Zootaxa 508: 1–12 (2004)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

508

Three new species of *Orthocladius* subgenus *Eudactylocladius* (Diptera: Chironomidae) from Norway

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Abstract

The male imagines of *Orthocladius* (*Eudactylocladius*) *priomixtus* sp. n, *O.* (*E.*) *schnelli* sp. n. and *O.* (*E.*) *musester* sp. n. and the tentatively associated pupa of *O.* (*E.*) *priomixtus* are described. The male imago of *O.* (*E.*) *priomixtus* differs from the closely related *O.* (*E.*) *subletteorum* Cranston by having a preapical projection of the gonostylus and more numerous setae on the squama. The tentatively associated pupa has oval spine patches on tergite II and absent or reduced pedes spurii B as the tentatively associated *O.* (*E.*) *subletteorum*, but lacks any pleural spinules. *O.* (*E.*) *schnelli* has strong and dense microtrichiae on the gonostylus and a well sclerotised anal point. *O.* (*E.*) *musester* resembles *O.* (*E.*) *fuscimanus* (Kieffer), but has a more developed inferior volsella of the gonocoxite and a conspicuously broad cibarial pump. A revised key to male imagines of the subgenus is given.

Key words: *Orthocladius*, *Eudactylocladius*, new species, key, Orthocladiinae, Chironomidae

Introduction

The subgenus *Eudactylocladius* Thienemann of the genus *Orthocladius* v. d. Wulp often dominates the fauna of thin water films in temperate regions. In arctic regions the larvae occur in inundated or damp soil and lake margins. Other species in temperate Holarctic regions and montane Afrotropical regions are truly lotic in streams.

Cranston (1984, 1999) revised the subgenus. He examined the types of *Chironomus mixtus* Holmgren, 1869 previously regarded as an *Eudactylocladius*, and found that the female holotype belonged to an undetermined species of the subgenus *Orthocladius.* Some of the Nearctic specimens previously misidentified as *O.* (*E.*) *mixtus* were redescribed as a new species, *Orthocladius* (*Eudactylocladius*) *subletteorum* by Cranston (1999: 291).

According to Cranston (1999) other Nearctic and some Scandinavian specimens referred to *O.* (*E.*) *mixtus* belong to *O.* (*E.*) *gelidorum* (Kieffer), while he regarded the

Accepted by A. Whittington: 30 Apr. 2004; published: 7 May 2004

identity of the many other Palaearctic specimens identified as *O*. (*E*.) *mixtus* as beyond the scope of his treatment of the Nearctic species of the subgenus. Most of the specimens in the collection of the Museum of Zoology, University of Bergen, previously identified as *O*. (*E*.) *mixtus* do indeed belong to *O*. (*E*.) *gelidorum*. However, two male imagines and one pupal exuviae from the mountains of Western Norway keys close to *O*. (*E*.) *subletteorum*, and one male imago from the northernmost lake on Spitzbergen close to *O*. (*E*.) *dubitatus* Johannsen. These specimens are described here together with a new species close to *O*. (*E*.) *fuscimanus* (Kieffer).

Methods and terminology

The general terminology follows Sæther (1980). In the figures of the male genitalia the dorsal view is shown to the left, the ventral aspect and apodeme to the right. The holotypes of the new species are deposited at the Museum of Zoology, Department of Zoology, University of Bergen, Norway (ZMBN).

***Orthocladius* (*Eudactylocladius*) *priomixtus* sp. n.**

(Figs 1, 5–8, 12)

Orthocladius (*Eudactylocladius*) *mixtus*; Halvorsen et al, 1982: 119, *pro parte*, not Holmgren: 1869: 45.
? *Spaniotoma* (*Orthocladius*) *mixtus*; Edwards, 1935: 538 not Holmgren: 1869: 45.
? *Orthocladius* (*Dactylocladius*) ? *microcomus*; Andersen, 1937: 67 not Kieffer 1922: 16.
? *Eudactylocladius mixtus*; Thienemann, 1941: 225 not Holmgren: 1869: 45.
? *Orthocladius* (*Eudactylocladius*) *mixtus*; Brundin, 1956: 98 not Holmgren: 1869: 45.

