

The female of *Lopescladius inermis* SÆTHER, 1983 (Chironomidae, Orthoclaadiinae)

[Das Weibchen von *Lopescladius inermis* SÆTHER, 1983 (Chironomidae, Orthoclaadiinae)]

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Abstract	The female of <i>Lopescladius inermis</i> SÆTHER is described. Unique features of the female genitalia include a large, ventrally placed, bare gonocoxite and large, pale seminal capsules with spermathecal neck placed anteriorly on capsule. Other features support the presumed sister-group relationship between <i>Lopescladius</i> and <i>Stictocladus</i> EDWARDS. The previous description of the male imago of <i>L. inermis</i> is corrected to include a spine-like inferior volsella.
Key words	Chironomidae, Orthoclaadiinae, <i>Lopescladius inermis</i> , female, male diagnosis
Zusammenfassung	Das Weibchen von <i>Lopescladius inermis</i> SÆTHER wird beschrieben. Einzigartige Merkmale der weiblichen Genitalia sind ein großer, ventral platzierter, kahler Gonocoxit und große, blassee Seminalkapseln. Andere Merkmale unterstützen die angenommene Schwestergruppen-Beziehung zwischen <i>Lopescladius</i> und <i>Stictocladus</i> EDWARDS. Die frühere Beschreibung des Männchens von <i>L. inermis</i> wird hier um den Besitz einer spitzen unteren Volsella ergänzt.
Stichwörter	Chironomidae, Orthoclaadiinae, <i>Lopescladius inermis</i> , Weibchen, Diagnose des Männchens

Introduction

The genus *Lopescladius* was described by OLIVEIRA (1967) based on *Lopescladius minutissimus* OLIVEIRA from the Amazon in Brazil. Later SÆTHER (1983) revised the genus adding three named species, six unnamed taxa based on pupae, and showing that the nomen nudum “*Cordites*” (BRUNDIN 1966: 428) meant the same taxon as *Lopescladius*. COFFMAN & ROBACK (1984: 130) presented the latest described species as *Lopescladius (Cordiella) hyporheicus*.

The female genitalia of *Lopescladius* had not been described so far. In many instances they give definite clues to the sister relationships between genera. Below the female of *Lopescladius inermis* SÆTHER, 1983 is described as the first female of the genus.

Methods and terminology

The general terminology follows SÆTHER (1980). The measurements are given as ranges. The specimens are deposited at the Museum of Zoology, University of Bergen, Bergen, Norway (ZMBN).

Lopescladius OLIVEIRA, 1967

Unknown gen. et spec. near *Corynoneura*; ROBACK (1953): 113, 1957: 56.

“*Cordites*” of BRUNDIN (1966: 428), nomen nudum (I.C.Z.N 1999: Article 13.3.).

Lopescladius OLIVEIRA, 1967: 417; SÆTHER (1983: 280); CRANSTON et al. (1983: 157); COFFMAN et al. (1986: 160); CRANSTON et al. (1989: 176).

Cordiella COFFMAN & ROBACK, 1984: 130, as subgenus.

Type species: *Lopescladius minutissimus* OLIVEIRA, 1967, by original designation and monotypy.

Generic diagnoses for the male imago and for the immatures are given by SÆTHER (1983), CRANSTON et al. (1983), and COFFMAN & ROBACK (1984).

Female imago. As in male with the following additions: **Abdomen:** Tergites and sternites without or with very few setae. **Genitalia:** Gonocoxapodemes not apparent. Gonocoxite (Fig. 2) nearly entirely membranous, placed entirely ventrally, without setae, apparently with a few basal microtrichia. Tergite IX (Fig. 3) weakly divided, with several setae. Gonapophysis IX with large dorsomesal lobe (Fig. 7) and very small ventrolateral lobe (Fig. 6). Apodeme lobe circular (Fig. 5). Vagina with anterolateral floor and an anteriomedian projection. Labia (Fig. 4) relatively large. Cerci (Figs 2, 3) small. Seminal capsules (Fig. 2) very large and pale. Spermathecal ducts start out narrow and with some bends near anterior end of seminal capsules, become broad and nearly straight more posteriorly, and ends in separate openings.

Lopescladius inermis SÆTHER, 1983

(Figs 1–7)

Lopescladius inermis SÆTHER, 1983: 293, Fig. 5.

Material examined: USA: Kansas, Meade Co., artesian spring at Meade Co. State Lake, holotype ♂, 16.vii.1980, P. LIECHTI & M. ORBOIS (ZMBN Type No. 73); Wisconsin, La Crosse Co., Mississippi River near La Crosse, Wisconsin Conference Center, 2 ♀♀, 2 ♂♂, 4.vi.2001, B. CALDWELL (ZMBN).

