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Potential risk of microplastics transportation into ground water

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Microplastics, are plastics particles with a size smaller than 5mm. They are formed by the fragmentation of plastic wastes. They are present in the air, soil and water. But only in aquatic systems (ocean and rivers) are studies over their distribution, and the effect of microplastics on organisms. There is a lack of information of what is the distribution of microplastics in the soil, and in the ground water. This study tries to estimate the potential risk of microplastics transportation into the ground water by the activity of earthworms. Earthworms can produce burrows and/or galleries inside the soil, with the presence of earthworms some ecosystem services are enhanced, as infiltration. In this study we observed after 14 days with 5 treatments (0, 7, 28 and 60% w/w microplastics mixed with Populus nigra litter) and the anecic earthworm Lumbricus terrestris, in microcosms (3 replicas per treatment) that macroplastics are indeed deposit inside earthworms burrows, with 7% microplastics on the surface is possible to find 1.8 g.kg-1 microplastics inside the burrows, with a bioaumentation factor of 0.65. Burrows made by earthworms under 60% microplastics, are significant bigger ($p<0.05$) than the burrows of those earthworms without microplastics in their soil surface. The amount of litter that is deposit inside the burrows is significant higher ($p<0.05$) with the presence of microplastics on the surface than without microplastics. The microplastics size distribution is smaller inside the burrows than on the surface, with an abundance of particles under 63 μm.