

## P1.07 Demonstration of Cellulolytic Activity in Antarctic Lake Bacteria

*Itamar S. Melo<sup>1</sup>, Elke S. D. Vilela<sup>1</sup>, Luiz H. Rosa<sup>2</sup>, Vivian H. Pellizari<sup>3</sup>*

<sup>1</sup> Embrapa Environment, CP 69, CEP. 13820-000, Jaguariúna, SP – Brazil

<sup>2</sup> Institute of Biological Sciences, Federal University of Minas Gerais, Belo Horizonte, MG – Brazil

<sup>3</sup> Oceanographic Institute, University of São Paulo, São Paulo, SP – Brazil

Corresponding mail: I.S. Melo, [itamar@cnpma.embrapa.br](mailto:itamar@cnpma.embrapa.br)

Microbial activity in low temperatures in the Antarctic Continent is restricted to small amounts of unfrozen water inside the permafrost soil or the ice, and to brine channels. Very little is known about the bacterial diversity in Antarctic lakes. They play a major role in the cycling of nutrients and are responsible for the breakdown of the organic matter. Psychrophilic bacterial strains, and particularly their enzymes that are able to perform catalysis efficiently at low temperatures, have been proposed for use in a number of biotechnological applications. This study was conducted to assess the occurrence of cellulolytic bacteria from the Lake Steinhouse, located at Keller Peninsula in Admiralty Bay, Antarctica (62° 09`S, 58° 28`W). Admiralty Bay is the largest Bay (131 km<sup>2</sup>) on King George Island. Cellulose, in the form of thick cotton string served as bait for the isolation of bacteria. The cellulose baits (thick cotton string) were placed at different depths, and in equidistant points of the Lake Stenhouse in mid-summer (December-January 2008-2009). They provided matrices for colonizing biomass and source material for isolation of marine polysaccharide degrading bacteria. Colonization of microorganisms in the cellulose baits was examined by scanning electron microscopy. Fifty-five bacterial strains were recovered from the baits and tested for total cellulase and endoglucanase activities. Two of them, identified as *Bacillus subtilis* and *B. pumillus*, showed high cellulolytic activity. The period of 16 days of incubation of the cellulose baits in the Lake, although very short, allowed observe the biofilm formation and individual microorganisms, including cyanobacteria, bacteria and diatoms, to the string surface. This study throws light on the presence of bacterial population in an Antarctic Lake and its possible role in degradation of organic matter.