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ABSTRACT BOOK

Under the Auspices:



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SUSTAINABLE
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4. Soil health in achieving the Sustainable Development Goals 4.31 133628 - Micro- e nanoplastics (MNPs) in soil ecosystem

IMPACT OF MICROPLASTIC POLLUTION ON FOREST SOIL ECOSYSTEMS IN THREE LARGEST ALLUVIAL PLAINS IN SERBIA

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Microplastic (MP) pollution is recognized as one of the biggest environmental problems due to multiple direct and indirect negative impacts on the environment. Existing research indicate that the presence of MP in the soil affects the organic matter cycle and the energy flow of terrestrial ecosystems, thus also the global production of CO₂, climate, plant communities, crop production and biodiversity. There are even fewer studies dealing with the impact of MP on forest soil ecosystems. One of the first researches of the MP in the soil on the territory of Serbia is currently underway and is being carried out within the project Evaluation of the Microplastic in the Soils of Serbia - EMIPLAST - SoS. The research aimed to assess the impact of MP on soil's main chemical, physical and biological properties by comparing polluted and non-polluted forest sites in the three largest alluvial plains in Serbia – Danube, Sava and Morava. Statistically significantly higher values of electrical conductivity and pH were measured in samples from polluted localities compared to unpolluted ones; while C, N and CEC were measured significantly higher in samples from unpolluted sites. Particles > 0.02 mm were significantly higher in all samples from polluted sites compared to non-polluted. Changed environmental conditions have an effect on the decomposition by soil microorganisms. Estimates of potentially mineralizable carbon and mineralization rate are statistically significantly higher at polluted sites compared to unpolluted ones in all three alluvial plains. These results support the viewpoints that can be found in the literature, namely that the presence of MP in the soil affects the cycle of organic carbon and CO₂ emissions. Also, differences in estimates between polluted and unpolluted forest sites indicate that microbial communities may be using MP particles as an additional food source. In order to establish the level of the impact of MP on soil properties and microbial activity in the longer term, the study is ongoing.

Keywords: plastic waste, alluvial soil, soil quality, forest soils