

Microplastic Pollution in Bangladesh: Research and Management Needs

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Abstract

As a result of the wide-ranging applications of plastics in our daily life, microplastics, which derive primarily from the breakdown of waste plastics discarded in the environment, have become omnipresent in the terrestrial and aquatic environment, and are increasingly considered as a potentially serious threat to the biodiversity and ecosystem. Pollution of plastic debris and microplastics in the inland and marine environment has raised concerns in Bangladesh, which is the world's most densely populated country besides city states and has one of the largest river networks in the world. Compared to many parts of the world, there have been only few investigations on microplastic pollution in Bangladesh. This work summarizes the research progress on separation and characterization of microplastics, as well as their occurrence and sources in Bangladesh. Despite of the first total ban on plastic bags in the world introduced back in 2002, microplastics have been ubiquitously detected in Bangladesh's inland and marine environment, with the majority of them coming from the secondary sources. We will also discuss the



research priorities to improve the understanding on the ecotoxicological effect and fate of microplastics, the knowledge gaps to enable comprehensive risk assessment of microplastic pollution on local ecosystems and human health, and the need for effective management of plastic wastes and their recycling in Bangladesh.

Biography

Dr. Hefa Cheng holds a Ph.D. in Civil and Environmental Engineering with a Ph.D. minor in Geological and Environmental Sciences from Stanford University, and M.S. (University of Oklahoma) and B.S. (Summa Cum Laude, East China Normal University) degrees in Environmental Science. After completing his Ph.D. in 2006, he worked as a postdoctoral fellow and a consulting assistant professor at Stanford University. He joined the Guangzhou Institute of Geochemistry, Chinese Academy of Sciences (CAS) as a research professor, supported by the Outstanding Oversea Talent (“One Hundred Talents”) program of the CAS in 2009. In 2015, he moved to Peking University as a tenured associate professor of environmental science, and he was appointed as a Changjiang Young Scholar by the Ministry of Education later in the year. He was promoted to a tenured full professor and Boya Distinguished Professor in 2018. Dr. Cheng’s research interests focus on characterizing the environmental behavior of organic pollutants and heavy metals in soil and aquatic environment based on laboratory and field investigation and understanding the environmental problems arising from energy use through system analysis. He is the author/co-author of over 200 papers in SCI-indexed journals, including Nat. Clim. Change, Nat. Commun., Environ. Sci. Technol., and Wat. Res. He received the SCOPE-Zhongyu Young Scientist Award from the Scientific Committee on Problems of the Environment (SCOPE) in 2012, and the Hou Defeng Award from the Chinese Society of Mineralogy, Petrology and Geochemistry in 2014.

He was also a recipient of the National Program for Support of Top-notch Young Professionals (2012), and the Research Fund for Excellent Young Scholars from the National Natural Science Foundation (2013), and the National Natural Science Fund for Distinguished Young Scholars (2017). He currently serves as an Associate Editor of Environment International, Environmental Pollution, and Heliyon.