Distribution of microplastics in soil of Seoul according to land use

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Abstract (max. 400 words)

Recently, plastic is recognized as a new source of pollution in cities due to excessive use and reckless discharge. Research on microplastics is expanding throughout all the environments. However, research about microplastics in soil is insufficient compared to other areas. Microplastics entering into the soil through various routes can stay there for a long period of time, resulting in threat to soil organisms and eventually to humans. Therefore, this study was carried out to investigate the distribution characteristics of microplastics according to land use. For this, a total of 54 soil samples were collected from agricultural land, residential area, roadside, park and forest. Analysis of the microplastics in the soil by stereo microscopy showed that the average number of microplastics (paticles/kg) in agricultural land, residential area, roadside, park and forest were 5,047 (n=11), 3,646 (n=12), 4,987 (n=10), 2,673 (n=11) and 1,097 (n=10). Various and color (black, red, green, blue, yellow, white and transparent) and shape (fragment, fiber, film and sphere) of microplastics in the soils were found. The combination of balck x fragment plastics showed the highest frequency. Microplastics in the soil samples from agricultural land, roadside, and residential area with the size between 20 μm and 500 μm were determined using FT-IR and analyzed by MP finder. The number of microplastics detected in the soil of the range between 20 μm and 500 μm was in the order of roadside > residential area > agricultural land, which was different from the results by stereomicroscopy. PE, PP, and PMMA were detected in the soils from roadside. PU, CA, PET, PP, PS, and PET were detected in the soils from residential area, with PU most frequently detected.