A redefinition of *Acamptocladius* Brundin, 1956 (syn. *Phycoidella* Sæther, 1971, n. syn.) (Diptera: Chironomidae), with the description of *A. reissi* n.sp.

PETER S. CRANSTON and OLE A. SÆTHER


*Acamptocladius* Brundin, 1956 is shown to be a senior synonym of *Phycoidella* Sæther, 1971, and the generic diagnosis emended. A new combination, *Acamptocladius dentolatens* (Sæther, 1971), is established. The male and female imagines of *A. submontanus* are redescribed and the possible larva described. A new species, *A. reissi*, is described in all stages and both sexes. A key to the three species is given for all stages and both sexes. All larvae have been found in acid and humic pools and lakes. Some presumed first instar larvae found in unionid mussels may belong to *Acamptocladius*.


The immature stages of an orthoclad collected in Oberbayern by Dr F. Reiss, Zoologisches Staatssammlung, Munich appeared to belong to the genus *Phycoidella* Sæther, 1971. This monotypic genus was described from colonies of blue-green algae in a Canadian lake. The associated adults, however, were tentatively identified as *Acamptocladius submontanus* (Edw.). A closer comparison with the types of *A. submontanus* revealed that the species belonged to a new species which we propose to name *A. reissi* n. sp. in honour of Dr Reiss. The differences mentioned by Sæther (1971:1812) between *Phycoidella* (type-species *P. dentolatens* Sæther) and *Acamptocladius* Brundin (1956:162) did not hold up. Except for the shape of the anal point and the undivided volsella the two European species of *Acamptocladius* conform to the generic diagnosis of *Phycoidella*. Thus *Phycoidella* must be regarded as a junior synonym of *Acamptocladius*.

The general terminology in the following descriptions follows Sæther (1980). The measurements are given as ranges followed by a mean when three or more specimens are measured; n = number measured.

*Acamptocladius* Brundin, 1956: 162


Type species: *Acamptocladius submontanus* (Edwards, 1932: 46) (as *Spaniotoma* (Smitia) submontana) by original designation.

Other included species: *Acamptocladius dentolatens* (Sæther, 1971: 1814, as *Phycoidella dentolatens*), n. comb., *Acamptocladius reissi* n. sp.

Emended diagnosis: As Sæther, 1971: 1810, 1977: 102 for *Phycoidella*, except:

*Imago* — Female with 5 flagellomeres. Antennal groove in male reaching flagellomere 3; flagellomeres 2, 3 and 13 with sensilla chaetica. Costa not or barely extended. Sensilla chaetica present on ta, of hind leg in male, on mid and hind leg in female. Anal point small, triangular, broad based, rounded apically or with apical point. Gonocoxite with single or double, inferior volsella.

*Pupa* — Ocular field with 2 postorbitalis, no vertical. Antepronotum with 2 median and only 1 lateral seta. Dorsocentrals 4, anterior two forming one group, posterior two another. Wing sheath smooth. Leg sheath all recurved beneath wing sheath. Segments II–VIII with one dorsal and one ventral pair of 0 setae. Shagreen
absent on tergites I and II, may be present on all other tergites. Hooklets on tergite II and well developed pedes spurii B present (not clear in *A. dentolatens* since segments 1–2 damaged). L setae on VIII about 1/3–1/2 as long as width of segment. Genital sac of male extends beyond anal lobe.

$Larva$ — AR about 1.5–3. Dorsomentum with 12–18 teeth on each lateral plate.

---

**Key to males**

1. Anal point with triangular base and narrow parallel-sided apex, volvella single and weak (Sæther 1971, fig. 9C) ........ *A. dentolatens* (Sæth.)
   
   - Anal point triangular with broadly rounded apex, volvella double and more produced .............. 2

2. AR about 1.3, about 11 dorsocentrals, phallopode longer than transverse sternapodeme, volvella relatively well developed (Fig. 1D) ...................... *A. submontanus* (Edw.)

---

**Key to females**

1. Gonocoxite IX with about 10 subequal, relatively short setae (Fig. 2E); cercus not reaching gonapophyses VIII in ventral view. .... *A. reissi* n. sp.
   
   - Gonocoxite IX with 3–4 long setae and 0–2 short setae, cercus reaching gonapophyses VIII ........ 2

2. Clypeus with about 12 setae, cercus reaching dorsomesal lobe (Fig. 2A) ................... *A. submontanus* (Edw.)

   - Clypeus with about 6 setae, cercus not reaching dorsomesal lobe (Sæther 1971 fig. 10) ............ *A. dentolatens* (Sæth.)
Key to known pupae

1. Thoracic horn slightly more than 2x as long as wide (Sæther 1971 fig. 11B); L setae of segment VIII about 0.5x as long as width of segment (Sæther 1971 fig. 11A). ... A. dentolatens (Sæther)
   – Thoracic horn more than 3x as long as wide (Fig. 3C), L setae of VIII about 1/3 as long as width of segment (Fig. 3A, B). ................. A. reissi n.sp.