Male imago. The male imago is described by SÆTHER (1983). However, the stated absence of an inferior volsella, giving the species its name, is in error. Re-examination of the holotype has shown that there indeed is an inferior volsella of the same type as in the other members of the subgenus. The inferior volsella was overlooked because of its orientation on the slide preparation. Some specimens of *L. minutissimus* have been re-examined. The preparations were not clear enough, but also this species may have a similar inferior volsella.

Also, the sclerotized anterior margin of the phallapodeme lobe is not properly illustrated in SÆTHER (1983: Fig. 5). The wing lengths of the specimens from the Mississippi River are 0.72 mm, the antennal ratios 0.53–0.56, and the thirteenth flagellomeres 109–135 µm long. A new illustration of the male hypopygium is given in Fig.1.

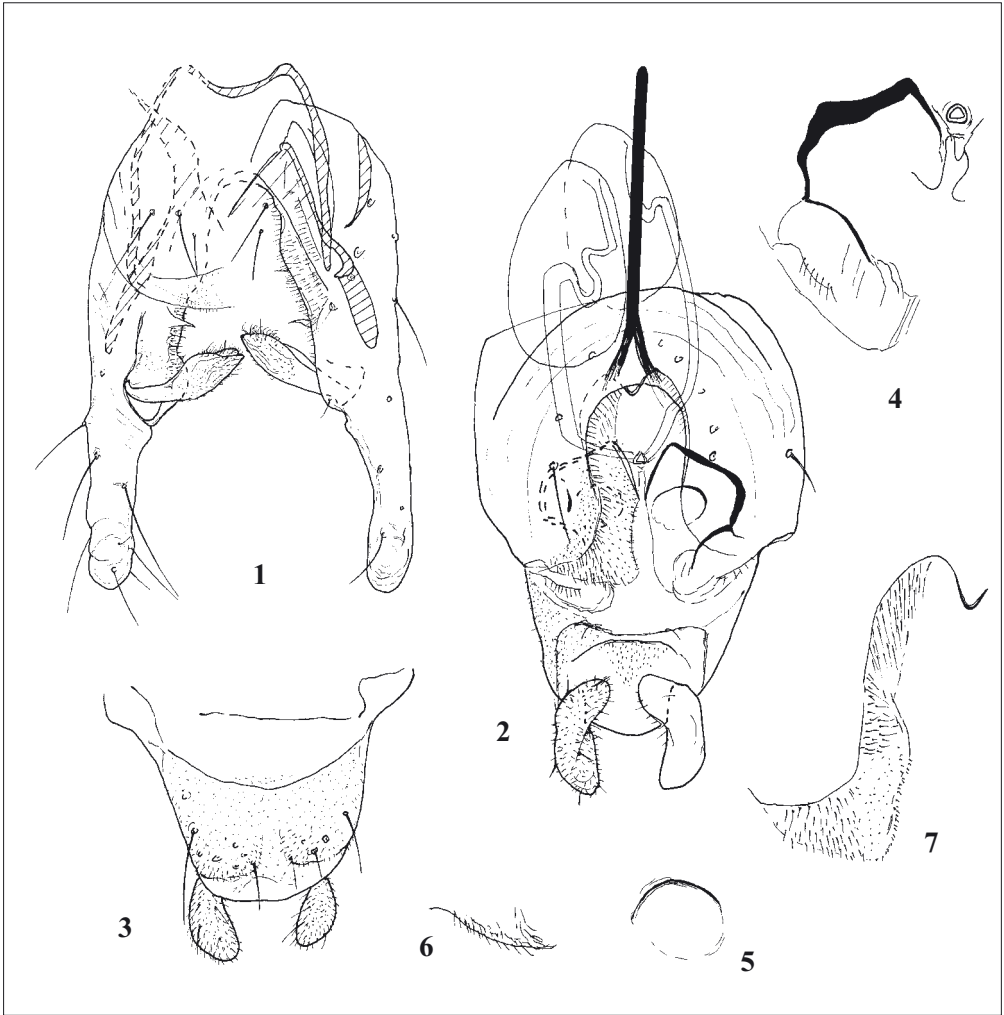
Female imago (n = 2 except when otherwise stated). Total length 1.35–1.36 mm. Wing length 0.75–0.76 mm. Total length/wing length 1.80. Wing length/length of profemur 2.87–2.99. Coloration pale yellowish brown with darker vittae, postnotum and lower parts of preepisternum.

Head: Antenna with 4 flagellomeres, indication of fusion of fourth and fifth flagellomere present in 3 of 4 antennae; flagellomere length (in µm): 40–43, 21–23, 25–26, 90–116. AR 0.97–1.22. Temporal setae absent. Clypeus with 2–4 setae. Tentorium 85 µm (1) long, 5 µm (1) wide; stipes 71–78 µm long. Palpomere lengths in µm: 12–13, 14, 21, 30–36, about 36 (1). Sensilla clavata not observed on third palpomere.

