

Biological prospecting in Antarctica

The growth of genetic and biochemical research techniques has stimulated interest in 'biological prospecting' – the search for useful and beneficial compounds and gene sequences hidden in the world's extraordinary biodiversity.

Some of these compounds have surprising applications, and a ready market can await those who isolate them and establish a commercial use. Lucrative applications can be found, for example, in medicine, pharmaceuticals, cosmetics, agriculture and food processing.

Research interest extends to Antarctica where, for example, the United Nations University – Institute of Advanced Studies (UNU-IAS) has reported Actinobacteria belonging to a genus which elsewhere has produced pharmaceutically active compounds. UNU-IAS has also reported research into a glycoprotein that may increase the tolerance of commercial plants to freezing, extend the shelf-life of frozen food, improve cryosurgery, or enhance the preservation of transplant tissues; and research into the use of cold-active enzymes from bacteria, for better detergents and cleaning agents.

While some patents involving Antarctic organisms have been granted, no windfall profits have emerged from biological prospecting in Antarctica...yet. Elsewhere, the growth in the industry is substantial and Antarctica is unlikely to be immune from significant future investment. Biological prospecting requires painstaking research and an expectation of many disappointments along the way — but the potential benefits are huge. If successful in Antarctica, the financial return could dwarf the value of tourism, which is currently the most significant commercial activity in the region.

Parties to the Antarctic Treaty must now begin to grapple with this potentially contentious activity. Some say biological prospecting is environmentally benign, has been underway in Antarctica for some years, and that it is consistent with the Antarctic Treaty and the environmental Protocol and needs no



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Biological prospecting of Antarctica's biodiversity, such as these marine creatures under the sea ice near Casey, has become a hot discussion topic for Antarctic Treaty Parties.

further regulation. Others say biological prospecting is a significant commercial challenge facing the region, and that it is risky if a proper regulatory framework is not in place. Discussions have drawn distinctions between the impacts of large-scale harvesting of valuable organisms, and the negligible impacts of small samples that are removed from the environment so that the biochemical properties can be identified and synthesised elsewhere.

The Antarctic Treaty System does not specifically regulate biological prospecting, although some elements of the system may be relevant. For example, the Treaty provides for the free exchange of scientific observations and results from Antarctica, and the environmental Protocol subjects all activities to prior environmental impact assessment. Some argue that biological prospecting can be managed successfully within existing rules, like any other Antarctic research, but others are not so confident.

While biological prospecting has been discussed in Treaty meetings since 2002, consideration of the issue has been intermittent and has not addressed regulatory measures. The discussions have been informed by the work of UNU-IAS and by Treaty Parties that have contributed a number of useful papers. Several potentially complex legal and political issues have been raised, and a number of related issues have been identified for further

consideration. These include, for example, the question of how the potential commercial value of the research findings sits with the obligation for free exchange of the scientific results.

During the 2007 Antarctic Treaty Consultative Meeting (ATCM) in New Delhi, The Netherlands proposed discussions on a regulatory framework for biological prospecting. The Treaty Parties decided that inter-sessional work should prepare the ground for a more considered analysis of the issues at the 2008 ATCM. A contact group was established to identify issues and current activities related to Antarctic biological prospecting, to assist ATCM discussions, and recommend ways to advance the work in the future. The Netherlands will convene the group and the Treaty Secretariat will provide support, including setting up an interactive discussion forum through the Secretariat web site.

Australia has signed up for the inter-sessional discussions and will pursue the issues with interest. In Antarctica, it really may turn out to be true that great things come from (microscopically) small beginnings.

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More information

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