Key to larvae

1. AR about 2.9–3.0 (Sæther 1971 fig. 12D) ................. A. dentolatens (Sæther)
   – AR about 1.6–2.1 ................. 2
2. Anal tubules ovoid, subequal to or longer than posterior parapods (Fig. 4E); antennal segment 3 distinctly shorter than 2 (Fig. 4B). ... A. reissi n.sp.
   – Anal tubules tapering to a blunt point, distinctly shorter than posterior parapods; antennal segment 3 subequal in length to 2. ......... A. sp. (? submontanus (Edw.))

Acamptocladus submontanus (Edw.)

Figs. 1D, 2A–C


Diagnosis: The imago is characterized by having a wing length of about 1.8 mm, barely extended costa, a male AR of about 1.3, about 10–11 dorso-centrals, anal point triangular without apical point, phallopodeme longer than transverse sternapodeme, pronounced double inferior volsella, and female with about 2 long and 2 short setae on gonocoxite IX.

Male imago (n=1)

Total length 3.53 mm. Wing length 1.78 mm. Total length/wing length 1.98. Wing length/length of profemur 3.03.


Wing — VR 1.21. Branchiolum with 1 seta, other veins bare. Extended part of costa 38 μm long.

Legs — Spur of front tibia 36 μm long; spurs of middle tibia 19 μm and 11 μm, of hind tibia 56 μm and 15 μm long. Width at apex of front tibia 41 μm, of middle tibia 45 μm, of hind tibia 49 μm. Comb of hind tibia 11 setae 26–41 μm long. Sensilla chaetica 3 at 0.14 to 0.22 of ta1 of hind leg. Tarsal pseudospurs present at apices and along ta1–ta5 of all legs. Lengths (micrometers) and proportions of legs:

<table>
<thead>
<tr>
<th></th>
<th>ta4</th>
<th>ta5</th>
<th>LR</th>
<th>BV</th>
<th>SV</th>
<th>BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1</td>
<td>104</td>
<td>76</td>
<td>0.52</td>
<td>2.98</td>
<td>3.51</td>
<td>3.0</td>
</tr>
<tr>
<td>p2</td>
<td>95</td>
<td>76</td>
<td>0.49</td>
<td>3.19</td>
<td>3.94</td>
<td>5.4</td>
</tr>
<tr>
<td>p3</td>
<td>104</td>
<td>76</td>
<td>0.54</td>
<td>2.88</td>
<td>3.33</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Hypopygium (Fig. 1D) — Ninth tergum with 8 setae on margins of anal point, laterosternite IX with 6 setae. Phallopodeme 81 μm long, with 2–3 apical spines. Transverse sternapodeme 64 μm long. Gonocoxite 223 μm long; with well developed double, inferior volsella. Gonostylus with 14 μm long apical spine. HR 2.19, HV 3.46.

Female imago (n=1)

Total length 2.49 mm.


Wing — VR 1.23. Branchiolum with 1 seta, R with 9 setae, R1 with 2 setae, extended part of costa with 1 seta. Costal extension 49 μm long.

Legs — Spur of front tibia 30 μm long, spurs of middle tibia 26 μm and 19 μm, of hind tibia 45 μm and 15 μm long. Width at apex of front tibia 38 μm, of middle tibia 38 μm, of hind tibia 49 μm. Comb of hind tibia of 11 setae 19–41 μm long. Sensilla chaetica 3 at 0.19 to 0.30 of ta1 of middle leg, 8 at 0.13 to 0.36 of ta1 of hind leg. Lengths (micrometers) and proportions of legs:
Abdomen — Number of setae on tergites II–VIII as: 9, 12, 11, 9, 8, 8, 11. Number of setae on sternites IV–VIII as: 5, 4, 6, 5, 14.

Genitalia (Fig. 2A–C) — Gonocoxite with 4 long and 2 shorter setae. Tergite IX with 14 setae. Cercus 139 µm long. Seminal capsule 94 µm long, including 26 µm long neck; 56 µm wide. Notum 128 long.
A redefinition of Acamptocladius Brandin, 1956

**Pupa**
Not known.

**Larva.**
Not known with certainty (see p. 31).

**Distribution**

Acamptocladius submontanus (Edw.) is known from the type-locality in Scotland and from Sweden (Lappland & Jämtland) (Brandin 1956: 163).

