* 27, 25–30.
- Andersen, T., Mendes, H.F. & Pinho, L.C. 2015a. *Mariambera*, a new genus of Orthoclaadiinae from Brazil (Insecta: Diptera, Chironomidae). *Studies on Neotropical Fauna and Environment* 50, 24–30.
- Andersen, T., Mendes, H.F. & Pinho, L.C. 2015b. *Titimbera*, a new genus of Orthoclaadiinae from South and Central America (Diptera: Chironomidae). *Studies on Neotropical Fauna and Environment* 50, 96–106.
- Andersen, T., Pinho, L.C. & Mendes, H.F. 2016. Two new species of *Lipurometriocnemus* Sæther from Brazil (Diptera: Chironomidae, Orthoclaadiinae). *Biotemas* 29, 37–45.
- Epler, J.H. 1988. Biosystematics of the genus *Dicrotendipes* Kieffer, 1913 (Diptera: Chironomidae) of the world. *Memoirs of the American Entomological Society* 36, 1–214.
- Lin, X., Qi, X. & Wang, X. 2013. *Litocladius* Mendes, Andersen & Sæther, 2004, a newly recorded genus of Orthoclaadiinae from Oriental China (Diptera: Chironomidae). *Pan-Pacific Entomologist* 89, 143–146.
- Mendes, H.F., Andersen, T. & Sæther, O.A. 2004. A review of *Antillocladius* Sæther, 1981; *Comptosmittia* Sæther, 1981 and *Litocladius* new genus (Chironomidae, Orthoclaadiinae). *Zootaxa* 594, 1–82.
- Mendes, H.F. & Andersen, T. 2008. A review of *Antillocladius* Sæther and *Litocladius* Mendes, Andersen *et* Sæther, with the description of two new Neotropical genera (Diptera, Chironomidae, Orthoclaadiinae). *Zootaxa* 1887, 1–75.
- Mendes, H.F., Andersen, T. & Hagenlund, L.K. 2011. New species and records of *Antillocladius* Sæther and *Litocladius* Mendes, Andersen *et* Sæther from Brazil and Costa Rica (Chironomidae: Orthoclaadiinae). *Zootaxa* 2915, 39–51.
- Oliveira, C.S.N. de, Silva, M.A.N. & Gessner, A.A.F. 2013. Neotropical *Ablabesmyia* Johannsen (Diptera: Chironomidae, Tanypodinae) - part I. *Zootaxa*, 3733, 1–123.
- Pinho, L.C., Mendes, H.F. & Andersen, T. 2013. Revision of *Beardius* Reiss *et* Sublette, 1985 (Diptera: Chironomidae), with the description of twenty new species. *Zootaxa* 3742, 1–78.
- Sæther, O.A. 1969. Some Nearctic Podonominae, Diamesinae and Orthoclaadiinae (Diptera: Chironomidae). *Bulletin of the Fisheries Research Board of Canada* 107, 1–154.
- Sæther, O.A. 1980. Glossary of Chironomid morphology terminology (Diptera: Chironomidae). *Entomologica scandinavica*, Supplement 14, 1–51.

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