
Using the pump-underway ship intake system to sample microplastics: a review

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Abstract

Marine plastic pollution has become a global issue and it is estimated that there are 24.4 trillion pieces of microplastics in the ocean. Although surface ocean floating plastic and microplastic record is well-documented in a large number of sites, there is a clear lack of standardization when it comes to sampling and analytical techniques. We present here a review on continuous microplastic sampling methodologies and results. This is an emerging continuous and fine-scale sampling methodology (complementary to the classical net and water sampling) that allows not only the detection of subsurface water plastic particles, but also addresses the patchiness of plastic particle distribution in the upper oceans. The literature review is focussing on the use of the pump-underway ship intake system to sample microplastics, taking into consideration its limitations and strengths. It aims to provide insights on this type of microplastic sampling technique. The technique consists in using an in-built pump onboard a research vessel (R/V), which continuously and automatically intakes subsurface waters during navigation, connected to a custom-built filtering device to sample microplastics at sea. Thus, it represents an affordable, accurate and continuous method, which would allow microplastic sampling to be standardized and comparable. In this context, we collected microplastics in tropical and transitional regions along a transect from Salvador (Brazil) to Cartagena (Spain) using the pump-underway ship intake system onboard the Spanish R/V Hespérides (April-May 2022), in order to study their abundance, size and polymer type in the Atlantic Ocean, and hereby present the results.

Keywords: Microplastics, Pump_underway, Review, Methodology

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