



Effect of pH on growth, cell volume, and production of freshwater ciliates, and implications for their distribution

Weisse, Thomas, Peter Stadler

Limnol. Oceanogr., 51(4), 2006, 1708-1715v | DOI: 10.4319/lo.2006.51.4.1708

ABSTRACT: We investigated the effect of pH on growth, cell volume, and production of the freshwater ciliates *Urotricha farcta*, *U. furcata*, and *U. castalia* in laboratory cultures with *Cryptomonas* sp. as food. Overall, pH had a significant, species-specific effect on all parameters investigated. The food alga, *Cryptomonas* sp., showed a wide pH tolerance, with positive growth rates between pH 4.4 and pH 9.65. Among the ciliates, *U. farcta* was the most pH-tolerant and *U. castalia* was the most pH-sensitive species, with positive growth being confined to pH 6.5-8.2. The pH optimum was derived from cellular production rates. The pH optima of the three ciliate species were shifted; their production rates peaked at pH 4.4-5.3 (*U. farcta*), pH 5.9-7.3 (*U. furcata*), and pH 6.8-7.9 (*U. castalia*). The pH effect on growth and survival of the ciliates was minor at circumneutral and moderately alkaline pH values, relative to the effect of temperature and food measured in earlier experiments. The widths of the pH tolerances of the ciliates were positively related to the widths of their temperature niches and to their natural distributions. *U. farcta* and *U. furcata* were characterized as euryoecious species, with broad pH and temperature tolerances and ubiquitous distribution; *U. castalia* is a rare, stenoecious species, requiring specific pH and temperature conditions.

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.

