Monitoring microplastics in central Great Barrier Reef surface waters: A temporal case study at the Yongala Shipwreck

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Abstract

Plastic pollution, and specifically microplastics (< 5 mm), are ubiquitous within the marine environment, including surface waters, water column and benthic sediments. Marine plastic contamination is expected to increase if future projections of increased plastic production eventuate. In this context, scientists are increasingly interested in monitoring status of trends of microplastic pollution in the marine environment. In this study, we present results for the first three years of an on-going monitoring program to quantify microplastic contamination in surface waters of the central Great Barrier Reef, Australia. Specifically, surface seawater samples (n = 68) collected between September 2016 and September 2019 were processed for microplastic identification and quantification. Processing involved density separation followed by filtration, visual identification and sizing of putative microplastics using stereomicroscopy and ImageJ software, and chemical characterisation using Fourier transform infrared spectroscopy. A total of 845 putative microplastics were identified across all tows, consisting of fragments and fibres, with preliminary analyses indicating that polypropylene and polyethylene are the most common polymers. While microplastics were detected in every single tow, a clear temporal pattern in contamination has not been detected. This study serves as the first temporal assessment of microplastic contamination in surface waters of the Great Barrier Reef.

Keywords: Monitoring, Great Barrier Reef, Temporal Trends

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