

Barnacle analysis as a microplastic pollution bioindicator on the East Coast of Surabaya

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Abstract	<p>Background . Plastic pollution is a significant issue on the East Coast of Surabaya, emphasizing the need to develop microplastic monitoring programs. Barnacles became one of the potential microplastic bioindicator species on the East Coast of Surabaya. This study aimed to characterize the visual and polymers of microplastics found in barnacles and assess their potential as a bioindicator species for microplastic pollution on the East Coast of Surabaya. Methods . Microplastic polymer analysis was performed using ATR-FTIR. Results . A total of 196 microplastic particles were found in barnacles, water, and sediment. The size of microplastics in barnacles, water, and sediment varied, with the size in barnacles dominated by class 1 (1-10 μ m), in water by class 2 (10-50 μ m), and in sediments by class 3 (50-100 μ m). Fragments dominated the shape of microplastics in barnacles, while water and sediment were dominated by fiber. The microplastic color in barnacles, water, and sediment was dominated by blue, and the microplastic polymer composition on barnacles, water, and sediments was dominated by cellophane (36%). Amphibalanus amphitrite was found to be predominant and identified as a potential microplastic bioindicator because it is a cosmopolitan species. Its population was found to correlate positively with cellophane (CP) accumulation. The Pearson's correlation test between barnacle length and microplastic length at $\alpha = 0.05$ was inversely proportional to $r = -0.411$ ($p < 0.05$), categorized as a strong enough correlation. These findings are essential in developing monitoring programs and mitigating the impact of microplastics on the marine environment.</p>
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