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Macroplastic and Microplastic Abundance at the Greenfield Mangrove Site in Guyana

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Mangroves dominate the coast of Guyana, and these ecosystems have a wide range of benefits for the country, but plastic pollution is a major environmental stressor and the impact of this stressor is not well studied. In the past decades, the use of plastic, particularly single-use plastics, has greatly increased. Guyana is among the developing countries struggling to deal with this new wave of plastic consumption, resulting in indiscriminate dumping and extensive pollution of the environment. This study was designed to determine the abundance and distribution of microplastics and macroplastics at the Greenfield mangrove site, East Coast Demerara, Guyana. The method of data collection used was a mixed method approach as the quantification of macroplastics and microplastics required different approaches. Upon using Ocean Conservancy's protocol for plastic quantification it was discovered that 98% of macroplastics found were plastic beverage bottles and 97% of the macroplastics were present at the high tide area. A modified version of the Thompson method was used to extract microplastic from twelve sediment samples. The findings revealed that the presence of microplastic was negligible. In total, 61 microplastics were found, and this is considered negligible in comparison to the total amount of plastics found in the area. The primary microplastic found was fibre, which was a result of continuous washings of plastic fabrics and tended to accumulate where macroplastic quantity was abundant. This negligible amount of microplastic can be attributed to the lack of macroplastics in the low tide and intermediate area. It is necessary to quantify these plastic levels in coastal environments such as mangroves, and further studies are needed to analyse its true impact on these ecosystems.

Keywords: Mangrove, Microplastics, Macroplastics, Abundance