Large-scale patterns in bacterioplankton allochthony across boreal lakes : evidence from fatty acid markers

del Giorgio, Paul A.; Berggren, Martin; Ziegler, Susan E.

2012

del Giorgio PA (oral), M Berggren and SE Ziegler. 2012. Large-scale patterns in bacterioplankton allochthony across boreal lakes: evidence from fatty acid markers. *2012 ASLO Aquatic Sciences Meeting: Voyages of Discovery*, presented on July 12, 2012, at Lake Biwa, Shiga, Japan

ABSTRACT

There is considerable debate on the relative importance of terrestrial C to the functioning of lake food webs. One of the main entry points of this allochthonous C is via its incorporation into bacterial biomass, which can then be trophically transferred. In previous work we have experimentally shown that, contrary to current assumptions, lake bacterioplankton tend to selectively respire algal-derived organic C, and preferentially incorporate terrestrial C into biomass. One of the main corollaries of this pattern in C allocation is that bacterial biomass should be preferentially terrestrial, even in lakes that are productive and thus dominated by algal-derived C. We have explicitly tested this hypothesis, by determining the isotopic (13C) signature of bacterial-specific fatty acids extracted from bulk POM in lakes spanning wide trophic and DOC gradients. Our results confirm that bacterial biomass tends to be preferentially composed of terrestrial C across boreal lakes, and that even in more productive systems, terrestrial organic C makes a large fraction (> 60%) of bacterial biomass. Bacterioplankton incorporation of terrestrial C into biomass represents a steady and relatively constant source of terrestrial C to lake pelagic foodwebs, and may modulate some of the foodweb variability caused by differences in lake primary production.