
Preliminary Results from a Tropical Environment on Microplastic Pollution in Agricultural Farm Soils (Klang Valley, Malaysia)

Sarva Mangala Praveena^{*†1}, Muhammad Aiman Fahim Ishak Hisham², and Ayu Lana Nafisyah³

¹Department of Environmental and Occupational Health, – Faculty Of Medicine and Health Sciences, Universiti Putra Malaysia 43400, UPM Serdang, Selangor, Malaysia, Malaysia

²Muhammad Aiman Fahim Ishak Hisham – Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, UPM Serdang, Selangor Darul Ehsan, Malaysia, Malaysia

³Ayu Lana Nafisyah – Department of Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga, Surabaya, 60115, Indonesia, Indonesia

Abstract

Plastics usage comprises one of the microplastics sources found in agricultural soil. Despite the widespread use of plastics in agriculture, there hasn't been much research on soil contamination caused by microplastics, both globally and in Malaysia. Thus, this study aims to report preliminary results of occurrence, characteristics, and potential sources of microplastics pollution in the tropical region of Klang Valley (Malaysia) from four selected organic agriculture farms. The mean number of microplastics particles found in agricultural soils at the four farms ranged from 2.1 to 3.4 particle/kg. The highest total number of microplastics particles was detected at Farm D (6.0 particle/kg) whereas the lowest number was detected at Farm B (1.5 particle/kg), which was commensurate with the plastic usage intensity at these farms. Microplastics particle sizes ranged from 16.73 μm to 1246.72 μm , which is attributed to the extensive breakdown processes at these farms. The microplastics particle shapes (film, fibre, and fragment) and colours (black, white red and blue) found in the four organic farm soil samples reflected the type of plastics products used and unmanaged plastics waste found at these farms. The microplastics sources discovered at these farms were plastic nets, mulching films, and mismanaged plastics garbage. The outcomes of this study found evidence of microplastic pollution in tropical agricultural farm tropical soils, as well as the influence of long-term plastic use in agricultural activities.

Keywords: Microplastics, Agriculture Farms, Soils, Tropical Environment

^{*}Speaker

[†]Corresponding author: smpraveena@upm.edu.my