

**MICROPLASTICS CONTAMINATION IN INDIAN BACKWATER OYSTERS  
(*MAGALLANA BILINEATA*) IN THE PANADURA ESTUARY, SRI LANKA**

**M.K.R.A.W.S.N. Nawarathna<sup>1\*</sup>, M.I.G. Rathnasuriya<sup>1</sup>, G. K. Kapukotuwa<sup>2</sup> and R.S. Rajakaruna<sup>3</sup>**

<sup>1</sup>Faculty of Fisheries and Ocean Sciences, Ocean University of Sri Lanka, Tangalle, Sri Lanka.

<sup>2</sup>Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka.

<sup>3</sup>Department of Zoology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka.  
\*snnshamila@gmail.com

Microplastics (MPs) are fragments of plastic less than 5 mm in length, and MP pollution in marine environments is widespread. As oysters are sessile filter feeders, they could serve as an indicator species of MP pollution and a proxy for marine environment contamination. The objectives of this study were to determine the effect of different depth strata and attached substrates on the level of MP contamination of the Indian backwater oyster *Magallana bilineata* in the Panadura estuary, Sri Lanka. Oysters were sampled from three depth strata (Surface to 4 m, 4–8 m, 8–12 m depth), according to their soft tissue wet weight class (0 to 4 g, 4–8 g, 8–12 g) and substrate type (natural vs plastic) in the estuary. The soft tissues of oysters were digested individually in 10% KOH, and MPs were separated using the density separation method (NaCl solution), extracted onto a filter paper (11 µm), and enumerated under the dissecting microscope. The MPs were classified according to colour and shape, and the polymer types were identified using FTIR spectroscopy. The average pieces of MPs were 5.133±4.37 items/individual, and the mean concentration was 1.212±1.188 items/g. Fibres (95%) were the dominant MPs category, and black (52%) was the dominant colour. Polypropylene, Polyethylene terephthalate, and polyvinylchloride were the predominant polymers observed in the oyster tissues. Substrate type did not affect the abundance of MPs (Two sample *t*-test;  $t=-0.33$   $p=0.743$ ); however, the depth and size of the oysters had a significant effect on the content of MPs (One-way ANOVA,  $p<0.05$ ). According to the post hoc test, the 8–12 m depth range had a higher mean content of MPs (9.78±7.26), and the weight class 8–12 g had a higher mean content of MPs (10.00±7.11). There was an interaction between two factors: depth range and weight class of oysters. The results showed that the larger the oyster and the deeper it lives, the higher the content of MPs. The results suggest that the wild-caught oysters in the Panadura estuary contained a higher number of MPs than those reported globally, with an average of 1.4 pieces per individual.

**Keywords:** Depth, Edible oysters, Microplastics, Size, Substrate