

BIODIVERSITY SCIENCE IN THE DEEP SEA: THE EURODEEP PROGRAMME

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Abstract

The aim of the multidisciplinary EUROCORES Programme EuroDEEP (Ecosystem Functioning and Biodiversity in Deep Sea), coordinated at the European Science Foundation (ESF, Strasbourg, France) is to further explore and identify the different deep-sea habitats, assessing both the abiotic and biotic processes that sustain and maintain deep-sea communities in order to interpret variations of biodiversity within and between deep-sea habitats, and the interactions of the biota with the ecosystems in which they live. The resulting scientific data are a prerequisite for the sustainable use and the development of management and conservation options aiming at the sustainable use of marine resources that will benefit society as a whole.

Keywords : *Deep Sea Ecology, Biodiversity, Deep Sea Processes.*

Established in 1974, the European Science Foundation (ESF, www.esf.org) as a non-governmental organisation with 78 Member Organisations (research councils, academies and other national science performing or funding agencies) from 30 countries set up in late 2003 the European Collaborative Research Programmes (EUROCORES) aiming to enable researchers in different European countries to develop cooperation and scientific synergy in areas where European scale and scope is required.

The EUROCORES Programme "EuroDEEP", Ecosystem functioning and Biodiversity in the Deep Sea, focuses on the deep sea, the largest environment on Earth, which contains important mineral and biological resources of interest for science, industry and society. The deep sea is a relatively continuous and highly interconnected environment composed by a wide variety of specific ecosystems, both pelagic and benthic, which sustain particular, and often unique, microbial and faunal communities with a vast yet largely unknown biodiversity [1].

The scientific goal of the various funded EuroDEEP collaborative research projects is to further explore and identify the different deep-sea habitats, assessing both the abiotic and biotic processes that sustain and maintain deep-sea communities in order to interpret variations of biodiversity within and between deep-sea habitats, and the interactions of the biota with the ecosystems in which they live [2]. The resulting scientific data are a prerequisite for the sustainable use and the development of management and conservation options aiming at the sustainable use of marine resources that will benefit society as a whole [3].

The different projects focus on three different aspect of the deep sea biodiversity, namely firstly on biological characteristics and processes in the deep sea, secondly on abiotic processes in deep-sea habitats driving biodiversity variation, and finally on the human impacts and ecosystem management. Each collaborative research project has a specific focus which goes from variation in metazoan biodiversity (species diversity, functional and food web diversity, niches) within and between habitats and ecosystems, over the exploration of the biodiversity of specific deep-sea habitats such as seamounts, deep-water coral reefs (fig. 1), vents, gas and fluid seeps, large organic inputs (e.g. wood or whale falls), to the understanding of the biogeochemical pathways that sustain microbial systems and assessing the biodiversity of deep-sea microbes, their control and their possible interactions with metazoans for example in hypersaline anoxic lakes, while other projects will try to unravel population structure and population connectivity in economically important deep-sea fishes. Other investigators will focus on discontinuity layers (spatially confined but pronounced density gradients) and mixing zones in the deep ocean, generated at the border between two different water masses that can be seen as persistent 'deep-sea ecotones'.

The field sites of the different projects are situated in the Mediterranean area or along a trophic gradient, from Eastern Atlantic to the Western, Central and Eastern Mediterranean, at the continental slopes, and at the Mid-Atlantic Ridge (MAR).

The Programme aims at providing the necessary framework and funding for the development of top-quality deep-sea research at the European level in a global context (Census of Marine Life and SCOR/IGBP), particularly building on sharing of national large-scale resources, which are essential for deep-sea research (i.e. ships, ROVs, submersibles, AUVs, deep-towed

vehicles, deep-sea sampling equipment, new sensors, etc.) as well as the coordination of efforts amongst scientists and laboratories from the countries involved and links with ongoing projects. EuroDEEP is a Programme for deep-sea biology and ecology that strongly depends and requires collaboration between taxonomists, microbiologists, ecologists, physical and chemical oceanographers and geologists [2].

The launch of the Programme is foreseen for June 2007 and the international, multidisciplinary collaborative research projects are supported particularly by research funding agencies from Belgium, France, Ireland, Italy, the Netherlands, Norway, Poland, Portugal and Spain, and by the European Science Foundation through contract No. ERAS-CT-2003-980409 of the European Commission, DG Research, FP6. EuroDEEP is coordinated by Dr. Inge Jonckheere at the ESF, Strasbourg (FR).

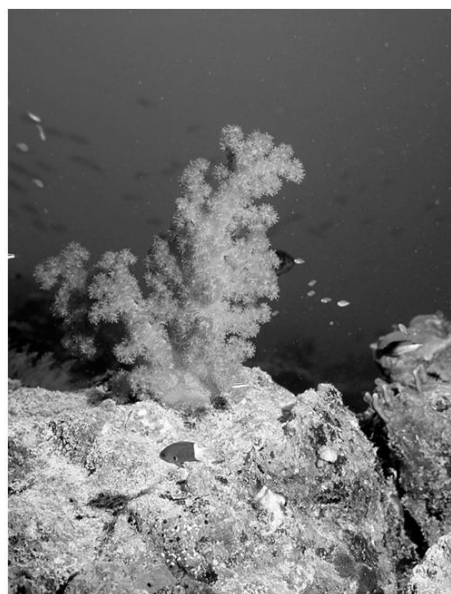


Fig. 1. A deep-water coral reef as an oasis for marine life.

For the latest information, please check the EuroDEEP Programme website: www.esf.org/eurodeep.

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