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Università degli Studi di Napoli "Parthenope"

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Topic: Marine biology and ecology

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ABSTRACT Subject :

UV-resistant bacteria in Antarctic aquatic environment of the Ross Sea

Abstract 14/02/2023 13:07:09

Antarctic aquatic microorganisms are exposed to extreme conditions of temperature, UV radiation and ice and have developed unique strategies to cope with these harsh environments. In this context, photoprotective defense mechanisms are fundamental to counteract UV-damage due to the solar UV-B radiation including both a non-enzymatic and enzymatic antioxidant systems. The aim of this study is to improve the knowledge on the biodiversity of UV-resistant bacterial communities, inhabiting the marine area of the Ross Sea (Antarctica). We isolated and identified thirty-one UV-resistant Antarctic bacteria collected from surface sea waters/ice and shallow lake sediments in Tethys Bay, Road Bay, Edmonson Point and Inexpressible Island. Phylogenetic analysis, based on 16S rRNA gene sequence, assigned the isolates to the Proteobacteria phylum encompassing five genera (*Brevundimonas*, *Psychrobacter*, *Qipengyuania*, *Sphingorhabdus*, *Sphingobium*), to Actinobacteria including seven genera (*Kocuria*, *Gordonia*, *Rhodococcus*, *Micrococcus*, *Arthrobacter*, *Agrococcus*, *Salinibacterium*) and Firmicutes represented by only two genera, i.e. *Staphylococcus* and *Bacillus*. Strains belonging to Proteobacteria and Actinobacteria phyla were detected in all sites and were the most abundant species in all different environments considered in this study. Many of these bacteria showed pigmentation, suggesting that pigments may represent an important antioxidant defence against exposure to UV radiation in the extreme Antarctic environment.

