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Microplastics in Cultured Oyster, *Crassostrea madrasensis* for Human Consumption**Sathyadith W.P.J.* , Radampola K., Heenkenda H.M.E.J.**

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Abstract

Microplastics (MP) are widely distributed in the marine environment, and are generally defined as plastic particles lesser than 5 mm in size. These MPs can be ingested by various aquatic organisms, including oysters and subsequently transferred to the higher trophic levels. The primary objective of this study was to determine the quantity and types of MPs in cultured oyster (*Crassostrea madrasensis*) and, in surface-water and sediment samples from three culture sites located in Kalpitiya lagoon. This study extensively paid attention to the effect of depuration process on removing microplastics from oysters. Six out of twelve oyster samples from each site were subjected to a sixteen-hour depuration period. Both depurated and non-depurated oysters were acid digested and filtered to extract MP particles. Sediment samples from the culture sites were density separated by air venting through a super saturated calcium chloride solution. Water samples were filtered over a 63 µm mesh and treated with 30% H₂O₂. Extracted MP particles from oysters, sediment and surface-water were observed under a stereo microscope and size eligible MP particles were confirmed using FT-IR spectrometer. Microplastic concentration of non-depurated oysters was 4.0±2.4 particles per individual oyster. In depurated oysters average MP concentration was 1.1±0.6 MP particles per individual oyster. Bottom sediment samples from oyster culture sites had the highest concentrations of microplastics, which was an average of 24.5±4.2 MP particles per 1 kg of sediment dry weight and water samples with an average concentration of 7.4±1.3 MP particles per 1 L of lagoon water. Among observed MP types, fibers (74.3%) were the most common type of MPs. Depuration of oysters successfully removed 72.5% of MPs. This study reveals that, an average portion of non-depurated oysters (250 g wet weight or 12 oysters) contains approximately 50 MP particles to which the consumer will be exposed. Continuation of investigations on microplastics in different edible aquatic species are required to have a comprehensive understanding of this potential human health risk.

Keywords: Microplastics, *Crassostrea madrasensis*, Oysters, Depuration, Kalpitiya lagoon