Evaluating Microplastic Contamination in Urban Impacted Coastal Zones – A Case Study of Johor, Malaysia

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Abstract:

Microplastic pollution has emerged as a growing concern in marine environments, especially in areas influenced by urban and industrial development. This study examined the presence and characteristics of microplastics (MPs) in the gastrointestinal tract (GIT) of banana shrimp (Penaeus merguiensis) collected from two coastal sites in Johor, Malaysia. Sampling was conducted between March and April 2025 at Pendas (Johor Bahru) and Pengerang (Kota Tinggi), representing urban and less urbanised environments, respectively. Although MPs are generally categorised into five types, only fibres and films were identified in the samples analysed. The recorded pH values ranged from 7.07 to 7.29, which are within the typical range for tropical coastal waters and relevant to microplastic adsorption processes. Fibres were the most dominant MP type found. Compared to Pengerang, the Pendas site recorded higher MP counts in both shrimp GIT (8 fibres) and water samples (19 fibres, 2 films), suggesting stronger urban influence. No MPs were detected in shrimp GIT or water samples from Pengerang. These results suggest that urbanisation plays a key role in influencing microplastic distribution in coastal environments and highlight the need for continued monitoring and pollution mitigation in impacted areas.

Keywords:

Microplastics, Urban pollution, Shrimp, Coastal environment.