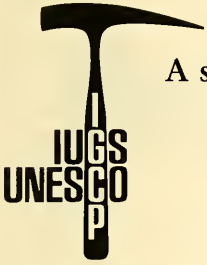


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# A subfossil record of the presumed larva of *Corynocera oliveri* Lindeberg from the Lobsigensee (Swiss Plateau). Studies in the Late-Quaternary of Lobsigensee 8.

(Diptera, Chironomidae)

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## Abstract

Having some morphological features in common with *Corynocera ambigua* Zetterstedt and occurring simultaneously with subfossil male hypopygia of *C. oliveri* Lindeberg, a subfossil Tanytarsini larva from late glacial sediments of the Lobsigensee (Swiss Plateau) is presumed to belong to *Corynocera oliveri*. *C. oliveri* and *C. ambigua* coexisted in the Lobsigensee during the Oldest Dryas period until about 13 000 B. P. This is the first record of both species from the alpine region.

## Introduction

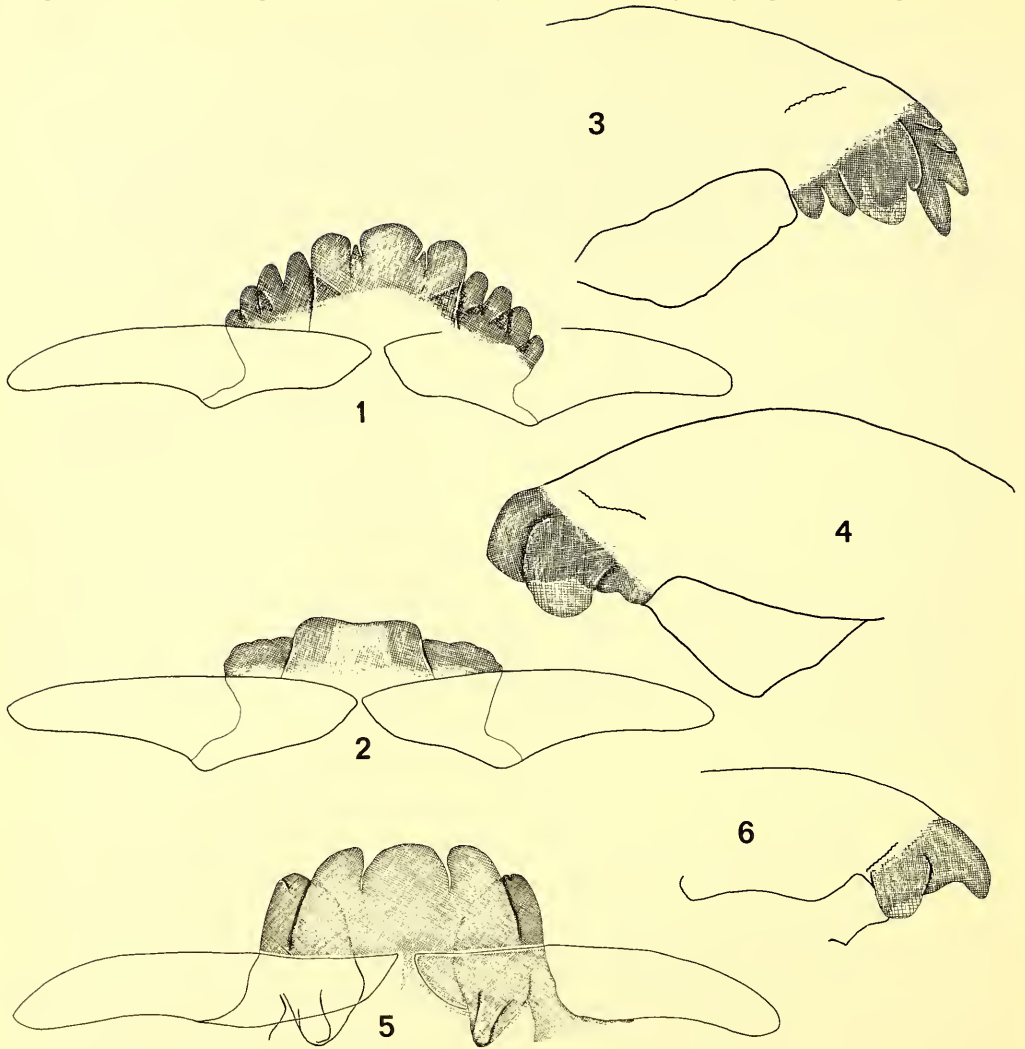
The Lobsigensee is a primary reference site in the Swiss contribution to the International Geological Correlation Programme (IGCP) 158 B (BERGLUND 1979). It is a small (2 ha), shallow (2.5 m) lake about 15 km northwest of Bern (Swiss Plateau, 514 m asl) from which a series of sediment profiles have been obtained. The lowermost layers were from Oldest Dryas (AMANN & TOBOLSKI 1983).

In the late glacial layers from the centre of the recent lake (profile LQI 120 a), as well as from the littoral zone of an earlier period of lake development (LQI 150 a+b), head capsules of Tanytarsini larvae with some distinctive morphological characteristics were found. In the same layers male hypopygia of adult specimens identified as *Corynocera oliveri* Lindeberg by Dr. REISS (München) frequently occurred (HOFMANN 1983). REISS (pers. comm.) also agreed with the suggestion that the Tanytarsini head capsules in question belong to this species, the larva of which was until now unknown.

