

MICROPLASTICS AND ORGANIC PERSISTENT CONTAMINANTS IN ODONTOCETE SPECIES: EVIDENT EXPOSURE, BUT NOT CORRELATED.

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Abstract:

Plastics materials incorporate a number of chemical compounds added to improve their performance such as plasticizers, antioxidants, flame-retardants, light and heat stabilizers, that, in some cases, make up a large proportion of the plastic product itself (Hahladakis et al., 2018; Rochman, 2015). These additives may interact biochemically and cause toxic effects, and therefore may have an impact on marine organisms and habitats (Hammer et al., 2012). Taking advantage of the opportunity provided by cetacean stranding nets to study the interaction of marine litter with cetaceans, and the previous multidisciplinary experience of the teams involved in this work, this study investigates (1) the level of plastic ingestion in stranded cetaceans (with a especial focus on microplastics, sieving the gastrointestinal contents down to 200 µm) (Montoto-Martínez et al., 2021), (2) the concentrations of organic persistent contaminants (OPCs) in the skeletal muscle of the same cetaceans. All animals (n=12) contained microplastics of diverse sizes, most of them being fibres (98.06%, n=708). The predominant pollutants bisphenols (BPS, BPF and BPA) and DEHP were detected in 94.44% and 88% of the tissue samples, with concentrations ranging 4-984 ng/g and 102-1533 ng/g respectively. Also, except for two individuals, all animals had pesticide levels in their tissues. Findings show evidence of exposure of cetaceans to both plastic fibres and OPCs. Microplastic fibres were present in numbers too low to block or compromise the functioning of the digestive tract. On the other hand, the highest OPCs concentrations were found in three dolphins that exceeded the value of 1 ppm for DDD, a toxic threshold for organohalogenated compounds in marine mammals' tissues (Letcher et al., 2010). Two of these individuals also exceeded this concentration for DEHP. Finally, no correlation was observed between the presence of microplastics and OPCs levels.

Key words: microplastics, organic persistent contaminants (OPCs), odontocete, Macaronesia.

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