Type material

Holotype ♂, NORWAY: Hordaland, Evanger, Ekse, Malaise trap, 10–18 viii 1976, T. Andersen (ZMBN Type No. 394). Paratype: NORWAY: Luster, Jostedal, near Viva, 1 ♂, 29 vii 1987, G. A. Halvorsen & O. A. Sæther.

Other material: NORWAY: Sogn & Fjordane, Luster, Jostedal, Fåbergstølsgrandane, 1 pupal exuviae 25 vii 1986, Ø. A. Schnell (ZMBN).

Etymology

From Latin, *prior, prius*, former, and *mixtus*, mix, mingle, referring to the former position of the species in *O*. (*E*.) *mixtus* and the confused status of several species within the subgenus.

Diagnostic characters

The male imago is separable from the other species of the subgenus except *O*. (*E*.)

subletteorum by having inner margin of gonocoxite with strong dense microtrichiae, commencing about one fourth gonocoxite length posterior of gonocoxite base, combined with weakly delimited superior volsella, and no sensilla chaetica on the legs. It differs from *O.* (*E.*) *subletteorum* by having a preapical, triangular projection of the gonostylus. The tentatively associated pupa differs from the tentative pupa of *O.* (*E.*) *subletteorum* by having no pleural spinules. It has all three macrosetae equal in size, pedes spurii B at most indicated on segment II, pedes spurii A present only on sternite VI, tergites II–VII each with paired median spine patches, and tergites II–VIII with posterior rows of spines.

Nomenclatorial notes: Edwards in Thienemann (1941) suggested that *Orthocladius novae-Semliae* Kieffer, 1922: 14, and *Dactylocladius microcomus* Kieffer, 1922: 16, could be synonyms of *O.* (*E.*) *mixtus*. *O. novaesemliae* is lost and must be regarded as a *nomen dubium*. The type of *Dactylocladius microcomus* has been examined. It is a *Chaetocladius* lacking the abdomen and thus also a *nomen dubium*.

Male imago (n = 2 except when otherwise stated)

Total length 3.64–3.73 mm. Wing length 2.32–2.49 mm. Total length/wing length 1.50–1.57. Wing length/length of profemur 2.80–2.85. Coloration yellowish with blackish brown vittae, lower 2/3 of preepisternum, median anepisternum II, and postnotum.

Head. AR 1.10–1.15. Ultimate flagellomere 510–539 µm long. Temporal setae 11–14, including 4–5 inner verticals, 4–5 outer verticals, and 3–4 postorbitals. Clypeus with 6–12 setae. Cibarial pump, tentorium and stipes as in Fig. 8. Tentorium 154–173 µm long, 41–45 µm wide. Stipes 161–173 µm long, 53–56 µm wide. Palpomere lengths (in µm): 38–41, 53–54, 128–131, 113–120, 165–184.

Thorax. Antepronotum with 5–6 setae. Dorsocentrals 12–14, acrostichals 14, prealars 5. Scutellum with 10–12 setae.

Wing. VR 1.09–1.11. Costal extension 41–56 µm long. R with 7–11 setae, R_1 with 0–3 setae. Squama with 13–20 setae.

Legs**.** Spur of front tibia 64 µm long, spurs of middle tibia 38–45 and 26–30 µm long, of hind tibia 71–75 and 34 µm long. Width at apex of front and middle tibia each 45–49 µm, of hind tibia 53–56 µm. Pseudospurs present on ta_1 and ta_2 of mid and hind leg, 26–38 µm long. Sensilla chaeticae absent. 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	813–888	950–1030	643(1)	387(1)	265(1)	170(1)	123(1)	0.68(1)	2.55(1)	2.74(1)	2.2(1)
p_2	832–907	879–917	378–406	232–255	184–189	118–128	99–109	0.43–0.44	3.30	4.49–4.53	2.6–2.8
p_3	945–964	1008–1115	576–662	331–369	137–156	137–156	123–132	0.54–0.59	2.96–3.10	3.14–3.49	2.9–3.0

Hypopygium (Fig. 1). Tergite IX with 20–27 setae including 8–12 on anal point, laterosternite IX with 6–8 setae. Anal point 68–71 µm long. Phallapodeme (Fig. 12) 66–68

