Effects of sludge and municipal solid waste composts disposal on earthworm communities under crop field conditions

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THE 8th INTERNATIONAL SYMPOSIUM ON EARTHWORM ECOLOGY

The Symposium will be held in Poland in Kraków, at the Jagiellonian University at the Institute of Environmental Sciences.
From 4th to 9th of September 2006

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Abstract:
Before using different solid waste composts at large scale in agricultural fields, it is necessary to prove that these composts do not have harmful effects on soil fauna, especially on earthworms that play important roles in the soil ecosystem. A study was carried out the effect of two particular composts (a municipal solid waste compost (OMG) and a sludge compost (DVB)) on earthworm communities under field conditions. This study was conducted on the "QualiAgro" site (near Paris, France), an agricultural field where these composts are disposed every two years since 6 years and compared to controls (with (T+N) or without (TSA) N fertilisation). Earthworm communities were sampled in each treatment at different dates (a month before and then 2, 7, 9 and 13 months after) using mustard extraction followed by a manual sorting. Avoidance tests were carried out under laboratory conditions to determine whether earthworm surface migrations between treatments occurred. OMG had significant and lasting effects increasing earthworm abundances and biomass whereas DVB had limited and transitory positive effects (Figure 1). No effect was observed on species distribution except for TSA where less *L. terrestris* were sampled (Figure 2). The positive effects observed on abundance were not due to either (i) difference in the number of immature earthworms or to avoidance/attraction of soils with composts (Table 3). Moreover we found that in OMG (and DVB for one of the date), adults of *A. caliginosa* species had higher weights. Globally only positive effect on earthworm communities after disposal of these composts were observed. However only OMG seems to have effects that last between two successive disposals.

(poster)