
Matter of fac(ies)t? - Microplastic findings in stranded cetaceans along the German coastlines

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Abstract

Microplastics occur in marine habitats worldwide. They have been reported from locations as remote and pristine as the Arctic and Antarctic, beyond organisms of several trophic levels. Microplastic ingestion in animals can either happens intentionally or by accident. The microplastic size plays an important role in ingestion as it may correspond to the preferred prey size of predator species. Besides, microplastic transfer and accumulation within the trophic food web are considered as a main factor of plastic exposure in apex species like marine mammals.

This study investigated samples of faeces and gastrointestinal tracts of 21 cetaceans stranded along the German North Sea and Baltic Sea coasts between 2016 and 2021. This includes the big stranding event of bachelor sperm whales in 2016 (N = 13) in the North Sea, but also other toothed whale species as well as four baleen whales.

All samples were processed after an established cleaning protocol using a conventional washing machine, followed by Nile Red staining and fluorescence microscopy. The subsequent μ FTIR spectroscopy of suspected anthropogenic particles then identified microplastic polymer types. A variety of polymer types of the isolated particles could be revealed (e.g., Polyester, Polyolefine, Polyamide, and Polyethylene).

Keywords: Microplastic, faeces, gastrointestinal tract, marine mammals, baleen whales, μ FTIR spectroscopy

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