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Evaluation of the microplastics occurrence in the predeltaic and deltaic sector of the Danube River

Abstract: Microplastics are known as emerging pollutants with toxic potential on aquatic biota, especially due to their small size and property as transport vectors for other contaminants such as heavy metals, pharmaceuticals, pesticides, personal care products, etc. Although most studies focus on the presence of microplastics (MPs) in the surface layer of freshwaters, MPs are found throughout the water column. Various factors influence the vertical distribution of MPs, such as biofilm and biofouling processes, that increase their density. In the present paper, the occurrence of MPs in the predeltaic and deltaic sector of the Danube was studied in the water surface layer, 7 m depth, and sediment. Also, to assess the ecological risk of the MPs on the Danube River, three indices were calculated: Pollution Load Index (PLI), Hazard Index (HI) and the Potential Ecological Risk Index (PERI). MPs were collected from water using pump-type sampling equipment, composed of a pump with a flow rate of 5 liters/second and a 125 µm mesh net. MPs were identified using Spotlight 400 FT-IR Imaging System, producer Perkin Elmer in the Spectrometry Laboratory of the REXDAN Research Infrastructure from "Dunarea de Jos" University of Galati, Romania. Based on the results obtained, it was observed that the most frequently encountered polymers were polyethylene and polypropylene. In terms of morphological classification, most of the MPs sampled were fragments, films, and fibers.

Biography: Madalina Calmuc, Research Assistant at REXDAN Research Infrastructure from "Dunarea de Jos" University of Galati, Romani. BSc in Environmental science (2017) and MSc in Environmental monitoring and management (2019) at the Faculty of Science and Environment, "Dunarea de Jos", University of Galati, Romania. Research interest and expertise within the project theme: environmental sciences, water quality assessment, heavy metals pollution of aquatic ecosystems. Research field of the doctoral thesis is the evaluation of microplastics in aquatic ecosystems.

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