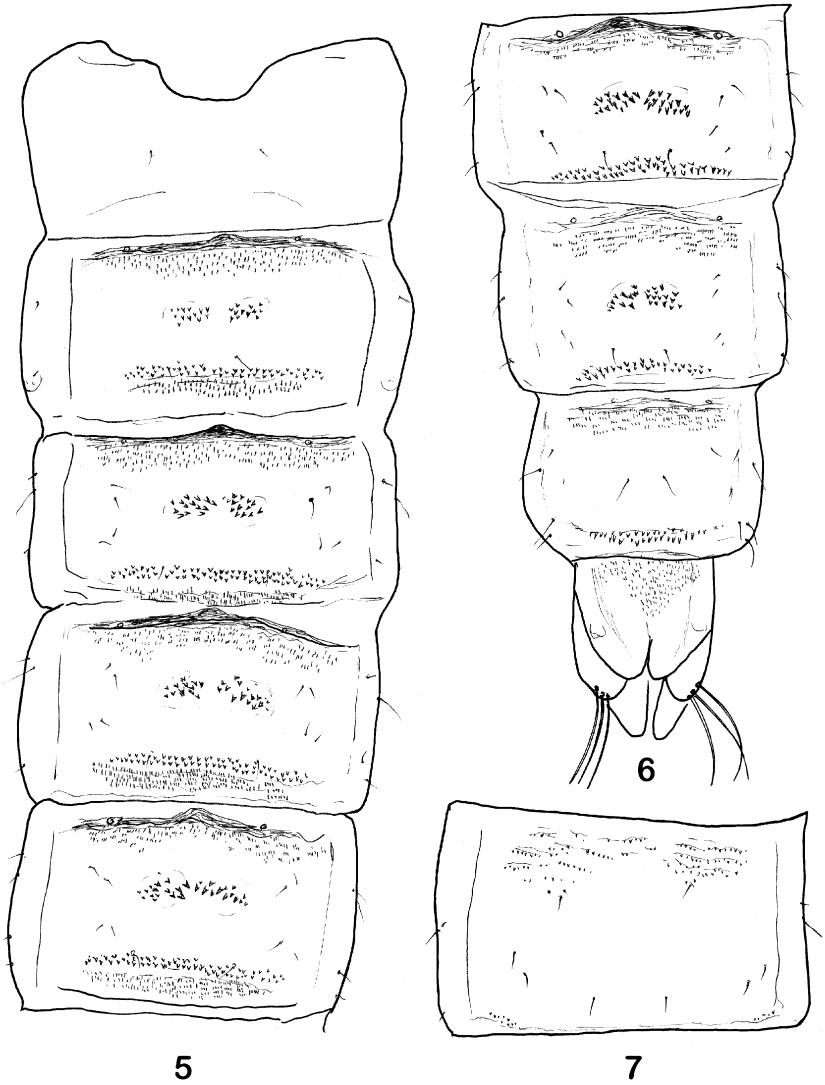
µm long, transverse sternapodeme (Fig. 12) 116–131 µm long, oral projections well developed. Gonocoxite 240–244 µm long. Gonostylus 86–90 µm long, widest near apex, with triangular preapical projection not visible in all views; crista dorsalis apical, bluntly triangular; megaseta 17–19 µm long. HR 2.67–2.83, HV 4.15–4.23.

FIGURES 1–4. *Orthocladius* (*Eudactylocladius*) spp., male imagines, hypopygium, 1: *O.* (*E.*) *priomixtus* sp. n. with variation of gonostylus, 2: *O.* (*E.*) *schnelli* sp. n., 3: *O.* (*E.*) *musester* sp. n., 4: *O.* (*E.*) *fuscimanus* (Kieffer).

Pupa (n = 1, tentatively associated)

Total length 4.46 mm. Exuviae pale greyish brown with brownish black apophyses on tergites II–VIII.

Cephalothorax. Frontal setae not measurable. Thoracic horn lost. Precorneal setae respectively 94 µm, 75 µm and 45 µm long. Anterior dorsocentral (Dc_1) 83 µm long; Dc_2, 30 µm, Dc_3 45 µm, and Dc_4 38 µm long. Distances (in µm): Dc_1–Dc_2 203, Dc_2–Dc_3 0, Dc_3–Dc_4 15.