Thorax: Antepronotum with 1 seta. Dorsocentrals 4; prealars 2–3. Scutellum with 2 setae. **Wing:** VR 1.50–1.70. Brachiolum with 1 seta, other veins bare. **Legs:** Spur of front tibia 15 µm long; of middle tibia 19 µm long; of hind tibia 28–30 µm, second spur not measurable. Width at apex of front tibia 15–19 µm, of middle tibia 19 µm, of hind tibia 24–26 µm. Hind tibial comb with 9 setae, shortest seta 14–19 µm long, longest seta 21–23 µm long. Lengths (in µm) and proportions of legs:

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
p ₁	251–263	285–300	81–86	36–38	26–30	19–23	19	0.28–0.29	5.98–6.18	6.12–6.65	1.8–2.3
p ₂	195–206	221–229	71–75	43–45	30–34	15–19	23	0.32–0.33	4.25–4.41	5.80–5.84	1.8–2.3
p ₃	219–221	270–281	75–83	41–49	26–28	13–15	21–23	0.28–0.29	5.20–5.45	6.09–6.50	1.8–2.0

Abdomen: Tergite I and sternites I–III bare; tergites II–VII and sternites IV–VI each with 1 strong median seta and 1 weak lateral seta to each side; tergite VIII with 1–3 median setae and each side with



Figs 1–7: *Lopescadius inermis* SÆTHER, 1983. – 1: Male imago, hypopygium. Dorsal view to the left, ventral aspect and apodemes to the right. – 2–7: Female genitalia. – 2: Ventral view; – 3: Dorsal view; – 4: Coxosternapodeme, gonocoxite IX and labia; – 5: Apodeme lobe; – 6: Ventrolateral lobe; – 7: Dorsomesal lobe.

1 seta; sternite VII with 1–2 median setae and lateral seta; sternite VIII with 7–9 median setae and each side with 3 setae. **Genitalia** (Figs 2–7): Gonocoxite (Fig. 4) membranous, bare, but with a few basal microtrichia. Tergite IX with 10–12 setae. Cercus 43–44 μm long. Seminal capsule 76–78 μm long, 31–36 μm wide. Notum 97 μm long.

Systematics

SÆTHER (1983) postulated that the genus was an aberrant and apomorphic member of the *Parakiefferiella* group based on, among other characters, the medially bent male gonostylus, the hairy eyes, the extension of the pupal anal lobe, the whip-like terminal segment of the larval antenna etc.

However, the immatures of the genus *Stictocladus* EDWARDS, 1931, had not been described at the time. CRANSTON (1991, 1996) described the immatures of the Australian species. The ge-

nus, which also occurs in South and Central America is presently being revised. The pupa of *Stictocladius* shows many similarities with that of *Lopescladius*, including the digitiform extensions on the pupal anal lobe and posterior spines on tergites and sternites, the latter features shared also with *Heleniella* GOWIN, 1943. *Lopescladius* has metathoracic leg sheaths extending beyond the wing sheath as in *Stictocladius*, but in contrast to the free leg sheaths in *Stictocladius*, the sheaths are joined along sutures in *Lopescladius*.

Brillia KIEFFER, 1913, *Heleniella* and *Stictocladius* all have larvae with the second antennal segment divided, whereas this segment is partly unsclerotised in *Lopescladius* and *Stictocladius* and the basal part more weakly sclerotized in *Heleniella*.

The thin and hair-like terminal antennal segment in *Lopescladius* and *Stictocladius* is found also in *Heterotrissocladius* SPÄRCK, 1923 and some related genera as well as in *Parakiefferiella* THIENEMANN, 1936 and some relatives. *Lopescladius* and *Stictocladius*, share a cordiform tarsomere 4 with *Cardiocladius* KIEFFER, 1912.

Although *Stictocladius* appears to be the closest relative of *Lopescladius* other possibilities are that *Heleniella* is the sister genus or that none of them are particularly close.

The large, unsclerotized, bare, ventrally placed gonocoxite recognisable by the position of the coxosternapodeme (Fig. 4) is unique within the orthoclads. However, the anterior end of vagina with the median projection and the anterolateral floor, although unusual, is found both in *Stictocladius* and to some extent in *Heleniella*. The large uncoloured seminal capsule with the anterior origin of the spermathecal duct is similar only to some *Corynoneura* WINNERTZ, 1846 (SÆTHER 1977: Fig. 61). Some *Stictocladius* have large pale seminal capsules with neck not placed posteriorly. The seminal capsules of *Heleniella* are dark sclerotized with pronounced posterior placed neck (SÆTHER 1977: Fig. 57).

The gonapophysal lobes are rather different from those of *Heleniella*, but quite similar to what is present in *Stictocladius*. In fact, except for the gonocoxite and the placement of the spermathecal ducts on the seminal capsule, the female genitalia of *Lopescladius* could have belonged to a *Stictocladius*. Although not all of the similarities may turn out to be synapomorphies in an analysis, the presumed sister-group relationship between *Lopescladius* and *Stictocladius* appears not contradicted by the female genitalia.

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