

Macrozoobenthos of Lake Verevi

Henn Timm^{1,*} & Tõnu Möls²

¹Estonian Agricultural University, Institute of Zoology and Botany, Võrtsjärv Limnological Station, 61101 Tartu County, Estonia

²Estonian Agricultural University, Institute of Zoology and Botany, 51014 Tartu, Estonia

(* Author for correspondence: E-mail: htimmm@zbi.ee)

Key words: macrozoobenthos, lake, stratification, Estonia

Abstract

An overview on studies of macrozoobenthos in the small, hard-water, stratified and hypertrophic Lake Verevi (South-Eastern Estonia) is given. The list of macroinvertebrates comprises at least 105 taxa. In the open water habitats, the biomass and abundance of macrozoobenthos (except the phantom midge *Chaoborus flavicans*) was rather constant beginning from the epilimnion up to the upper hypolimnion (depth 2–4 m), but very low in the lower hypolimnion (depth 6 m), which was inhabited mainly by *Chaoborus*. Comparison with long-term reference data from other Estonian lakes, belonging to similar limnological types, indicated that the total biomass and abundance (without *Chaoborus*) in the profundal of Verevi were very low.

Introduction

The hard-water, stratified and hypertrophic Lake Verevi (area 12.6 ha, maximum depth 11 m) is one of the best-studied freshwater bodies in Estonia (Mäemets, 1977; Timm, 1991; Ott & Kõiv, 1999). The first samples of macrozoobenthos were collected from open water by the hydrobiological staff of the Institute of Zoology and Botany (IZB) of the former Academy of Sciences in 1957, in order to give a general description of the lake. The next fieldwork of IZB, in which similar sampling techniques were used, followed in 1984 and 1988. The results of earlier studies are presented in the book “State of Lake Verevi” (Timm, 1991). In 1991, IZB conducted an all-year-round bottom-sampling series, accompanied with hydrochemical and other hydrobiological works. In 1996 and 1998, macroinvertebrates of the outer littoral were studied using handnets, the results being published in Timm et al. (1999). During 1998–2001, a new study in open-water areas was conducted, in order to estimate the relationships between macrozoobenthos and water stratification (Table 1).

In an other paper (Timm et al., 2001), we studied whether and how summer thermal stratification determines the taxonomical composition and amount of macrozoobenthos in several small stratified Estonian lakes, among them in Lake Verevi. In this work, a more thorough analysis of the influence of stratification on macrozoobenthos in Lake Verevi is given. A general description of macroinvertebrates of Lake Verevi is presented. On the basis of data of the years 1957–1996, temporal changes in macrozoobenthos are estimated. The biomass and abundance of macrozoobenthos of L. Verevi is compared with that of 90 reference lakes in Estonia.

Materials and methods

Qualitative samples were collected with a triangular sweepnet (edge length 12.5 cm, mesh size 0.3 mm, rod length 1 m) in May and July 1996 as well as in July 1998. Sampling sites were distributed along the shoreline; each time three samples were taken (Fig. 1). When sampling macrophytes, stable patches of *Carex* (living or dead) were

Table 1. Number of samples of macroinvertebrates taken from Lake Verevi in the years 1957–2001

Year	Quantitative	Qualitative	Sampling time
1957	12		Summer
1984	12		Summer
1988	12		Summer
1991	60		All year round
1996		6	Spring and Summer
1998	15	3	Summer
1999	15		Summer
2000	80		Spring to autumn
2001	20		Summer
Total	226	9	

preferred to sites with thick round stems of *Phragmites* and *Typha* or temporary plants. Three to four specimens from each easily identifiable taxon as well as up to 10 specimens of other taxa

were fixed in 70% ethanol *in situ*. Sampling was continued until no new taxa were found.

Quantitative samples were taken from soft unvegetated bottoms in July–August, 1998, July–August, 1999; May, June, August and October, 2000; and August, 2001 (Fig. 1).

Sampling was arranged by zones in the following order:

(1) Sampling depth corresponding to: epilimnion, near the metalimnion's upper boundary; (2) the middle part of metalimnion; (3) the upper hypolimnion, near the metalimnion's lower boundary; (4) the lower (deeper) part of hypolimnion (only in 2000 and 2001). Although the depth of the lake extends to 11 m, samples of zoobenthos were not regularly taken from the very limited deepest region. In 1998, in each case, the positions of the metalimnion and oxycline in the water column were established before samples were taken by the team of hydrochemists of the same project. In 1999–2001, the sampling depths

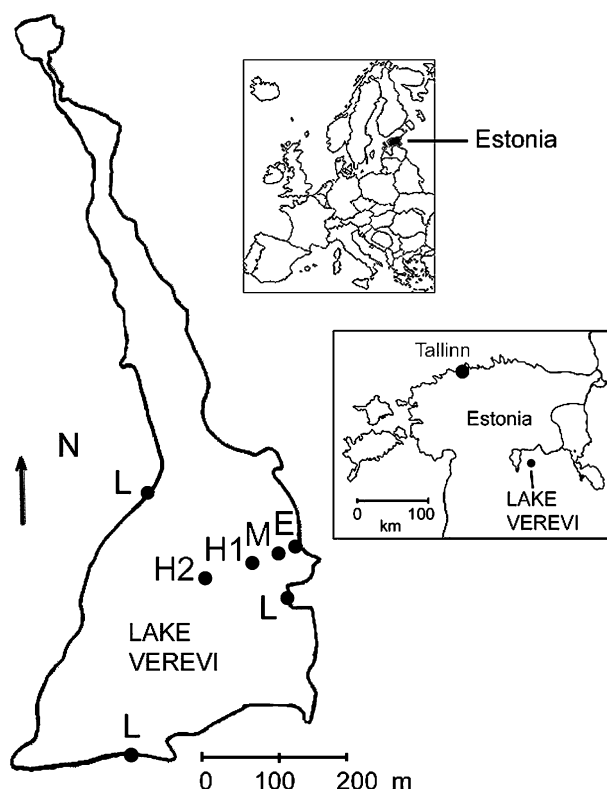


Figure 1. Location of sampling sites in 1996–2001. E – epilimnion; M – metalimnion; H1 – upper hypolimnion; H2 – lower hypolimnion; L – littoral.