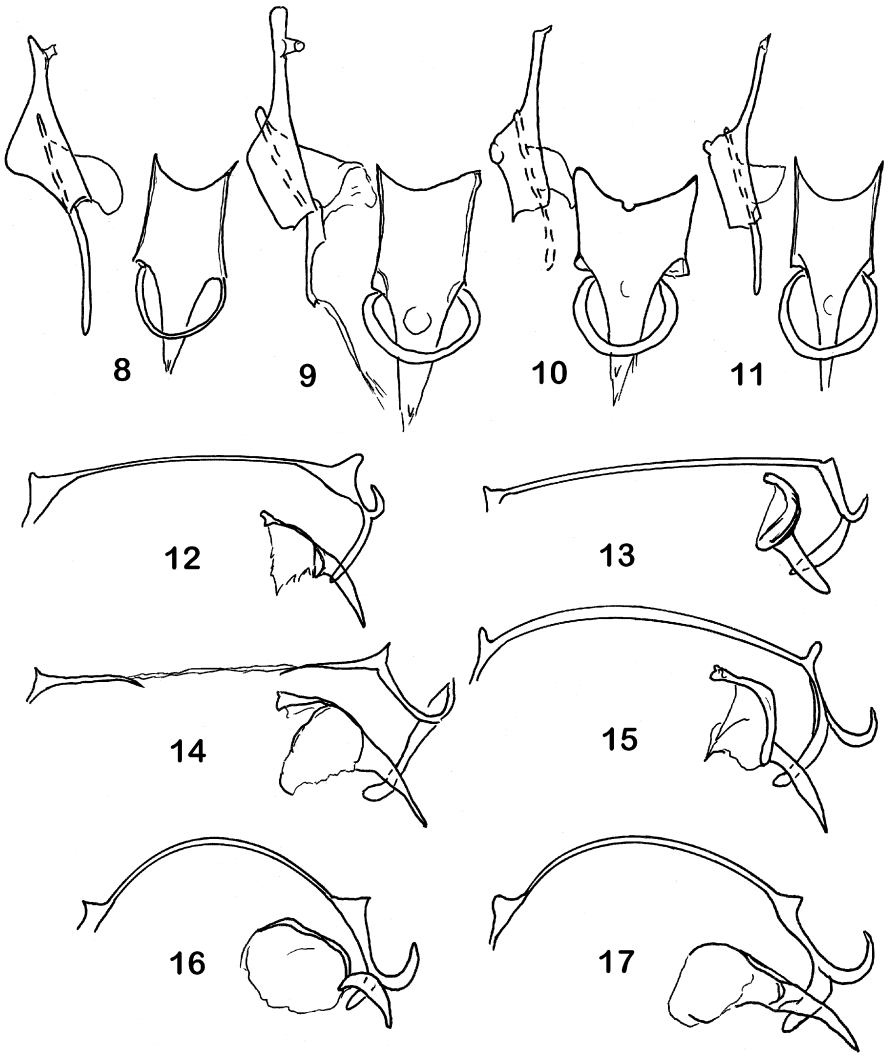


FIGURES 5–7. *Orthocladius* (*Eudactylocladius*) *priomixtus* sp. n., pupa, 5: tergites I–V, 6: tergites VI–IX, 7: sternite VI.

Abdomen (Figs 5–7). Tergites II–VII each with 2 spine patches, each patch with 13 – 22 spines. Longest spine in patches 8 µm long on tergite II, 11 µm on T III, 15 µm on T IV, 19–23 on each of T V–VII. Tergites II–VIII with posterior rows of spines, triple on T II–VII, double on T VIII, 70–76 spines on T II–IV, 84 on T V, 66 on T VI, 52 on T VII, and 39 on T VIII. Longest posterior spine 9–11 µm long on each of T II–IV, 15–19 µm long on

each of T V–VIII. Integuments II/III – V/VI each with 5 rows of anteriorly directed spines with no true caudal hooklets on tergite II. Tergite I without shagreen; tergites II–VIII with strong anterior shagreen not connected to spine patches, IX with anterior and median spinules. Sternites I and IX bare; sternites II–VIII each with sparse anterior group shagreen. Pedes spurii A indicated only on sternite VI (Fig. 7). Pedes spurii B indicated on tergite II only. Longest L seta on segments I–VI at most 56 μm long. Lengths of L_1–L_4 setae on segment VII (in μm) as: 19, 56, 23, 11; on segment VIII: 19, 34, 60, 75.

