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Early colonization of constructed Technosols by microarthropods

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One third of the soil of the world is moderately or severely degraded. At the same time, the continuous use of natural resources produces a large amount of waste materials. Recycling waste material in order to create Technosols is now considered as an appealing ecological and economic opportunity. Recent studies highlighted that Technosols can attract and host a large part of soil organisms, being an important reserve of biodiversity. Thus, the aim of this study is to investigate the early colonization (4 years) of constructed Technosols supporting meadow vegetation, by microarthropod community. The hypothesis behind is that, after 4 years, the microarthropod community structure will be similar to a typical grassland community.

Technosol has been built using three distinct technogenic parent materials: paper-mill sludge (PS), thermally-treated industrial soil (TIS) and green-waste compost (GWC). In order to establish a meadow, a mixture of grass plants were seeded in November 2007. Surface soil (5 cm deep, 5 cm diameter) was sampled for microarthropods in the first half of April of each year (2008 to 2011). Microarthropods were separated into 3 groups: Acari, Collembola and other microarthropods, and collembolans were identified at the species level. To study colonisation pathways along years, we conducted a functional trait-based approach using several functional traits, extracted from the BETSI database (<http://betsi.cesab.org/>).

Total microarthropod and collembolan densities increased significantly from the first year to the last year, changing also in species assemblages. Functional structure and composition of collembolan communities varied during the colonization. The functional richness significantly increased in the last year compared to the first year. However, after four years of experimentation microarthropod taxonomical and functional composition greatly differentiated from those found in other soils (meadow, forest or arable land), rejecting the hypothesis and suggesting that the community was still not mature.

Si prega di indicare la sessione desiderata ed il tipo di contributo spuntando le relative caselle

Sessione

- S-1 Capitale Naturale, Well-being e Stress Ecology
- S-2 Capitale Naturale ed Ecosistemi Terrestri
- S-3 Capitale Naturale ed Ecosistemi Marini ed Oceanici
- S-4 Capitale Naturale ed Ecosistemi Lagunari o di Transizione
- S-5 Capitale Naturale ed Ecosistemi delle Acque Interne
- S-6 Capitale Naturale e Contabilità Ambientale

Tipo di contributo

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