SCIENCE & TECHNOLOGY

NTU Study Sheds Light on the ‘Plastisphere’: Threats and Opportunities

By: Waqas Arain Published: November 29, 2023 at 8:08 am EST

A new study by Nanyang Technological University (NTU) in Singapore has unveiled a peculiar relationship between microbes, fungi, and plastic debris present on Singapore's coasts, casting light on the 'plastisphere', an ecological community formed when microorganisms colonize plastic debris in the ocean. The research, published in the recent edition of Environment International, is a significant step towards understanding the impact of the plastisphere in tropical marine environments.

The Dark Side of the Plastisphere

Amidst the colossal volume of plastic waste polluting the world's oceans, the study brings to the surface a cause for concern. The team discovered harmful microorganisms such as **Labyrinthulaceae**, linked to seagrass wasting disease, and **cyanobacteria Lyngbya**, notorious for poisoning marine life, on plastic debris. These species, potentially spread across Southeast Asia by marine plastics, could pose a threat to the region's oceanic ecosystem. Additionally, bacteria such as **Acinetobacter** and **Parvularculaceae**, associated with coral diseases, were found in abundance on plastics.

Hope Amidst the Threat

However, the study is not all gloom and doom. The researchers also identified bacteria strains like **Muricauda**, **Halomonas**, and **Brevundimonas** that could potentially eat plastic. This discovery, while preliminary, brings a glimmer of hope that these bacteria could be harnessed to accelerate the degradation of plastic waste, offering a potential solution to the growing plastic crisis.

Role of Sediments in Shaping the Plastisphere

The research further delved into the influence of sediments on the plastisphere, revealing that sediments significantly shape the microbial communities on plastics in coastal environments. This finding provides crucial insights into the factors that determine the composition of plastisphere communities.

NTU's Associate Professor Cao Bin, the lead researcher, stressed the far-reaching impacts of ocean plastic pollution, emphasizing the need for environmental policies addressing both plastic pollution and microbial ecology. The team plans to continue exploring how microbial communities vary with different types of plastics and environments, aiming to improve plastic waste management and develop eco-friendly plastic materials.

These findings highlight the urgency of tackling plastic pollution and the importance of understanding microbial ecology, intertwining the two to form an intricate tapestry of environmental conservation efforts.