
Exposure to microplastics by pelagic and coastal seabirds from temperate and tropical environments

Vitor Paiva^{*1}, Diana Matos¹, Vítor Silva¹, and Jaime Ramos¹

¹University of Coimbra, MARE–Marine and Environmental Sciences Centre/ARNET–Aquatic Research Network – Department of Life Sciences, Calçada Martim de Freitas, 3000-456 Coimbra, Portugal

Abstract

Plastic is currently the most common anthropogenic material in the marine environment. Knowledge on its distribution, areas of concentration and fate within the marine realm is increasing, but still scarce especially for pelagic and tropical marine regions. Given their broad spatial distribution and diverse foraging choices, seabirds can be used as samplers of the marine environment and sentinels of exposure to plastics by marine megafauna. Seven seabird species were studied in this project: Audouin's gull (*Ichthyaeetus audouinii*), Cory's shearwater (*Calonectris borealis*), Cape Verde Shearwater (*Calonectris edwardsii*), Red-billed Tropicbird (*Phaethon aethereus*), Brown booby (*Sula leucogaster*), Bulwer's Petrel (*Bulweria bulwerii*) and Boyd's shearwater *Puffinus lherminieri boydi*. Samples were collected in Portugal (Audouin's gull and Cory's shearwater) and in Cabo Verde (Cape Verde Shearwater, Red-billed Tropicbird, Brown booby, Bulwer's Petrel and Boyd's Shearwater) between February and September 2021. The presence of plastics was analyzed using faeces as a proxy for ingestion. All species showed presence of plastics (Audouin's gull = 62.5% of Frequency of Occurrence; Cory's shearwater = 41.9%; Cape Verde shearwater = 86.5%; Red-billed tropicbird = 64.7%; Brown boobies = 68.5%; Bulwer's petrel = 35.9%; Cape Verde = 44.4%). This study showed that the presence of plastics in the studied species was not only influenced by the seabird's taxonomy, but is also driven by intrinsic and extrinsic factors such as bird size, habitat, foraging area and interaction of seabirds with fishing activities. Results from this study provide more evidence to our growing perception on the ubiquity of plastic pollution in the marine environment and further supported the usefulness of using seabirds as sentinels of plastic pollution in both neritic and oceanic regions.

Keywords: Seabirds, Marine Environment, Plastic exposure, Fisheries

^{*}Speaker