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**Microplastics Trophic Transfer in Seafood Varieties Caught from the Coastal Waters off Negombo**

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**Abstract**

Microplastics are a pervasive global pollutant that poses risks to marine organisms including commercially important species and poses threats even to humans. However, the trophic transfer of microplastics is yet to be understood. The present study was to study the occurrence of microplastics in five species used as seafood and in zooplankton, representing different trophic levels and feeding habits caught within coastal waters off Negombo. The Negombo coastal environs are known for high ecological diversity still subjected to massive anthropogenic activities as a major fishing and tourism hub in Sri Lanka. The same area was subjected to contaminating microplastics after the MV X-Press Pearl ship disaster which caught fire and spilled the largest point source of microplastic nurdles pollution in the world. Field sampling was carried out from October to-December 2021 in Negombo, Sri Lanka. The study included zooplankton, some fish (*Sardinella gibbosa* (n=10), *Hemiramphus archipelagicus* (n=10), and *Ephippus orbis* (n=10)), crustaceans (*Scylla serrata*, (n=10)) and a bivalve (*Perna perna*, (n=10)). The samples were subjected to wet peroxide oxidation and acid digestion. Microplastic identification was conducted microscopically and confirmed with Fourier-Transform Infrared (FTIR) spectroscopy, Raman spectroscopy, and Nile red staining techniques. Microplastics were present in all the species studied except zooplankton samples. Four polymer types were identified and confirmed as Polyamide (PA), Polystyrene (PS), Polypropylene (PP), and Polycaprolactone (PCL). According to the literature, this is the first recorded PCL contamination in marine species in Sri Lanka. Fibers were the most abundant microplastic type recorded followed by fragments, films, spheres, and flakes. Red, green, blue, yellow, black, and transparent microplastics were recorded while blue colour was the most prominent. The mean number of microplastics recorded was  $0.93 \pm 0.29$  for *S. gibbosa*,  $0.97 \pm 0.17$  for *H. archipelagicus*,  $0.53 \pm 0.09$  for *E. orbis*,  $0.36 \pm 0.16$  for *S. serrata* and  $1.13 \pm 0.29$  items/g for *P. perna*. Investigation of microplastic concentrations at different trophic levels suggests that organisms at lower trophic levels are at greater risk of microplastics.

**Keywords:** Microplastics, Trophic transfer, Marine organisms, Seafood, Negombo