Aging of allochthonous organic carbon regulates bacterial production in unproductive boreal lakes

Berggren, Martin; Laudon, Hjalmar; Jansson, Mats

2009

Link to publication

Citation for published version (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.
ABSTRACT

Allochthonous dissolved organic carbon (DOC) is an important carbon source for bacterial production (BP) in humic lakes. Here we show that BP can be a function of, and decreases with, the aging of allochthonous DOC in the aquatic environment. During a seasonal cycle, bacterial bioassays coupled to calculations of average aquatic DOC age (the time span from soil discharge to observation) were performed with water from the inlets and outlets of two unproductive Swedish lakes. BP and bacterial growth efficiency (BGE) during 7-day bioassays decreased with increasing average aquatic DOC age. Parallel to the declines in BP and BGE there was a rise in specific UV absorbance at the wavelength of 254 nm (SUVA254) indicating that decreasing BP and BGE were connected to a shift to a more aromatic and recalcitrant DOC pool. The results suggest that hydrological variability in combination with lake size and temperature have large influence on pelagic BP in lakes with high input of terrigenous DOC.