Anal lobe 281 μm long. Anal macrosetae subequal in length, 191 μm long, 0.68 as long as anal lobe. Male genital sac overreaching anal lobe by 68 μm.



FIGURES 8–17. *Orthocladius* (*Eudactylocladius*) spp., male imagines, 8–11: tentorium, stipes and cibarial pump, 8: *O*. (*E*.) *priomixtus* sp. n., 9: *O*. (*E*.) *schnelli* sp. n., 10: *O*. (*E*.) *musester* sp. n., 11: *O*. (*E*.) *fuscimanus* (Kieffer), 12–17: sternapodeme and phallapodeme, 12: *O*. (*E*.) *priomixtus* sp. n., 13: *O*. (*E*.) *olivaceus* Kieffer, 14: *O*. (*E*.) *schnelli* sp. n., 15: *O*. (*E*.) *gelidorum* (Kieffer), 16: *O*. (*E*.) *fuscimanus* (Kieffer), 17: *O*. (*E*.) *musester* sp. n.

Comments

O. (*E*.) *priomixtus* could conceivably be a form of *O*. (*E*.) *subletteorum*. The differences are slight and mainly consist in the shape of the gonostylus. In *O*. (*E*.) *subletteorum* the gonostylus is broadest about the mid-point and has an apical, strong, rounded crista dorsalis nearly as high as the megaseta, while the gonostylus of the present species is clearly broadest near the apex and has an inner triangular projection and a more triangular and lower crista dorsalis. However, according to B. Bilyj (personal communication) the differences in the shape of the gonostylus may be due to position on the slide preparation. He also found that his specimens had prominent oral projections on the transverse sternapodeme as in *O*. (*E*.) *priomixtus* and different from the drawing of *O*. (*E*.) *subletteorum* in Cranston (1999 fig.1g). *O*. (*E*.) *priomixtus* is slightly larger with a wing length of 2.3–2.4 mm as opposed to 1.8–2.1 mm in *O*. (*E*.) *subletteorum*, the squama has 13–20 setae as opposed to 9–14, and the anal point is 68–71 μm long as opposed to 32–51 μm.

If the tentatively associated pupa is correctly associated the two species have to be different. The pupa also differs from the pupa regarded as belonging to *O*. (*E*.) *mixtus* by Thienemann as it has posterior spine rows also on tergite VIII. This, however, could be individual variation.

Distribution

The species is known with certainty only from the localities mentioned here, three high mountain localities in Western Norway, the two in Jostedal, glacier-fed streams about 2 km apart. Most other records are likely to be of *O*. (*E*.) *gelidorum*. The paratype from Viva have previously been reported as *O*. (*E*.) *grampianus* (Edwards) = *O*. (*E*.) *gelidus* Kieffer by Sæther & Schnell (1988) who also give further details of the Viva locality.

***Orthocladius* (*Eudactylocladius*) *schnelli* sp. n.**

(Figs 2, 9, 14)

Type material

Holotype ♂, NORWAY: Svalbard, Spitzbergen, Vasa Peninsula, Lake Birgervatnet, 79º 48'N, 11º 37'E, 15 viii 1983, Ø. A. Schnell (ZMBN Type No. 395).

Diagnostic characters

The male imago is separable from the other species of the subgenus by having dense microtrichiae on both dorsal and ventral sides of gonostylus, strongly sclerotized anal point with nearly parallel-sided apex, wings greyish clouded with dark squama, ultimate flagellomere more than 650 μm long, gonocoxite with both volsellae weakly developed and no sensilla chaetica on tarsi.

Etymology

Named after the collector of the species.