**Acamptocladius reissi** n.sp.
Figs. 1A–C, 2D–E, 3, 4.


**Diagnosis:** The imago is characterized by having a wing length of about 1.0–1.2 mm, costa not extended, a male AR of about 0.8–0.9, about 4–6 dorsocentrals, anal point triangular without apical point, phallapodeme about same length as transverse sternapodeme, weakly developed double inferior volsella, and female with about 10 subequal setae on gonocoxite IX.

**Male imago** (n=2 except where stated in parentheses)

Total length 2.05–2.59, 2.28 mm (4) long. Wing length 1.01–1.18 mm. Total length/wing length 1.85–2.02. Wing length/length of profemur 2.84–2.97.

**Head** — AR 0.82–0.89, 0.86 (3). Last flagellomere 323–345, 331 μm (3) long. Temporal setae 3 (3), including 2 (3) outer verticals, and 1 (3) postorbitals. Clypeus with 12–14 setae. Tentorium 116–128 μm long, 19 μm (1) wide. Palp lengths (μm, n=3): 23–26, 24; 30–39, 35; 47–64, 55; 56–64, 60; 81–94, 86.

**Thorax** (Fig. 1B) — Antepronotum with 5 (1) setae. Dorsocentrals 4–6, 5 (4); prealars 3. Scutellum with 2 setae.

**Wing** (Fig. 1A) — VR 1.26 (1). Brachium with 1 seta, other veins bare. Costa apparently not extended.

**Legs** — Spur of front tibia 23–24 μm long; spurs of middle tibia 17–23 μm and 11–15 μm, of hind tibia 41 μm and 17–19 μm. Width at apex of front tibia 26 μm, of middle tibia 26–28 μm, of hind tibia 34 μm. Sensilla chaetica 3–4, 4 (3) at 0.11–0.20 to 0.29–0.47 of ta₅ of hind leg. Tarsal pseudosparser present on ta₄–ta₅ of all legs. Lengths (μm) and proportions of legs:

<table>
<thead>
<tr>
<th></th>
<th>fe</th>
<th>ti</th>
<th>ta₁</th>
<th>ta₂</th>
<th>ta₃</th>
<th>ta₄</th>
<th>ta₅</th>
<th>LR</th>
<th>BV</th>
<th>SV</th>
<th>BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>p₁</td>
<td>340–416</td>
<td>425–510</td>
<td>227–274</td>
<td>132–161</td>
<td>99–118</td>
<td>61–76</td>
<td>57</td>
<td>0.53–0.54</td>
<td>2.84–2.94</td>
<td>3.30</td>
<td>2.6–2.7</td>
</tr>
<tr>
<td>p₃</td>
<td>369–425</td>
<td>435–524</td>
<td>228–236</td>
<td>128–156</td>
<td>109–132</td>
<td>57–76</td>
<td>57</td>
<td>0.54–0.55</td>
<td>2.94–2.97</td>
<td>3.20–3.40</td>
<td>3.8–4.6</td>
</tr>
</tbody>
</table>

**Hypopygium** (Fig. 1C) — Ninth tergum with 8–9, 9 (4) setae on margins of anal point; laterosternite IX with 5–6, 6 (4) setae. Phallapodeme 66–76, 72 μm (4) long. Transverse sternapodeme 62–76, 67 μm (4) long. Gonocoxite 161–180, 168 μm (4) long; with weak, double inferior volsella. Gonostylus with 12–13, 12 μm (3) long apical spine. HR 2.00–2.27, 2.12 (4); HV 2.63–3.01, 2.87 (4).

**Female imago** (n=1, mature pupa)

Total length about 1.9 mm.

**Head** — Lengths of 3 ultimate flagellomeres (μm): 30, 34, 105. Last palpal segment 79 μm long.


**Legs** — Sensilla chaetica 2 on ta₁ of middle leg, present on ta₄ of hind leg.

**Genitalia** (Fig. 2A–C) — Gonocoxite with about 10 subequal setae. Cercus 83 μm long. Seminal capsule 60 μm long, including 19 μm long neck; 49 μm wide. Notum 98 μm long.

Other details not observable.

**Pupa** (n=10)

Length 2.2–3.1, 2.6 mm. Cephalothorax and abdominal segments evenly, but weakly, subfuscous.
Cephalothorax — Thoracic horn (Fig. 3C) 105–143, 120 μm long; 31–42, 36 μm wide, subfuscous, with scattered weak spines. Anterior precorneal seta 31–63 μm long, median 18–47 μm long, posterior 13–16 μm long. Frontal apotome (Fig. 3D) with 18–34, 28 μm long frontal setae on small tubercles.