## Description of the subfossil larva and discussion

This conclusion is not simply deduced from the co-occurrence of larval and adult remains, but also from the fact that the larva shares some morphological features with the second species of the genus *Corynocera*, *C. ambigua* Zetterstedt (HIRVENOJA 1961).

The mentum of the subfossil specimens (Fig. 1) is of the Tanytarsini type, having one middle tooth and five pairs of side teeth and slender mental plates. However, the middle tooth and the first side teeth form a unit as a distal-ventral plate. The second lateral teeth are not beside the first laterals but dorsal to them. Similarly, each of the following lateral teeth is dorsal to its median neighbour. Hence, the mentum is not plain but the teeth form a bow. This arrangement of the mental teeth corresponds with the



*Corynocera oliveri* Lindeberg, Lobsigensee, profile LQI 120a.

Fig. 1: subfossil mentum. Fig. 2: subfossil mentum, worn down. Fig. 3: subfossil mandible. Fig. 4: subfossil mandible, worn down.

*Corynocera ambigua* Zetterstedt, Schöhsee, profile I.

Fig. 5: subfossil mentum. Fig. 6: subfossil mandible.

(All figures approximately the same scale.)

mentum of *Corynocera ambigua*. In the latter species, however, the number of lateral teeth is reduced. Most of the subfossil specimens were heavily worn and resemble the lower mentum in Fig. 2.

The mandible (Fig. 3) which generally resembles a *Tanytarsini* mandible, is distinctive because of the three dorsal teeth distal to the apical tooth, and in particular because of a large plate on the dorsal side of the mandible. This plate has an indentation in its distal side and overlaps the first lateral tooth and a part of the second lateral one. Most of the subfossil mandibles were also deformed by use. In such specimens virtually none of the teeth are discernible except the plate on the dorsal side (Fig. 4).

A re-examination of *Corynocera ambigua* mandibles based on subfossil material from the Schöhsee (HOFMANN 1971) showed that in this species there is also a distinct plate on the dorsal side (Fig. 5, 6). This was not figured by ANDERSEN (1943) and HIRVENOJA (1961) and was distinguishable only in particularly well preserved specimens in which the teeth had not worn down.

Both species thus exhibit a dorsal plate in the distal part of the mandible. Such additional teeth or plates on the dorsal surface also occur in other Tanytarsino taxa, for instance *Tanytarsus radens* Krüger (KRÜGER 1944), *Tanytarsus gr. lugens*, and *Tanytarsus* sp. C (HOFMANN 1971).

Further details of the proximal part of the mandible were not considered because they are difficult to discern in the subfossil material. This is also true for other parts of the head capsule such as the premandible, hypopharynx, maxilla, and antenna.

The morphological characters of mentum and mandible clearly indicate a distinct type of a Tanytarsini larva, but with some relationship to *Corynocera ambigua*. With respect to the mentum, both *Corynocera* species correspond in its tripartite structure, unique within the Tanytarsini. The distal part of the mandible bears a plate on its dorsal surface in both taxa. While the mandible of *C. ambigua* is characterized by a drastic reduction in the number of teeth (as compared with a "normal" Tanytarsini mandible), in *C. oliveri* the distal part of the mandible is very distinctive due to the occurrence of additional teeth.

To summarize, there is some indication that the Tanytarsini larva under discussion belongs to the genus *Corynocera*. In contrast to the other Tanytarsini taxa, there are great morphological differences in the larval stage between species of the genus *Corynocera*. LINDBERG (1970) also mentioned that the morphological differences between the adults of *C. ambigua* and *C. oliveri* are exceptionally large compared with the other Tanytarsini.

It should be mentioned that the first description of the larva of both *Corynocera* species was based on subfossil material (ANDERSEN 1943, sub *Dryadotanytarsus edentulus*).

Until now *Corynocera oliveri* was known chiefly from north Scandinavia (LINDBERG 1970, FITTKAU & REISS 1978). Recently it has been found as a frequent species throughout a sediment core from Greenland (HOFMANN, unpubl. data). The subfossil finding from the Lobsigensee is the first record from the alpine region. In this lake the species coexisted with *C. ambigua* during the Oldest Dryas period. Previously *Corynocera ambigua* has been considered as a northern species (BRUNDIN 1949) as it had not been recorded from the alpine region (FITTKAU & REISS 1978). This subfossil material indicates that both species had an arctic-alpine distribution during late glacial times. In the Lobsigensee they disappeared simultaneously at the end of the Oldest Dryas, i. e. as early as 13 000 B. P. (approx.) (HOFMANN 1983). However, the possibility that the species still occur in the alpine region cannot be excluded. They may have been overlooked because of their particular swarming behaviour (LINDBERG 1970) which makes samples of the adults difficult.

### Acknowledgements

I wish to thank Dr. Brigitta Ammann (Bern) for the stimulating cooperation in the Lobsigensee project. Many thanks are due to Dr. F. Reiss (München) for identification of the subfossil hypopygia and for his critical reading of the manuscript and Dr. Eileen Cox (Plön) for her revision of the English text.

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