
Interactions between earthworms and plants shape microbial communities of a constructed Technosol

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Abstract

Technosol is a recent technology based on the assemblage of technogenic materials which had started to be used for ecological remediation of polluted soil environments (Farhan et al., 2012). Little is known about the effects of earthworms in interaction with plants on the microbial communities' structure and activities. In this study, we used six different ratios of excavated deep horizons of soils (EDH) with 0, 10, 20, 30, 40 and 50% of green waste compost (GWC). Each technosol was submitted to four treatments: 1) control formed by only the different ratios of EDH and GWC, 2) with the earthworm (*Aporrectodea caliginosa*) 3) with the plant (*Lolium perenne*), and 4) with both the earthworm and the plant. After a 5 month incubation in phytotron, samples were collected to analyse the microbial communities structure and activities. To this aim, the environmental DNA was extracted and quantified, the abundance and the diversity of bacteria, fungi and archae were estimated using qPCR and T-RFLP. In addition enzymatic activities were measured as well as catabolic profiles using Biolog Ecoplates®, Results show a strong and positive correlation between the number of bacteria and the amount of compost in all technosol treatments, and also suggest an effect on the fungal diversity. The effect of *Aporrectodea caliginosa* and *Lolium perenne* were both significant on microbial activities but the effect of the latter was more important. This study provides new insight into our understanding of the influence of plant and earthworm on the microbial communities of Technosols.

Keywords: Technosol Interactions Plant Earthworm Microbial communities

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