

Microplastic pollution in coastal water and beaches in southern Sri Lanka

Extended Abstract

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Background

Plastic pollution has become a global environmental issue as plastic debris has reached and is found in all oceans of the world with adverse impacts on marine biota, biodiversity as well as human health (Thevenon, 2014). At present, Micro plastics in marine environment are considered as an emerging global environmental challenge for our society. Micro plastics are a key anthropogenic threat to the global oceanic ecosystems. There is a wide variety of particle sizes of plastics that are present in the environment. Micro plastics are defined as the plastic particles in the size range of 1 nm (Gesamp, 2015). It produces a wide variety of negative environmental, safety, economic, health, and cultural impacts.

Objectives

Microplastics pollution is a critical issue and it represents an unquantified threat to the marine environment, especially in southern coastal area of Sri Lanka. This study presents a baseline study on microplastics in coastal water and beaches in the southern coastal area in Sri Lanka. The objective of this study is to identify the presence of microplastics; to assess, physical classification of microplastics and to morphological characteristics quantification of microplastics to test spatial variations along the coastal belt.

Methodology

This study was conducted at ten sites along the Southern coastal belt. Sampling was carried out in the sand by serving, water using plankton nets, and grab samples of bottom sediments. Micro plastics abundance was obtained as counts and weights in both beaches and waters. Particles were

characterized by size and morphology using visual identification.

Results

According to this research, there are significant amount of microplastics along Sri Lankan southern coastal environment and it confirms the presence of micro plastics in the country. Coastal beaches show a mean abundance of 1.015 g/m² and 69.46 items per m² of micro plastics with a dominant size range of 3.5 to 4.0 mm, while water samples averaged 0.008 g/m³ and 6.79 items per/m³ Morphological characteristics provide a more detailed account as fragments are the dominant form type of micro plastics collected.

Conclusion and recommendation

The highest abundance of microplastics was typically associated with coastal beach sand texture than the surface waters at a given location. Furthermore, a strong relationship was observed between weight and count abundance as both parameters used to determine the spatial distribution of micro plastics more detailed studies on the presence and the influence of micro plastics pollution in the marine environment have to be conducted covering the most critical beaches of the country. Pollution prevention programs should focus to consider sea-based sources of microplastics, and sea-based issues, such as dumping of solid wastes and wastewater at sea, to prevent microplastics from entering the ecosystem in unprecedented bulks. Therefore, policymakers, decision-makers and environment managers, as well as the general public, have to be enlightened to cope up with this emerging threat. Therefore, a well-planned awareness program has to be implemented at the first step in order to eliminate the root causes of microplastics while educating them to cope up with the present threat of microplastics.

Keywords: Microplastics, Plastics, pollution, Marine environment, abundance

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Conclusion and recommendations

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Abstract

Plastic pollution has become a global environmental issue as plastic debris has reached and is found in all corners of the world with adverse impacts on marine biota biodiversity as well as human health (Thevenon, 2014). At present, Micro plastics in marine environment are considered as an emerging global environmental challenge for our society. Microplastics are a key anthropogenic threat to the global oceanic ecosystem. There is a wide variety of particle sizes of plastics that are present in the environment. Micro plastics are defined as the plastic particles in the size range of 1 mm diameter. It produces a wide variety of negative environmental, safety, economic, health and cultural impacts.

Objective

Microplastics pollution is a global issue and it represents an unappreciated threat to the marine environment, especially in coastal coastal area of Sri Lanka. This study presents a baseline study on microplastics in coastal water and beaches in the western coastal area in Sri Lanka. The objective of this study is to identify the presence of microplastics to assess physical characterisation of microplastics and to morphological characteristics identification of microplastics to test spatial variations along the coastal belt.

Methodology

This study was conducted at two sites along the Southern coastal belt. Sampling was carried out in the sand by sieving water using plankton net and grab samples of bottom sediments. Micro plastic abundance was observed as count and weight in both beaches and water. Further work