Male imago (n =1)

Total length 4.50 mm. Wing length 3.17 mm. Total length/wing length 1.42. Wing length/length of profemur 3.13. Coloration dark brown with thoracic markings barely separable from ground colour. Wing pale greyish clouded with squama nearly black.

Head. AR 1.25. Ultimate flagellomere 676 µm long. Temporal setae 17, including 6 inner verticals, 6 outer verticals, and 5 postorbitals. Clypeus with 11 setae. Cibarial pump, tentorium and stipes as in Fig. 9. Tentorium 199 µm long, 49 µm wide. Stipes 184 µm long, 75 µm wide. Palpomere lengths (in µm): 45, 71, 158, 135, 214.

Thorax. Antepronotum with 5 setae. Dorsocentrals 13, acrostichals 14, prealars 5. Scutellum with 14 setae.

Wing. VR 1.07. Costal extension 53 µm long. R with 18 setae, R_1 with 5 setae. Squama with 15 setae.

Legs. Spur of front tibia 79 µm long, spurs of middle tibia 45 and 41 µm long, of hind tibia 86 and 39 µm long. Width at apex of front and middle tibia each 53 µm, of hind tibia 58 µm. Pseudospurs present on ta_1 and ta_2 of mid and hind leg, 34–38 µm long. Sensilla chaeticae absent. 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	1011	1257	879	529	340	222	132	0.70	2.57	2.58	2.5
p_2	1115	1162	543	321	236	142	123	0.47	3.43	4.19	2.6
p_3	1210	1418	813	425	302	170	142	0.57	3.31	3.23	4.5

Hypopygium (Fig. 2). Tergite IX with 18 setae including 2 on anal point, laterosternite IX with 8 setae. Anal point 47 µm long. Phallapodeme (Fig. 14) 94 µm long, transverse sternapodeme (Fig. 14) 143 µm long, oral projections well developed, median portion of transverse sternapodeme very weak. Gonocoxite 326 µm long, with two weak but distinct volsellae, strong microtrichiae starting close to base and reaching to apex of apical lobe. Gonostylus 113 µm long, densely covered with microtrichiae, widest near apex; crista dorsalis apical, truncate; megaseta 19 µm long. HR 2.90, HV 3.98.

Comments

A slightly cloudy wing with squama nearly as dark, is also found in at least some specimens of *O.* (*E.*) *fuscimanus* (Kieffer). The wing of the present species, however, is longer than in any other species examined, and the ultimate antennal segment longer than in other species except *O.* (*E.*) *gelidus*. The strongly sclerotised anal point appear to be unique among the members of the subgenus.

Distribution and ecology

The species is known only from the type locality on Spitzbergen, which is among the northernmost lakes on the archipelago. The only chironomid collected in the profundal zone was *Oliveridia tricornis* (Oliver). Kick samples along the shore yielded larvae of

Diamesa bohemani Goetghebuer, *Diamesa arctica* (Boheman), undetermined *Diamesa*, *Metriocnemus obscuripe*s (Holmgren) and *Oliveridia tricornis*. Adults of *Diamesa hyperborea* Holmgren were collected together with the present species.

***Orthocladius* (*Eudactylocladius*) *musester* sp. n.**
(Figs 3, 10, 17)

Type material

Holotype ♂, NORWAY: Hordaland, Bergen, Museum of Zoology, on the window of the preparation room, 14 vii 1987, Ø. A. Schnell (ZMBN Type No. 396).

Diagnostic characters: The male imago differs from other species of the subgenus except most *O*. (*E*.) *fuscimanus* by having two well defined lobes on the gonocoxite. It differs from *O*. (*E*.) *fuscimanus* by having the inferior volsella (apical lobe) sharply delimited and with weak apical microtrichiae, a broad and short cibarial pump and no sensilla chaetica on tarsi.

Etymology: From Latin, *museum*, and *–ester*, belonging to, referring to the place of collection.

Male imago (n =1)

Total length 3.81 mm. Wing length 2.30 mm. Total length/wing length 1.66. Wing length/length of profemur 2.67. Coloration yellowish with dark brown thoracic markings. Wing pale greyish clouded with squama dark.

