

Diversity and distribution of prokaryotes in sediments from a hypersaline Antarctic lake

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An abundance of prokaryotes (Archaea and Bacteria) perform major biogeochemical pathway (e.g. sulfate-reduction, methane production, denitrification) in buried sediments. However, the diversity, distribution and activity of prokaryotes in sedimentary environments are poorly understood, particularly in Antarctic lacustrine environments. Then, we have explored the vertical distribution and diversity of prokaryotes in sediments of Lake Suribati, a hypersaline meromictic lake located in Skarvsnes, Soya Coast, East Antarctica, by using culture-independent techniques. Lake Suribati contains seawater that has been concentrated by evaporation, and it shows a typical meromictic stratification of aerobic epilimnion (40-120 psu) and anaerobic hypolimnion (120-200 psu).

A sediment core (63 m long) containing black organic mud was collected from Lake Suribati, using a 2 m-long piston corer. A total of 27 subsamples from each 2.3 cm sediment layers were allocated. Metagenomic DNAs were extracted from 250 mg of subsamples, and nearly full-length bacterial 16S rRNA gene (16S rDNA) fragments were PCR amplified and cloned.

A total of 613 clones yielded 12 phyla (95 phylotypes) were retrieved from eleven clone libraries. Two prominent groups of the phylum relevant to *Bacteroidetes* (177 clones) and *Proteobacteria* (118 clones) were found in all the vertical, particularly shallower, sections of the core. Similarly *Firmicutes* (96 clones) and the TM6 group (24 clones) were detected in almost all core sections. On the other hand, *Cyanobacteria*/Chloroplast (102 clones) and *Gemmatimonadae* (16 clones) formed patchy distribution.