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Diversity of bacteria producing pigmented colonies in aerosol, snow and soil samples from remote glaciated areas (Antarctica, Alps, Andes)

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Five different cultures of pigmented bacterial colonies were obtained by incubation of samples retrieved from high elevation snow collected in the Alps (Mt. Blank area) and the Andes (at the summit Nevado Illimani, Bolivia), from Antarctic aerosol (French station Dumont dUrville) and soil (King George Island, South Shetlands), in mineral medium (B G 11). Molecular analysis of more than 200 16S rRNA gene clones showed that all the cultured cells belong to the Bacteria domain. The phylogenetic analysis of the sequences showed close relationship with -, - and -Proteobacteria, Actinobacteria and Bacteroidestes. The Andes snow culture exhibited the highest level of diversity, with sequences with high similarity with Afipia, Agrobacterium, Brevundimonas, Limnobacter, Hydrogenophaga, Pseudonocardia, Microbacterium spp. and an uncultured Bacteroidetes. The composition of two of the Alps sampling sites differs. At Col du Midi , sequences related to Bradyrhizobium, Afipia, Agrobacterium, Limnobacter, Hydrogenophaga, Pseudomonas and an uncultured Bacteroidetes spp. were found, while at Col du Dome; only Bradyrhizobium, Zooglea, Dietzia spp. were detected. In the Antarctic, aerosol sequences with high homology with Bradyrhizobium, Brevundimonas, Limnobacter, Hydrogenophaga, Pseudonocardia and Brachybacterium spp. were found. The Antarctic soil showed the lowest level of diversity, only one sequence out of fifty clones analyzed showed high homology with Brevundimonas spp.