Head. AR 1.25. Ultimate flagellomere 605 µm long. Temporal setae 13, including 5 inner verticals, 4 outer verticals, and 4 postorbitals. Clypeus with 13 setae. Cibarial pump (Fig. 10) very broad and short. Tentorium (Fig. 10) 195 µm long, 47 µm wide. Stipes (Fig. 10) 161 µm long, 79 µm wide. Palpomere lengths (in µm): 38, 56, 131, 139, 203.

Thorax. Antepronotum with 3 setae. Dorsocentrals 13, acrostichals 12, prealars 4. Scutellum with 12 setae.

Wing**.** VR 1.09. Costal extension 53 µm long. R with 10 setae, R_1 with 1 seta. Squama with 18 setae.

Legs**.** Spur of front tibia 56 µm long, spurs of middle tibia 30 and 26 µm long, of hind tibia 75 and 34 µm long. Width at apex of front and middle tibia each 45–47 µm, of hind tibia 54 µm. Pseudospurs present on ta_1 and ta_2 of mid and hind leg, 26–30 µm long. Sensilla chaeticae absent. 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	860	1040	765	392	284	184	123	0.74	2.70	2.48	2.1
p_2	888	907	444	246	175	85	90	0.49	3.76	4.04	2.1
p_3	945	1106	652	312	198	113	109	0.59	3.69	3.14	4.0

Hypopygium (Fig. 3). Tergite IX with 20 setae, laterosternite IX with 10 setae. Anal point 68 µm long. Phallapodeme (Fig. 17) 83 µm long; transverse sternapodeme (Fig. 17) semi-circular, 109 µm long, oral projections well developed. Gonocoxite 289 µm long, with two distinct lobes, posterior lobe bluntly triangular with apical microtrichiae. Gonostylus 105 µm long; crista dorsalis apical, truncate; megaseta 15 µm long. HR 2.75, HV 3.63.

Comments

Specimens of this species previously could have been regarded as forms of *O*. (*E*.) *fuscimanus*. A slightly cloudy wing with darker squama also is found in at least some specimens *O*. (*E*.) *fuscimanus* (Kieffer). In specimens *O*. (*E*.) *schnelli*, described above, the wing is darker.

Distribution

The species is known only from the type locality in the Museum of Zoology, University of Bergen.

Comments on other species of the subgenus

O. (*E*.) *fuscimanus* (Kieffer) (Figs 4, 16)

Material examined: NORWAY: Buskerud: Krødsherad, R 7, 11.5 km from Ørgenvika, seepy cliff, 60°11.98'N, 09°37.59'E, 4 larvae, 13 v 2002, R. W. Lichtward. Hordaland: Kvinnherad, Inlet to Vatnastølsvatn, 1 pupal exuviae, 28 viii, 1989, Ø. A. Schnell; Vaksdal, Ekse, 4 ♂, 1 pupal exuviae, 3–26 viii 1976, 28 vii 1988, T. Andersen & Ø. A. Schnell (Halvorsen et al, 1982 as *O*. (*E*.) *obtexens* Brundin). Sogn & Fjordane: Luster, Skuggevatn, 1 ♂, 24 vii 1986, Ø. A. Schnell; Luster, Viva at inlet to small lake, 1 pupal exuviae, 23 vii 1986, Ø. A. Schnell; Jostedal, 1♂, vii 1986, Ø. A. Schnell; Jostedal at Viva, 1 pupal exuviae, G. A. Halvorsen & O. A. Sæther. Møre & Romsdal: Surnadal, Sondrebekken at Mardøladalen, 1♂, pupal exuviae, summer 1991, Ø. A. Schnell (All ZMBN).

O. (*E*.) *fuscimanus* has tentorium, stipes and cibarial pump (Fig. 11) similar to most other members of the subgenus and different from the closely related *O*. (*E*.) *musester.* The sternapodeme and the phallapodeme (Fig. 16), however, are similar in the two species and differ from other members of the subgenus.

Cranston (1984) states that there is no evidence of paired spine patches on tergite II, although there may be weak shagreen patches at the same site. This is correct for some of the pupae, while others have weak spine patches. Also, some pupae have no spines posterior on tergite VIII, while others have some weak posterior spines.

