



Effects of a constructed Technosol on mortality, survival and reproduction of earthworms

Benjamin Pey (1), Jerome Cortet (1), Yvan Capowiez (2), Lenaic Mignot (1), Johanne Nahmani (3), Françoise Watteau (1), and Christophe Schwartz (1)

(1) Nancy Université, ENSAIA, Laboratoire Sols et Environnement, Vandoeuvre-les-Nancy, France (jerome.cortet@ensaia.inpl-nancy.fr, +33 3 83 59 57 91), (2) Université d'Avignon et des Pays de Vaucluse, UMR INRA 406, Site Agroparc, 84914 Avignon cedex 09, (3) Université Paul Verlaine-Metz, LIEBE, UMR CNRS 7146, Campus Bridoux, rue du général Delestraint 57070 Metz

Soils, whose properties and pedogenesis are dominated by artificial materials or transported materials, are classified as Technosols. Some of these Technosols are used in soil engineering, which is the voluntary action to combine technical materials in a given objective to restore an ecosystem. Primary by products that are used to build these Technosols need to be assessed on an ecotoxicological point of view. The following study aims to assess the effects of a constructed Technosol made from different primary by-products on the mortality, survival and reproductions of two earthworm species.

The model of Technosol used here is a combination of green-waste compost (GWC) and papermill sludge (PS) mixed with thermally treated industrial soil (TIS). OECD soil is used as a control soil. Three different experiments have been managed: i) the first, to assess the potential toxicity effect on *Eisenia foetida* biomass (28 days) and reproduction (56 days), ii) the second to assess the short-term effect (7 days) on *Lumbricus terrestris* biomass, iii) and the third to assess the medium-term effect (30 days) on *L. terrestris* biomass.

Reproduction of *E. foetida* is enhanced with high proportions of GWC. For biomass, GWC seems to improve body mass contrary to other materials which lead to losses of body mass. Thus, for *E. foetida*, GWC seems to be a high-quality and long-term source of food. Body mass of *L. terrestris* decreased with GWC and OECD. At short-term only, TIS/PS leads to a gain of body mass. Only equilibrium of 25% GWC – 75% TIS/PS allows a gain of body mass at medium term. TIS/PS appears to be a low-quality and short-term food resource but an excellent water tank.

It can be concluded that the constructed Technosol is not toxic for fauna but some differences appear between different tested material combinations, depending on nature, proportion and trophic properties of materials.