



Toxic industrial deposit remediation by ant activity

Veronika Jilkova (1) and Jan Frouz (1,2)

(1) Institute of Soil Biology, Biology Centre, CAS, Ceske Budejovice, Czech Republic, (2) Institute for Environmental Studies, Charles University, Prague, Czech Republic

Toxic industrial deposits are often contaminated by heavy metals and the substrates have low pH values. In such systems, soil development is thus slowed down by high toxicity and acidic conditions which are unfavourable to soil fauna. Ants (Hymenoptera, Formicidae) are considered tolerant to heavy metal pollution and are known to increase organic matter content and microbial activity in their nests. Here, we focused on soil remediation caused by three ant species (*Formica sanguinea*, *Lasius niger*, and *Tetramorium* sp.) in an ore-washery sedimentation basin near Chvaletice (Czech Republic). Soil samples were taken from the centre of ant nests and from the nest surroundings (>3 m from nests). Samples were then analyzed for microbial activity and biomass and contents of organic matter and nutrients. As a result, ant species that most influenced soil properties was *F. sanguinea* as there were higher microbial activity and total nitrogen and ammonia contents in ant nests than in the surrounding soil. We expected such a result because *F. sanguinea* builds conspicuous large nests and is a carnivorous species that brings substantial amounts of nitrogen in insect prey to their nests. Effects of the other two ant species might be lower because of smaller nests and different feeding habits as they rely mainly on honeydew from aphids or on plant seeds that do not contain much nutrients.