



NW Black Sea ecosystems recovery from former severe seasonal hypoxia and effect on macrofauna

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The benthos researches carried out in the last decade on the NW Black Sea shelf established the transitional process of the bottom communities, from the severe disturbed state resulted from seasonal hypoxia of high eutrophication from 1970-2000 period towards a new state.

The authors, with their expertise achieved in the framework of several national and EU FP6&7 projects (SESAME, HYPOX, PERSEUS), analyzing more than 600 quantitative samples, consider the benthic associations influenced mainly by the Danube River discharge being characterized as follows:

- decrease in the specific diversity (e.g. Mollusca – from 170 species in the 1960s – 1970s to 70 species in the present in NW Black Sea);
- loss or diminishing of some habitat areas (typical habitat with *Zostera*, *Phyllophora*, *Cystoseira*, *Barnea*, *Donacilla* etc.);
- increase in the numeric abundance and biomass of some specific benthic populations (*Melinna*, *Alitta*, *Dipolydora* etc.);
- loss or reduction of some specific populations (*Abra prismatica*, *Spisula subtruncata*, *Chamelia gallina* etc.);
- replacement of some strong and quite large benthic populations by metapopulation of small extension;
- diminution of the biofilter strength by reduction of the filter – feeder populations;
- qualitative and quantitative worsening of benthic biological resources, especially molluscs - forms playing an important ecological part and with great economic importance (mussel *Mytilus galloprovincialis*, soft-shell clam *Mya arenaria*, veined rapa whelk *Rapana venosa*);
- thriving of opportunistic forms (especially worms populations causing sediment bioturbation – *Melinna palmata*, *Heteromastus filiformis*) and, temporarily, some exotic species recently pervading Black Sea (*Mya*, *Anadara*, *Rapana* etc.);
- great quantitative fluctuations of all benthic populations;
- occurrence of some weak sign of ecosystem recovery.

However, recovery of the benthic ecosystem appears to be less certain although an improvement on regeneration of macrophytobenthos and macrozoobenthos is suggested by the available data.

The process of recovery of the Black Sea will take a long time and will require the implementation of all measures envisaged by the Black Sea Strategic Action Plan as well as some future provisions.

The process will be further complicated by the fact that scientific knowledge and information on many processes and phenomena, which are needed for policy and decision making, are missing.

The opinion of authors concerning the future conservation of the Black Sea biodiversity in the context of climate change and the actual state of socio-economic system of the Black Sea Region (environment-related science and policy) is that to have in mind the following key aspects:

- facts are uncertain (lack of knowledge of the impacts of some mitigation and adaptation measures on biodiversity as a whole and some habitats or taxa in particular and the transfer of “best practices” should be undertaken with caution in order to ensure their applicability to a new situation);
- natural and economic values in dispute,
- stakes high and decisions urgent.

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