
Macroplastics beached on Ardley Island (KGI) shores: an ASPA located in one of the most important logistic and tourist hubs for the Antarctic Peninsula area

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Abstract

Marine debris pollution, especially plastic litter, is an evident and recognized global threat. Plastic debris has been found in remote and uninhabited areas, such as the Antarctic Treaty Area, including their Antarctic Specially Protected Areas (ASPAs). Although micro- and nanoplastics have recently gained prominence due to their potential impacts on Antarctic marine ecosystems, the relevance of macroplastic litter as a source of micro-debris should not be overlooked. Our objective was to evaluate the density, composition, distribution, and accumulation rates of macroplastic debris on the coasts of Ardley Island. This island is one of the two ASPAs declared in the Fildes Region (King George Island, South Shetland Islands), one of the most important logistic and touristic hubs for the Antarctic Peninsula area. Based on transect surveys along the coast (10 m width/person), each sampling point was defined by the presence of at least one plastic debris on a 5 m radius surface. Plastic debris were counted, measured, weighted, and classified according to CCAMLR marine debris criteria. Accumulation rates were analysed on two opposite sides of the island, and the polymer composition was determined for the main CCAMLR debris sub-categories using ATR-FTIR. More than 700 debris were obtained from ~340 sampling points on Ardley Island from 2017 to 2022. Since the sampling effort (m² covered) differed among the 6 years, a standardized mean density was estimated for the island. Medium-sized debris (2.5 cm to 10 cm) were the most abundant, with Styrofoam, Polyurethane Foam, and Fragments (in CCAMLR's Other Plastics sub-category) as the predominant sub-categories. These results, included in the CCAMLR Marine Debris database, seek to contribute to the monitoring and management of plastic debris in the Fildes Peninsula area.

Keywords: Macroplastics, Antarctica, ASPA, Fildes Peninsula

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