Abstract

Earlier research on the spontaneous succession on spoil heaps near Sokolov, NW Bohemia, has documented major changes in vegetation during middle successional stages, that correspond with occurence of some groups of soil macrofauna (earthworms and wireworms - Elaterid beetle larvae). We have tested the interactions between these soil animal groups, plants and soil in several experiments:

In two laboratory and two field experiments earthworms positively affected growth of late successional plants (*Arrhenatherum elatius, Agrostis capillaris, Centaurea jacea, Festuca rubra, Plantago lanceolata, Lotus corniculatus,* and *Trifolium* spp.), during the laboratory experiments a decrease in soil pH and increase in microbial respiration, oxidable C, total N, and exchangeable P, K, and Ca content was detected in presence of earthworms. In a laboratory experiment earthworms also negatively affected germination of small seeds in comparison with large seeds. Concurrently, earthworm performance is affected by the biotic and abiotic conditions at the site; their biomass increased when kept in pots at sites 28 and 48 years old with high tree coverage and decreased in pots at younger sites.

Wireworms negatively affected biomass of *Calamagrostis epigejos* in both laboratory and field experiment, their reduction in field also caused a change in whole plant community composition; in the laboratory experiment wireworms positively affected growth of late successional grass *F. rubra*.

This infers that colonization of spoil heaps by soil macrofauna during natural succession may affect on the whole plant community and consequently development of the whole ecosystem.