

SUMMARY

The present project is a pilot study of the biodiversity, structure and functioning of the marine littoral ecosystems in front of the Bulgarian coast (BAB) on Livingston Island. This hydrobiological study will provide valuable information on the taxonomic composition, the quantitative parameters (abundance, biomass), the structure (trophic, size, age) of the marine littoral communities: bottom invertebrates, phytoplankton, zooplankton, fish, macroalgae. Using bioindication, taxonomic, structural and functional features of marine communities as a basis, the project will be developed to carry out initial hydrobiological monitoring. Such research has so far not been carried out within the framework of the National Polar Research Program, and for the South Ocean they are still too limited. On the other hand, the relevance of the project theme is also borne out by the specific features of the marine ecosystems of the South Ocean and the ever-increasing global anthropogenic impact: pollution, climate change, invasive species. Polar marine ecosystems are very peculiar, species-rich, have evolved their own evolutionary path in an environment with extreme values of factors. Because of their nature, these ecosystems are very vulnerable, easily susceptible to negative changes from anthropogenic activities. The marine ecosystems of the South Ocean are a kind of laboratory in which negative changes can be easily traced and studied. The successful solving of the assigned research tasks will also show the extremely important "reference" ecological situation, i.e. the situation is still relatively preserved in its original form, marine ecosystems. This reference situation is an appropriate benchmark for measuring the extent of deviation (if anthropogenic changes occur) when implementing a future permanent monitoring of the ecological status. The current project proposal aims to carry out a pilot study on the biodiversity, structure and functioning of the marine coastal ecosystems in the living area of Livingston on the Bulgarian polar base. On this basis, an initial exploratory hydrobiological monitoring will be carried out. For a successful and realistically logistic and volumetric plan, the implementation of this project will examine in more detail the key (bioindicator) communities - macrozoobenthos (bottom invertebrates) and phytoplankton. Studies on the taxonomic composition of marine communities will also allow information on the presence of invasive alien species, one of the greatest threats to biodiversity on a global scale. The abiotic conditions that marine ecosystems provide - physical (temperature, turbidity) and hydrochemical (electroconductivity, salinity, pH, oxygen content and saturation, and biogens), will also be examined. This project includes Bulgarian scientists, who are well-established specialists - hydrobiologists working for years on project tasks together with the MoEW and other structures (BD, CRL) to carry out the annual monitoring activities in the national hydrobiological monitoring system. Therefore, this part of the Project Proposal will be successfully implemented - physical and hydrochemical analyzes, conducting hydrobiological monitoring. On the other hand, some of the team's specialists have devoted their research to the taxonomy and ecology of aquatic invertebrates, zooplankton and fish fauna. Therefore, the composition, structural and functional organization of marine ecosystems will also be successfully and accurately investigated. Insofar as the crustaceans Amphipoda is expected to be one of the best-represented groups (and one of the most difficult to identify) compared to foreign data in similar areas, the team being an associate and foreign specialist with experience with these species of polar regions. Apart from scientists, one MS student and two PhD students participate in the team. They are mainly engaged in technical and laboratory work, according to their capabilities. Involving them in the team will significantly increase their skills and knowledge, their competence and career advancement. The interdisciplinary approach as routinely used in performing hydrobiological research (combining environmental factors data with community features and the structure of communities) will allow for a variety of scientific results. They will be reported at international conferences, and articles on the different thematic areas will be published: 1. *On the dynamics of the abiotic factors of the marine environment* 2. *Taxonomic - on the composition of the marine benthic organisms* 3. *Functional-ecological - for the data from all the communities* 4. *On the monitoring results* - Assessment of the ecological status of the marine coastal waters; The participation of conferences and the publication of scientific papers will increase the reputation of Bulgarian scientists internationally.