



## THE LEVELS OF RADIONUCLIDES AND HEAVY METALS IN BLACK SEA ECOSYSTEMS (BULGARIA)

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In order to evaluate the influence of geographically varying marine ecosystem properties on the uptake of radionuclides and toxic metals in marine environment samples of sand, slime and silt sediments were taken during the period 1991-2004. Samples were collected from different zones along the Bulgarian Black Sea coast from the north Romanian border (Durankulak) to the South Turkish border (Rezovo).

Technogenic and natural radionuclides were measured by Low-level Gamma Spectroscopy using HPGe detector with 35 % counting efficiency and energy resolution 1.8 KeV (1332 KeV). Heavy metals (HM) were measured by Atomic Absorption Spectrometry (AAS) - ETAAS (Perkin - Elmer Zeeman 3030 with graphite furnace) and flame AAS (Pye Unicam SP 1950).

The measured radionuclides concentrations in Black Sea sediments were found to depend on sediment type. Slime sediments accumulate technogenic (<sup>137</sup>Cs) and natural nuclides (U and Th series) to the highest extent. Considerably low levels of technogenic and natural radionuclides and a narrow concentration intervals were established for sand and silt sediment samples.

The intercomparison of radionuclide and HM content in bottom sediments from one and the same sampling location gives information for mechanisms of radionuclide transfer and shows the trend of potential hazard of anthropogenic impact on marine ecosystems.

The obtained data show that highest nuclide and heavy metal content in Black Sea sediments were determined in the northern part of the Black Sea coast. It can be attributed to the influence of the big rivers entering the northern part of the Black Sea - Danube, Dnyepir, Dniester.

Data for radionuclides and heavy metals in sediments are in the limits of the cited in literature natural levels, showing no additional anthropogenic contamination.

**Keywords** radionuclides, heavy metals, sediments, Black Sea,