

MICROPLASTIC POLLUTION IN THE SUB-SURFACE WATERS OF THE GULF OF CADIZ

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Abstract: The impacts of microplastics on organisms and the environment have become of increasing concern but there is hardly knowledge about the sources, distribution and fate of it in the Gulf of Cadiz (GoC). A first assessment of the spatial variation in the abundance of microplastics in the GoC has been obtained using a system developed to collect particulate material (plankton and small pieces of plastic) below the water surface at a depth of approximately 5 metres from the research vessel during its sailing. The water is channelled through the ship's pipe system, its volume measured and filtered with a 45 µm mesh size. This method has the advantage of sampling particulate material continuously without creating extra work that would require putting rosettes or nets into the water, since the sampling is done from the tap that is on the ship. These samples were collected from 13 transects through the gulf of Cadiz in June 2019. Microplastics were identified using Fourier transform infrared spectroscopy (FTIR). Spatially, a clear pattern in relation to the distance from the coast was found, the density of microplastics decreased from the coastline to the outer stations, mainly in the transects of the GoC related to the three main estuaries (Guadiana, Tinto-Odiel and Guadalquivir). The highest values were found close to the Guadalquivir estuary, which contained a density that was twice that of the other two estuaries. Most of the plastics that were found were conventional plastics such as polyethylene and polypropylene. Our results indicate that this river is presently the greatest contributor of microplastics in the GoC, probably due to its higher freshwater discharge rate and the significant urban and industrial effluent originating from this basin. Monitoring efforts could therefore be focused on this area and this approach might provide data for reliable trend assessments.

Key words: Riverine inputs, pollution, gulf of Cadiz, microplastic

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