According to Cranston (1999) the pedes spurii A are equally strongly developed on sternites IV, V and VI. In the present pupae, however, the pedes spurii A are nearly as extensive on IV and V as on VI, but the spines are much stronger on VI.

O. (*E*.) *gelidorum* (Kieffer) (Fig. 15)

Material examined: NORWAY: Hordaland: Evanger, Ekse, 9 ♂, 3–16 viii 1976, T. Andersen (ZMBN).

The species was reported as *O*. (*E*.) *mixtus* (Holmgren) by Halvorsen et al. (1982).

According to the drawing in Cranston (1999 fig. 1b) there are no oral projections of the transverse sternapodeme. In fact these are rather well developed (Fig. 15) and often rounded rather than pointed as in other species.

O. (*E*.) *olivaceus* Kieffer (Fig. 13)

Material examined: NORWAY: Aust-Agder: Birkenes, Store Hovvatn, 1 mature ♂ pupa, 13–17 vii 1977, Ø. A. Schnell. Møre & Romsdal: Volda, Litlebøvatn, 1 pupal exuviae, 26 vii 1986, Ø. A. Schnell (ZMBN).

The median portion of the phallapodeme (Fig. 13) appears to be shorter and more rounded than in other members of the subgenus.

According to Cranston (1999) the pupae have bare posterior margin of tergite VIII or at most a few small posterior spines. Both of these pupae, particularly the specimen from Volda, have a well developed band of spines on tergite VIII, but otherwise fit the description.

The species is new to Norway.

Key to male imagines of the subgenus *Eudactylocladius*
(Modified from Cranston, 1999)

1. Superior volsella well developed, rounded to right-angled 2
- Superior volsella scarcely to moderately developed 3
2 Inferior volsella well developed, bluntly triangular; dorsal part of cibarial pump wider than long; no sensilla chaetica on mid leg; Palaearctic ..... *O*. (*E*.) *musester* sp. n.
- Inferior volsella weakly indicated to non-existent; dorsal part of cibarial pump not as wide as long; sensilla chaeticae present on mid leg; Palaearctic ..... *O*. (*E*.) *fuscimanus* (Kieffer)
3. Inner margin of gonocoxite with strong dense setae, commencing some distance posterior of gonocoxite base, associated with weakly delimited superior volsella 4
- Inner margin of gonocoxite with finer, less dense, setae, commencing closer to gonocoxite base, anterior to sometimes moderately indicated superior volsella 5
4. Gonostylus without inner projection, squama with 9–14 setae; Nearctic ..... *O*. (*E*.) *subletteorum* Cranston
- Gonostylus with inner, preapical, triangular projection; squama with 13–20 setae; Palaearctic ..... *O*. (*E*.) *priomixtus* sp. n.
5. Superior volsella moderately developed, angular; anal point strong, but not strongly sclerotised, greater than 50 µm long; ultimate flagellomere at least 500 µm long; Holarctic ..... *O*. (*E*.) *gelidus* Kieffer
- Superior volsella scarcely developed; anal point weak to moderately developed or strong and sclerotised, usually less than 50 µm long; ultimate flagellomere often less than 500 µm long . 6
6. Anal point strong, well sclerotised; sensilla chaeticae of legs absent; Svalbard .....

..... *O*. (*E*.) *schnelli* sp. n.

- Anal point sometimes very weak to absent, never strongly sclerotised; sensilla chaeticae probably always present on mid and hind legs 7

7. Gonostylus with microtrichiae on dorsal surface strong and dense, anal point sometimes very weak to absent; Nearctic ..... *O*. (*E*.) *dubitatus* Johannsen

- Gonostylus with microtrichiae on dorsal surface fine and sparse, anal point well developed .. 8

8. Gonocoxite with both volsellae distinct, particularly the superior; Holarctic .... *O*. (*E*.) *gelidorum* (Kieffer)

- Gonocoxite without differentiated volsellae, just a gently rounded contour; Holarctic .... *O*. (*E*.) *olivaceus* Kieffer

Acknowledgements

I am grateful to Øyvind A. Schnell, Bergen, Norway, for some of the material of the new species, and information about the localities; and to Bohdan Bilyj, Etobicoke, Canada, for helpful comments on the manuscript.

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