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Abundance of Microplastics in Coastal Area Surface Water at Tok Bali, Kelantan.

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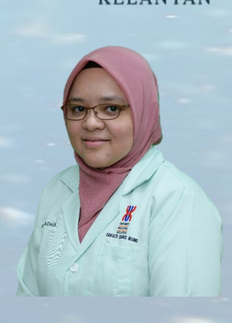
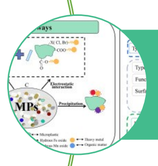


ABSTRACT

Plastic is a man-made material made up of polymers, which are long molecules structured around carbon chains. Microplastic pollution affects the environment by altering habitats and natural processes. Human activities produce plastic waste, which causes pollution to the environment. Tourism areas are one of the highly exposed areas for microplastic pollutants since a lot of activity is held. Tok Bali Beach is a tourist attraction and a resort area for residents around Tok Bali Beach. Therefore, this study is needed to assess the abundance, distribution, and characteristics of microplastics in the surface waters of Tok Bali beach, Pasir Puteh, Kelantan. In this study, 10 sampling points were selected in the beach area to determine the presence of microplastics in the surface water. Photomicroscopic examination, Fourier Transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy (SEM) were used to identify the presence of microplastics in surface seawater samples. Five types of microplastics in the surface seawater such as pellets, fibers, fragments, filaments, and films were identified in this study. Photographic microscopy revealed that flakes were the most dominant form, followed by pellets and fibers. These findings highlight the significant presence of microplastics in the surface waters of Tok Bali Beach, emphasizing the need for pollution mitigation and sustainable coastal management.

INTRODUCTION

Microplastics (MPs) are synthetic polymeric particles with a diameter of less than 5mm.

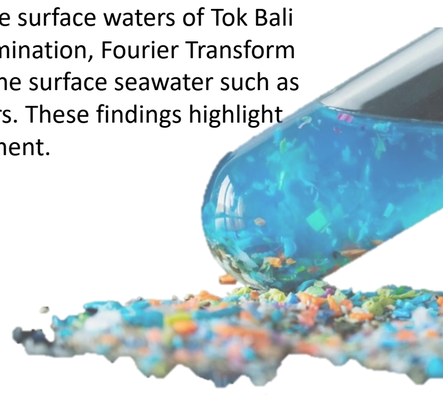


Microplastic act as a carrier capable of carrying heavy metals, organics, which form complex pollutants.

Many research efforts have documented the existence of microplastics (MP) in various natural settings, especially in aquatic ecosystems such as oceans, rivers, estuaries, lakes, Arctic waters and more.

OBJECTIVES

1. To determine the abundance and distribution of microplastics in coastal surface waters.
2. To identify the physical and chemical characterization of microplastics found in coastal surface waters.



METHODOLOGY

SAMPLING

- 10 sampling points
- 3 replicates

SAMPLE PREPARATION

- Filtration
- Drying process

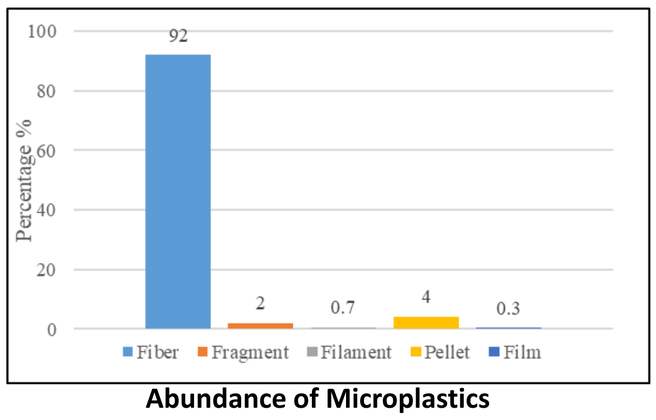
PHYSICAL CHARACTERIZATION

- Sorting
- Hot Needle Test
- Count by shape
- SEM

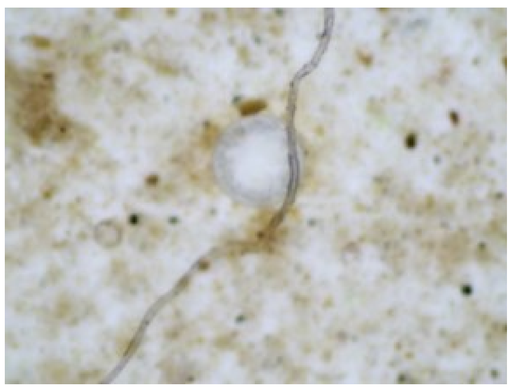
CHEMICAL CHARACTERISTIC

- FTIR

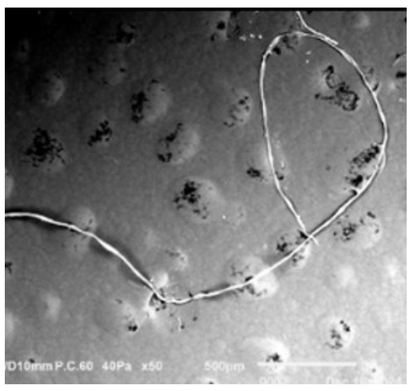
RESULTS



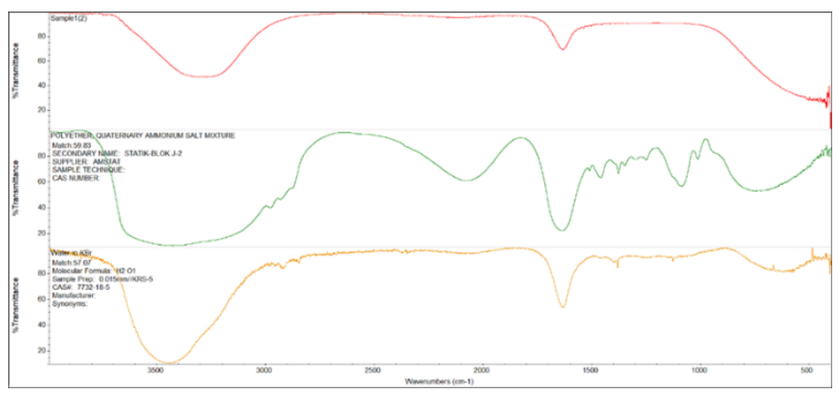
Abundance of Microplastics



Microplastic (fiber) under microscope



Microplastic (fiber) under SEM



FTIR spectra - polyether

CONCLUSION

The abundance of microplastics in water samples is an indicator for assessing the level and impact of plastic pollution around the coast.

275 microplastic particles were found in water samples taken from 10 sampling locations along 1 kilometre of coastline during this study, which was carried out at Pantai Tok Bali.

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SUSTAINABLE DEVELOPMENT GOALS