



The impact of plastic debris on the health status of deep corals

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Abstract

There is an increasing interest in the impact of plastics on marine ecosystems and organisms. Most studies focus on coastal organisms although the deep-sea is now recognised as a major sink for plastic debris. Plastics particularly aggregate in submarine canyons where they represent the dominant part of the marine litter. In the Mediterranean canyons, plastic debris represent ca. 70% of the observed wastes, with macro debris concentrations reaching >1 item 100 m^{-1} . Deep-sea fauna such as gastropods, echinoderms, crabs and cold-water corals have been shown to ingest microplastics and they could be impacted by plastic pollution.

The PLAISCOOL project aimed to explore the impact of plastic wastes on the health status of emblematic deep-sea species: the reef-builders cold-water corals *Lophelia pertusa* and *Madrepora oculata*. Aquaria experiments were conducted to estimate the effects of macro- and microplastics on diverse physiological functions of corals, through an integrated approach at different levels of biological organization. It included the joint analysis of the skeletal growth processes, the feeding behaviour, the energy status of the host, and the characterisation of the associated microbiome, showing distinct effects between the experimental conditions.

The results show species-specific responses to plastic exposure. *Lophelia pertusa*, which forms the biggest reefs on the deep, appears particularly sensitive to plastic contamination. Both macro- and microplastics reduce growth rate (Chapron et al., 2018) but long-term experiments show that this species can cope with the barrier effect of large debris using an avoidance strategy, contrary to microplastics that have persistent effects.

Références

Chapron, L., Peru, E., Engler, A., Ghiglione, J.F., Meistertzheim, A.L., Pruski, A.M., Purser, A., Vétion, G., Galand, P.E., Lartaud, F., 2018. Macro- and microplastics affect cold-water corals growth, feeding and behaviour. *Sci. Rep.* 8, 15299. doi:10.1038/s41598-018-33683-6

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