Programma Nazionale di Ricerche in Antartide (PNRA)

Final project report

<table>
<thead>
<tr>
<th>Project ID</th>
<th>2002/1.03</th>
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<tr>
<td>Title</td>
<td>Responses of Antarctic terrestrial and freshwater ecosystems to latitudinal variations of climatic and environmental conditions</td>
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<td>Principal investigator</td>
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<td>Duration</td>
<td>2 years</td>
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<td>Assigned funding</td>
<td>222.000,00 Euro</td>
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Activities and results

The project aimed at evaluating possible effects of global climate changes on Antarctic ecosystems through the study of water availability, the biogeochemical cycle of major and trace elements, biological diversity, ecophysiology and phylogeny of algae, fungi, mosses, lichens and microarthropods in Antarctic ice-free areas, disposed along latitudinal and/or altitudinal gradients. Seven research units were involved in the project: Bargagli R. (University of Siena; environmental biogeochemistry and colonization processes); Andreoli C. (Dept. of Biology, University of Padoa, biology and ecophysiology of soil and freshwater phototrophs); Carchini G. M. (Det. of Biology, University of Tor Vergata, Rome; freshwater invertebrates); Frati F. (Dept. Evolutionary Biology; University of Siena; genetic variability and phylogeny of Antarctic collembo); Fumanti B. (Dept. of Vegetable Biology; University “La Sapienza” Rome; taxonomy and biology of Antarctic algae); Nimis P.L. (Dept. of Biology, University of Trieste; taxonomy and biology of lichens); Onofri S. (Dept. of Environmental Sciences, University of Tuscia, Viterbo; taxonomy and biology of microfungi).

Results of major scientific interest are reported in articles listed below and can be summarized as follow:

1. chemical weathering processes in Victoria Land ice-free areas are negligible and the marine environment through aerosols and seabirds (nesting in costal areas) provides most elements essential to the metabolism of algae, mosses and lichens;
2. patches of a new moss species for continental Antarctica (Pholia nutans) were discovered on Mount Rittmann fumaroles (northern Victoria Land). Genetic investigations (in collaboration with M. Skotnicki from the Australian National University, Canberra, Australia) showed that the different patches had a very similar genetic pattern (i.e. they probably originated from one or very few immigrant spores);
3. Genetic and molecular biology characterization of a new algal species (Koliella antarctica) and identification of 3 new species of Xantoficea. Morphological, ultrastructural and cytochemical studies on several species of Antarctic Chlorophyta and Rhodophyta;
4. population genetic and phylogeny of two species of Antarctic collembo: Gomphiocephalus hodgsoni and Cryptopygus antarcticus.
5. Isolation of some new species of Antarctic microfungi belonging to the endemic genus Cryomyces; characterisation of their exopolysaccharides and studies on the effects of UV-B on their spores;
5. establishment of Antarctic algae and lichen databases; contribution to the SCAR-RiSCC Biodiversity Database.

Products

A – papers in scientific magazines

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B – book chapters


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**Date:** 30 March 2010

**Notes**