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## **Flagellate and ciliate distribution in sediments of a lowland river: relationships with environmental gradients and bacteria**

Björn Gucker\*, Helmut Fischer

Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Department of Limnology of Lowland Rivers and Shallow Lakes, Müggelseedamm 301, 12587 Berlin, Germany

### **Abstract:**

It is generally assumed that protozoa are important predators of bacteria in the microbial food web, but limited data are available on protozoan abundance in streambed sediments. We investigated flagellate and ciliate abundance, community structure and spatial distribution in the shifting and stratified sandy sediments of a 6th order lowland river (River Spree, Germany) in relation to environmental gradients and bacteria. Flagellates and ciliates were quantified and identified using live observation and quantitative protargol staining techniques. Abundances (median and interquartile range) were 1900 cells cm<sup>-3</sup> of benthic sediment (938 to 3363, n = 104) in flagellates and 148 cells cm<sup>-3</sup> (29 to 363) in ciliates. Bodonids, colorless euglenids and hypotrich ciliates, predominantly *Aspidisca cicada* Müller, dominated the protistan community. Protistan abundance declined with increasing sediment depth in stratified sediments. A microaerophilic to anaerobic community occurred in deeper layers of these sediments. Aerobic bacterivorous protozoa prevailed in shifting sands. The protistan community seemed to be structured by an interplay of factors, such as dissolved oxygen, light penetration, bacteria and sediment composition. Estimates using published grazing rates indicated that flagellate and ciliate densities were too small to control bacterial densities in these lowland river sediments.

Key-words: Protists, protozoa, flagellates, ciliates, spatial distribution, sediments, lowland river, microbial loop, Microbial food web, microbial ecology