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Impact of plastic pollution on soil biological activity in white truffle habitats in the large river plains in Serbia

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The impact of plastic pollution on forest soil biota is an emerging research area. There are knowledge gaps on a forest microbiome composition and activity as effected by wild waste deposition in forest ecosystems located on white truffle (*Tuber magnatum* Pico) habitat areas. Particles of plastic materials decompose into micro-plastic particles and are responsible for many changes in the soil physicochemical characteristics, including porosity, enzymatic activities, microbial activities, plant growth. One of the first investigations of plastic and microplastic (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 sites are located on the alluvial plains of the largest rivers in Serbia, which are the habitats of the white truffle.

Forest sites visibly polluted and non-polluted by plastic materials were sampled and analysed for soil main chemical, physical and biological properties. Potentially mineralizable soil organic carbon was measured in a long-term incubation of soil samples with sequential measurement of the emitted CO₂ flux by alkali trap method.

Preliminary results showed that some soil properties such as pH, electrical conductivity, total C and N, CEC and mechanical composition are significantly affected by the presence of plastic materials. Generally, polluted sites showed elevated microbial respiration and the rates of C mineralization. For the Danube and Morava River basin the differences were significant, while for the Sava river basin the difference wasn't significant. In order to establish the level of the negative impact of microplastics on soil properties and microbial activity in the longer term, the study is ongoing.

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