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Free-Nematodes in the NW Black Sea meiobenthos - diversity, abundance, distribution and importance as indicator of hypoxic waters

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The aim of this study performed within EU FP7 Hypox Project was to get deeper knowledge about species of nematodes that could be indicators for stressful biotic conditions as low oxygen concentration due to phenomena of seasonal hypoxia. The Nematodes come from meiobenthos sampling (using a multi corer with 4 tubes, Mark II type, lowered into the sea from R/V "Mare Nigrum" board) performed in May and September 2010 and April 2011 along four transects crossing the Romanian continental shelf from where 87 meiobenthos samples were collected.

In the studied area 96 species of nematodes were found. The authors analyzed the nematodes populations' distribution on four profiles: Sf. Gheorghe, Portita, Constanta and Mangalia. The qualitative and quantitative structure of nematodes populations was compared. 41 species were found on Mangalia profile, 47 species on Portita profile, 48 species on Constanta profile and 85 species on Sf. Gheorghe profile. The greatest densities were found on Constanta profile with an average of 369.607indvs/m-2. The most frequent and abundant species were: Sabatieria pulchra, Sabatieria abyssalis, Terschellingia longicaudata, Viscosia cobbi, Axonolaimus ponticus.

The species assemblages were assessed for depth gradient distribution, 7 depth intervals being set from 20 to 210 m. The greatest diversity was noted in 61-100 m depth interval, while the lowest between 0-20 m. On the contrary, in terms of density of individuals (indvs/m-2), highest densities were obtained in shallow waters between 21-30 m. As far as the depth increases, the species assemblages change, becoming more favorable to species like Halalaimus ponticus, Metachromadora macrouthera, Halanonchus bullatus, Linhomoneidae species. However, on the first place still remained Sabatieria abyssalis.

The vertical distribution of nematodes in sediments was analyzed for the surface layer 0-5 cm and sub-surface layer 5–10 cm, the dominant species in both layers being: Sabatieria pulchra, S. abyssalis, Terschellingia longicaudata, Viscosia cobbi, Axonolaimus ponticus, Metalinhomoeus zosterae, Enoplus euxinus, Eleutherolaimus longus. The density decreases in 5–10 cm layer as compared to 0–5 cm layer.

Results show that a dominant nematodes community tolerant to eutrophication conditions, organic loading and hypoxic conditions, made up of species of Sabatieria pulchra, Sabatieria abyssalis, Terschellingia longicaudata etc., is spread throughout the whole investigated area, from the shallow waters to the deepest bottoms at the limit of the metazoan life development. Literature confirms the ubiquitous distribution of these species, often found in areas of low O_2 concentration. The taxonomic diversity increases with depth, which may suggest that the nematodes in the Black Sea, under unfavorable conditions, may have an adaptive strategy in response to the lack of resources or in the presence of physiological stress factors.