

QUALITATIVE AND QUANTITATIVE ASSESMENT OF THE MACROBENTHIC POPULATIONS OF CRUSTACEANS FROM THE NORTH - WESTERN PART OF THE BLACK SEA

Adrian Teaca¹, Tatiana Begun¹, Marian Traian Gomoiu¹ and Victor Surugiu^{2*}

¹ National Institute of Geology and GeoEcology – GeoEcoMar, Constanta Branch

² Universitatea Alexandru Ioan Cuza Iasi - vsurugiu@uaic.ro

Abstract

The paper presents the crustaceans' populations state in period 2003 - 2008. The total number of species was 66, approximately 60 % of the total number of species recorded in the NW Black Sea during the period 1960 - 1970. The most abundant crustacean was the opportunistic species *Ampelisca sarsi*.

Keywords: Crustacea, Zoobenthos, Black Sea

Introduction. Marine diversity is often a scope of environmental research especially within the framework of global environmental changes. The pontic crustaceans' fauna, although in small number of species, represent a complex group with a definitory importance in the benthic biocoenosis, from the limit of breaking waves zone to periazotic level. The state of any benthic community in the NW Black Sea region represents the "mirror" of ecological changes along the time, reflected in the "inventory" of the biota quality and quantity, published in the last 10 years in several papers [1, 2]. Nevertheless, researches referring to the crustaceans' population especially from the Romanian Continental shelf are very scarce.

Materials and Methods. In the period 2003 - 2008, a number of 437 quantitative benthos samples were collected between 0 – 213 m depths by means of the van Veen-type grab, box corer and multicorer. The offshore samples were collected during several cruises (R/V „Akademik” 2003, 2006, R/V „Parshin” 2005, R/V „Poseidon” 2008, R/V „Mare Nigrum” 2006, 2007 and 2008), while the inshore samples during several national projects covering only the sedimentary substrata. The sampling was done with 0.1 m⁻² van Veen grab, or by 0.25m⁻² box corer and 0.15 m⁻² multicorer.

Results and Discussion. The analyses of the samples helped identify 66 species (Cirripedia - 1, Amphipoda - 35, Cumacea - 8, Mysida - 3, Tanaidacea - 2, Isopoda - 6 and Decapoda - 11), approximately 60 % of the total number of species recorded in the NW Black Sea and 65 % in the Romanian littoral zone during the period of "ecological prosperity" (Fig. 1). The mean abundance of the crustaceans' populations was 1,156.9 indv.m⁻² for density and 5.78 g.m⁻² for biomass. There are some differences in the spatial distribution of crustaceans in the NW Black Sea. The average density and biomass decrease as far as water depth decrease according to a logarithmic relation (Density - R² = 0.84; Biomass - R² = 0.93), from 1,806.5 indv.m⁻² at 0-20 m depth, to 13.3 indv.m⁻² at 111-130 m for density and 9.27 g.m⁻² at 0.03 g.m⁻² for biomass (Fig. 2)

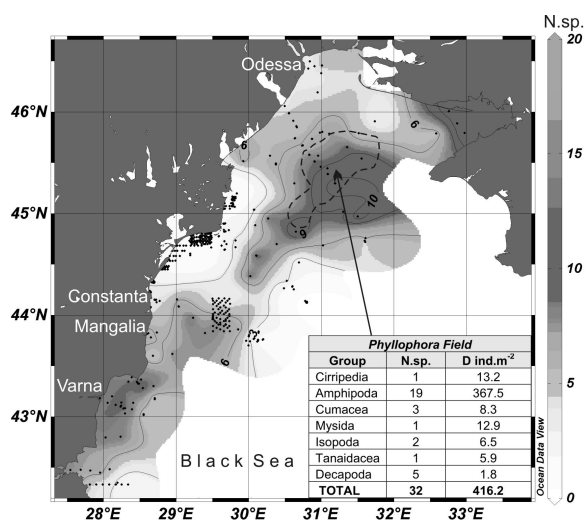


Fig. 1. The number of species of macrobenthic crustaceans' distribution in the NW Black Sea region

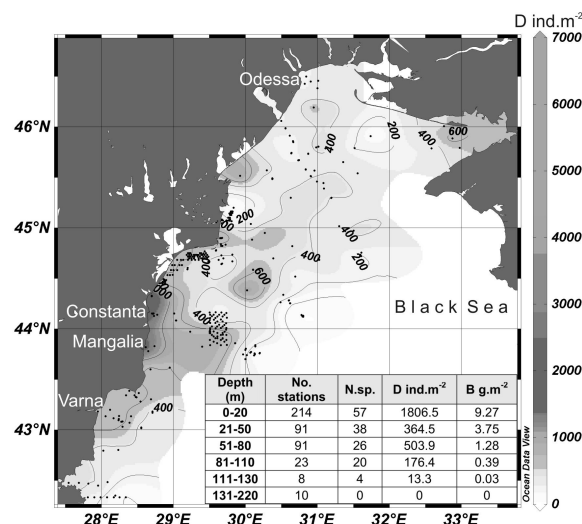


Fig. 2. The numerical abundance of macrobenthic crustaceans' distribution in the NW Black Sea region

The deep zone typical populations of crustaceans are stationed at 50 - 81 m deep. As the depth increases, the effectivenesses and the number of species decreases progressively. The dominant species in offshore zone are: *Ampelisca sarsi* (F-50 %), *Pericolodes longimanus* (F-46 %), *Phthisca marina* (F-44 %), *Apeudes acutifrons* (F-32 %), *Balanus improvisus* (F-32 %), *Apherusa bispinosa* (F-30 %), *Iphinoe elisae* (F-30 %), *Microdeutopus versiculatus* (F-29 %), *Caprella acanthifera* (F-27 %), *Corophium runcicorne* (F-25 %) and *Eudorella truncatula* (F-25 %). The populations from bathimetric interval 0 - 20 m are more heterogen realising the passage from littoral associations of sandy substratum to the muddy ones. The average density value recorded in the littoral zone exceeds 1,860 indv.m⁻², being four times higher than in the deep zone associations (455 indv.m⁻²). These great values are explainable by the intercalation of two great biocoenotic associatios: faunistic association on the hard substratum and those from sedimentary substratum (implicit the spreading of hard substratum species in the structure of sedimentary associations) and also by the structure of littoral populations dominated in majority by the *A. sarsi* (F-55 %, 1,300 indv.m⁻²), *B. improvisus* (F - 35 %) and *Iphinoe maeotica* (F-25 %). Zernov's *Phyllophora* Field became one of the most outstanding examples concerning the ecosystem degradation and biodiversity losses. The knowledge of the *Phyllophora* association state represents the key to the ecosystem recovery valuation. Without considering the modifications suffered, the maximum diversity of crustaceans (32 species) remains within the initial areal with *Phyllophora* due to habitats' variability (macrophytes, mussels clumps) (Fig. 1). Concluding, the observations made show a major restructuring of the existent populations through the great number of constant species, which dominate the benthic biocoenosis.

References

- Gomoiu M.-T., 1997. General data on the marine benthic populations state in the NW Black Sea in August 1995. *GEO-ECO-MARINA*, 2: 179 - 199
- Gomoiu M.-T., 2004. New approaches in the assessment of the Black Sea ecosystems. *GEO-ECO-MARINA* 9/10: 3 - 7