

[Keynote Speech]: Determination of Naturally Occurring and Artificial Radionuclide Activity Concentrations in Marine Sediments in Western Marmara, Turkey

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Abstract : Natural and artificial radionuclides cause radioactive contamination in environments, just as the other non-biodegradable pollutants (heavy metals, etc.) sink to the sea floor and accumulate in sediments. Especially the habitat of benthic foraminifera living on the surface of sediments or in sediments at the seafloor are affected by radioactive pollution in the marine environment. Thus, it is important for pollution analysis to determine the radionuclides. Radioactive pollution accumulates in the lowest level of the food chain and reaches humans at the highest level. The more the accumulation, the more the environment is endangered. This study used gamma spectrometry to investigate the natural and artificial radionuclide distribution of sediment samples taken from living benthic foraminifera habitats in the Western Marmara Sea. The radionuclides, K-40, Cs-137, Ra-226, Mn 54, Zr-95+ and Th-232, were identified in the sediment samples. For this purpose, 18 core samples were taken from depths of about 25-30 meters in the Marmara Sea in 2016. The locations of the core samples were specifically selected exclusively from discharge points for domestic and industrial areas, port locations, and so forth to represent pollution in the study area. Gamma spectrometric analysis was used to determine the radioactive properties of sediments. The radionuclide concentration activity values in the sediment samples obtained were Cs-137=0.9-9.4 Bq/kg, Th-232=18.9-86 Bq/kg, Ra-226=10-50 Bq/kg, K-40=24.4-670 Bq/kg, Mn 54=0.71-0.9 Bq/kg and Zr-95+=0.18-0.19 Bq/kg. These values were compared with the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) data, and an environmental analysis was carried out. The Ra-226 series, the Th-232 series, and the K-40 radionuclides accumulate naturally and are increasing every day due to anthropogenic pollution. Although the Ra-226 values obtained in the study areas remained within normal limits according to the UNSCEAR values, the K-40, and Th-232 series values were found to be high in almost all the locations.

Keywords : Ra-226, Th-232, K-40, Cs-137, Mn 54, Zr-95+, radionuclides, Western Marmara Sea

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