Microplastics in the drainage basin of Mar Chiquita coastal lagoon (SW Atlantic, Argentina) a MAB-Unesco reserve

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Abstract

Plastic waste pollution is one of the greatest global challenges in terms of its reduction, mitigation and evaluation of its levels/effects in different environmental matrices. Pollution level assessment in protected areas including plastic debris monitoring is mandatory. Coastal aquatic environments act as sink areas, where the watershed collector effect could lead to microplastic (MPs) deposition. The Mar Chiquita coastal lagoon (Mch, Buenos Aires, Argentina) is part of a regional/global concern reserve area and receives waters from a 10.000 Km2 watershed with streams/canals that discharge their waters after draining through different land uses. Although there are preliminary studies in terms of MPs characterization from Mch coastal areas, there is no detailed evaluation regarding the levels and characterization of MPs from a catchment area level. Therefore, this work aims to determine the occurrence and abundance of MPs in surface sediments (0-10 cm) from 19 sampling sites, considering the high, middle and low areas of the basin. MPs were extracted using SMI devices with a Cl2Zn solution (density 1.6-1.7 g/cm3) and categorized using the size color sorting (SCS) system. Preliminary results showed MPs abundances ranging from 83 - 2644 n○ items/kg p.s with the highest values observed in the mouth of the estuarine area. Additionally, microparticles of emerging concern like tire wear particles (TWPs) were observed ranging from 76.3 - 2027 n○ items /kg p.s. This TWPs occurrence was related to road infrastructure, crossing the different tributaries and channels. This work, represents the first baseline of MPs pollution in sediments of this priority conservation area from the southwestern Atlantic coast.

Keywords: Plastic debris, Microplastics, Protected areas, TWPs, Atlantic Ocean, Argentina

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