Abdomen (Fig. 3A, B) — Shagreen and chaetotaxy as in figure. Anal lobe 169–241, 210 μm long; anal macrosetae 178–294, 213 μm long. Pedes spurii A present on sternites IV–VII, strong pedes spurii B present on segment II.

Length of longest L seta on segment VIII, 132–159, 142 μm.

Fourth instar larva (n=10)

Body length 2.8–3.4, 3.0 mm; head capsule length 265–344, 295 μm. Body colour (after alcohol preservation) green with intersegmental areas showing purple or blue pigmentation; head capsule pale brown. Eye spot single.

Head — Antenna (Fig. 4B) 5 segmented, the basal 2 segments brown, the apical 3 weakly sclerotized and difficult to differentiate; lengths (in μm): 80–95, 90; 14–21, 17.5; 8–13, 10.1; 6–9, 8.0; 5–6, 5.8. AR 1.68–1.90, 1.78. Antennal blade 35–53, 44 μm long. Ring organ 53–66, 61 μm from base of antenna. Labrum as in Fig. 4D. Premandible with 3 apical, 1 inner and 1 outer teeth; 29–34, 33 μm long. Mandible (Fig. 4C) 75–92, 84 μm long. Seta subdentalis 13–18, 16 μm long. Maxilla as in Fig. 4F. Mentum (Fig. 4A) 106–114, 111 μm wide between posterior margins of dorsegmentum. Ventromentum overlapping dorsegmentum and bearing 3 small median teeth. Dorsegmentum with 13–18 small teeth on each lateral plate.

Abdomen (Fig. 4E) — Anterior parapods with simple, pale brown claws. Pro cercus darkened; 53–64, 58 μm high, 21–48, 36 μm wide, 6 or 7 anal setae of length 275–399, 343 μm, and 2 weak lateral setae. Supraanal setae strong, 164–249, 208 long. Anal tubules ovoid, 199–239, 219 μm long; subequal to, or longer than posterior parapods. Posterior parapods 132–222, 181 μm long; bearing simple, brown claws.

Distribution

Acamptocladius reissi is known only from the type locality in southern Germany.

Acamptocladius sp. indet. (? submontanus (Edw.))

Fourth instar larva (n=4) (not figured)

Body length 2.4–3.6, 2.9 mm, head capsule length 315–346, 335 μm. Body colour (slide mounted, uncleared) green without purple pigment, head capsule pale brown, eye spot single.

Head — Basal antennal 2 segments brown, apical 3 weakly sclerotized and difficult to differentiate, lengths (in μm) 80–100, 93; 14–21,
A redefinition of Acamptocladius Brandin, 1956

Material examined

England: Dorset, nr Furzebrook, pools at N.G.R. 30/926 836 and 30/935 833 (Blue Pool) iii/iv. 1979, leg. L. Barnes (4 larvae). (British Museum (Natural History))

Comments

These unreaed larvae differ from those of A. reissi in the short, tapering anal tubules, the greater mandibular length and the greater combined lengths of antennal segments 3–5. Although the identity is uncertain these may be the larvae of A. submontanus.

Ecology of Acamptocladius spp.

Adults of A. submontanus have been collected from the shores of upland moorland lakes and from Sphagnum at the margin of a polyhumic lake (Edwards 1932; Brandin 1956). Larvae of A. dentolatens were collected from colonies of the blue-green alga Aphanocapsa sp. in a Canadian lake (Sæther 1971). A. reissi has been reared from larvae found in a peat pool and larval gut contents showed many peat particles. Undetermined Acamptocladius larvae have been taken from four Dorset pools. All sites are ball clay pools on a sandy bed, with acidity of pH 4.0–6.3 associated with high SO₄ levels. The water is clear with no phenolic colouration. Acamptocladius larvae form up to 17% of the Chironomidae in vegetation (including Sphagnum cuspidatum) samples (Barnes pers. comm. 1980).

Presumably first instar larvae of a species presumed to belong to a genus near Acamptocladius (as Phycoidea) or a redefined Acamptocladius have been found between the demibranchs of Unionidae from New Brunswick, Canada (Gordon, Swan & Paterson 1978) and Louisiana, USA (Roback 1979). Although occurring in high numbers later instars have been impossible to find and the larvae must be leaving the bivalve to pass further instars elsewhere.

Acknowledgements: The authors wish to thank Dr. F. Reiss, Zoologische Staatssammlung, Munich, for permission to describe A. reissi and permission to retain some material in their collection. We are also grateful to Ms. Laurie Barnes, University of Exeter for permission to
include descriptions of specimens collected by her and for information on the locality ahead of completion of her PhD thesis. We wish to thank Mrs. Unni Sæther for the illustrations and for typing the manuscript.

References


Manuscript received January 1981.