

Association for the Sciences of Limnology and Oceanography





Home

Members

Libraries

Publications

Meetings

Employment

Activities

Search

Predominance of B-proteobacteria in summer melt pools on Arctic pack ice

Brinkmeyer, Robin, Frank-Oliver Glöckner, Elisabeth Helmke, Rudolf Amann

Limnol. Oceanogr., 49(4), 2004, 1013-1021 | DOI: 10.4319/lo.2004.49.4.1013

ABSTRACT: The diversity and community structure of bacteria in melt pools on Arctic pack ice floes were dominated by bproteobacteria. Thirty-five percent of the pure cultures isolated in 1997 from pack ice floes north of Svalbard and in the Fram Strait were from the B-proteobacteria group. Within this group, there were only two phylotypes clustering within the widespread Beta I cluster, also known as the Comamonadaceae clade. One phylotype, most closely related to Aquaspirillum arcticum (96.0-97.3% identical), was frequent among cultures isolated from 10 melt pools. A 165 ribosomal RNA (rRNA) gene clone library, constructed from a melt pool that was sampled 2 yr later in the Fram Strait, was also dominated by B-proteobacteria, in particular the same recurrent isolate phylotype designated IIMP-BetalII. Fluorescence in situ hybridization of 20 melt pools corroborated the cultivation and cloning data, b-Proteobacteria were the most abundant bacterial group, constituting ~49% of the bacteria that were stained by 496-diamidino-2phenylindole (DAPI). α- and γ-proteobacteria accounted for only 2% each, the Cytophaga-Flavobacterium group accounted for 9%, and the Actinobacteria spp. accounted for 9%. Approximately 63% of the 8-proteobacterial fraction that was found in the melt pools was determined with a newly developed probe to be the recurrent 8-proteobacterial MP-Betal phylotypes, indicating that it is particularly adapted for success in this extreme environment.

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.