

Association for the Sciences of Limnology and Oceanography





Home

Members

Libraries

Publications

Meetings

Employment

Activities

Search

Experimental evidence of a low-oxygen refuge for large zooplankton

Petter Larsson and Winfried Lampert

Limnol. Oceanogr., 56(5), 2011, 1682-1688 | DOI: 10.4319/lo.2011.56.5.1682

ABSTRACT: We tested the hypothesis that hypoxic zones in the metalimnion and hypolimnion of lakes can provide a refuge against fish predation for large zooplankton. Experiments were run in a large indoor mesocosm system (Plön Plankton Towers). We compared mortality rates of *Daphnia pulicaria* due to free-ranging fish in mesocosms with either oxic or hypoxic hypolimnia. In the presence of fish *Daphnia* moved down below the thermocline. Under hypoxic conditions their distribution peaked in the upper hypolimnion at a concentration of approximately 1 mg O₂ L⁻¹. In oxygen-saturated hypolimnia *Daphnia* were distributed evenly. The mortality rate of *Daphnia* in the hypoxic treatment was only one third of that in the oxic treatment. The hypoxic habitat provided a refuge, as *Daphnia* tolerated lower oxygen concentrations than did fish. However, there may be demographic costs associated with living in low-oxygen conditions. Hence, the importance of a hypoxic refuge under natural conditions will most likely depend on the trade-off between predation risk and cost of living in hypoxic waters.

Article Links

Download Full-text PDF

Return to Table of Contents

Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.