

## A new subgenus and new species of *Orthocladius* van der Wulp, with a phylogenetic evaluation of the validity of the subgenera of the genus (Diptera: Chironomidae)

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### Abstract

A new subgenus, *Mesorthocladius*, of the genus *Orthocladius* v. d. Wulp is erected and diagnoses are provided for all stages and both sexes. *Orthocladius (Mesorthocladius) lamellatus* sp. n. and *O. (Mesorthocladius) nimidens* sp. n. are described in both sexes and all stages. *Orthocladius (Euorthocladius) annellae* sp. n. is described in both sexes and the pupa. The females of *O. (Euorthocladius) rivicola* Kieffer, *O. (Euorthocladius) ashei* Söpnis, and *O. (Orthocladius) dentifer* Brundin

are described for the first time. The larva of *O. (Orthocladius) nitidoscutellatus* Lundström (syn. *Orthocladius trigonolabis* Edwards) is described for the first time. A parsimony analysis of all species of *Orthocladius* with known pupae and male imagines is performed. The subgenera *Eudactylocladius* Thienemann and *Euorthocladius* Thienemann are always monophyletic, while *Symposiocladius* Cranston is paraphyletic before successive reweighting, but monophyletic after; *Mesorthocladius* is monophyletic before reweighting, but paraphyletic after; and *Orthocladius* s. str. is polyphyletic before reweighting and monophyletic after. Keys to subgenera for both sexes and all stages are given.

**Key words:** *Orthocladius* subgenera, *Mesorthocladius* new subgenus, *Euorthocladius*, new species, keys, phylogeny, Chironomidae

## Introduction

Larvae of *Orthocladius* van der Wulp inhabit all types of flowing water. In addition, representatives are found in lakes, ponds, swamps, thermal waters, hygropetric rock faces, and moist soil, and one species, *O. (Symposiocladius) lignicola* (Kieffer in Potthast 1915) mines wood. The genus is recorded from all zoogeographical regions except Antarctica, but with few exceptions the records outside of the Holarctic Region are based on misidentifications. However, in the Holarctic Region the genus is widespread and common.

The genus presently is divided into five subgenera, *Eudactylocladius* Thienemann, *Pogonocladius* Brundin, *Symposiocladius* Cranston, *Euorthocladius* Thienemann, and *Orthocladius* s. str. *Pogonocladius* is monotypic, whereas *Eudactylocladius* undoubtedly is monophyletic with several autapomorphies. However, *Euorthocladius*, as defined by Soponis (1990), may not be monophyletic, and *Orthocladius* s. str. is unlikely to be monophyletic. It is not possible to find a single synapomorphy combining all species of the nominal subgenus that is not present in some species in one of the other subgenera.

Michael J. Bolton, Columbus, Ohio, sent me material containing all stages and both sexes of two new species of *Orthocladius*. The pupae of both will key to *Orthocladius* s. str. as presently defined, while the larvae of both key to *Euorthocladius*. One species has a male of the *Euorthocladius* type and a female of the *Eudactylocladius* type, whereas the other species keys to *Orthocladius* s. str. as presently defined in both sexes. While comparing these two new species with specimens of *Euorthocladius* from our collection, it was discovered that some specimens from the Northwest Territories identified as *O. rivicola*, in fact belonged to a closely related new species.

## Methods and terminology

Some of the material is mounted on slides in Euparal, the rest in Canada balsam, following the procedure outlined by Sæther (1969: 1).