Distribution of beached microplastics carrying POPs at South Atlantic Estuary, Argentina

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Abstract

Large microplastics (> 1 mm) were sampled from coastal areas of a highly anthropized mudflat estuary in the austral Buenos Aires province (Argentina). The distribution of microplastics at the intertidal zone, addressed through quadrants sampling, showed that the principal beach zones where microplastics tend to accumulate are the high tide and the storm berm line. The average microplastic concentration in the intertidal zone was 5127 mps.dm-3 sediments while the average plastic resin pellets concentration was 453 pellets.dm-3 sediments. The diameter of the plastic pellets varied from 3.8 to 4.1 mm while their colour ranged from white to yellow/brown. Further studies on these plastic pellets confirmed HDPE as the main resin type through Fourier-transform infrared spectroscopy. Gas Chromatography-Mass Spectrometry was used to address the occurrence of Persistent Organic Pollutants (POPs) and Polycyclic Aromatic Hydrocarbons (PAHs) sorbed in the resin pellets. Results expressed as ng/g pellet were as follows: 0.95±0.09 ng/g pellet for $\sum$7OCs, 4.03±0.89 ng/g pellet for $\sum$7PCBs, 108.76 ± 12.88 ng/g pellet $\sum$16 PAHs and 122.79±11.13 g/g pellet for $\sum$29 PAHs. These findings are consistent with previous sedimentary records of these pollutants and highlight their sorption capacity and suitability as environmental indicators of chemical exposure at coastal environments.

Keywords: sediments, intertidal, pellets, POPs, DDT, HCH

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