



## Microbiological studies of East Antarctic soils

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In the microbiota of the Antarctic soil, psychotrophic and psychrophile microorganisms adapted to grow under low temperature conditions prevail. In the soils from the drought valleys in the Mc.Murdo Station area, J.M. Madden et al. discovered bacteria belonging to *Bacillus* and *Corynebacterium* genres. A new species of *Corynebacterium* genus, that is *C. peregrinum*, resisting to radiations and that produces a red pigment was described. Biochemical studies demonstrated that these psychotrophic bacteria resist to freezing-melting cycle. Our research aimed to carry out microbiological studies to isolate and identify the microorganisms species populating the soils in the Molodezhnaya and the Novolazarevskaya Old Station areas in East Antarctica, based on the analysis of 30 soil samples. Thus, aerobic heterotrophic bacteria were identified by sample decimal dilution and seeding on the Topping agar-treated culture medium, followed by selective colouring and optical microscope examination on the smears prepared by the developed colonies. The first set of soil samples from Molodezhnaya Station zone had  $100\text{-}1030 \times 10^3$  cfu/g soil d.w. bacteria and  $22\text{-}151 \times 10^3$  cfu/g soil d.w. microfungi. The identified bacterial species were: *Bacillus cereus*, *B. megaterium* and *Pseudomonas sp.* Among fungi we mention *Penicillium glabrum*, *Pullularia pullulans*, *Heterocephalum aurantiacum*, *Papulaspora sp.*, *Cladosporium herbarum*, *Cladosporium cladosporioides*, *Alternaria alternata*, *Phoma exigua*. In the lakes zone, only the unsporogenous bacteria were found: *Flavobacterium*, *Mycobacterium* and, as microfungi, *Dendriphiella arenaria* and *Cladosporium* were isolated. In the second set of soil samples from the same area, the bacteria were more numerous ( $110\text{-}5140 \times 10^3$  cfu/g soil d.w.), *Arthrobacter* being also identified. Microfungi ( $12\text{-}500 \times 10^3$  cfu/g soil d.w.) belong to the species: *Cladosporium* and

*Chrysosporium* with intense cellulolytic representatives. The next species were isolated in addition to the previous soil sample set: *Trichoderma viride* and *Humicola fuscoatra*. Colonies resembling a lot with *Aureobasidium pullulans* were isolated, their origin being disputable yet; this fact was also reported by other researchers for the Antarctic soil samples. (Vishniac, 1996). The samples from Novolazarevskaya Old Station shown similar values of the bacterial number ( $2240-3550 \times 10^3$  viable cells/g d.w.). Most of the identified bacteria presented intensely coloured yellow, orange and red colonies belonging to the *Mycobacterium*, and *Flavobacterium* *genuses* and to the species *Arthrobacter citreus* or *Bacillus subtilis*. The fungi microflora was less represented ( $11-35 \times 10^3$  cfu/g d.w.) and the species number was not higher than 5 and, in this case, the prevailing species belong to the *Cladosporium* and *Chrysosporium* *genuses*. The species shown intense cellulolytic activity on the Stapp medium.