Abstract

Succession is often studied by using a chronosequence. When using a chronosequence we study a set of sites with different ages at the same time and by comparing them we conclude what kind of changes occurred during time (space for time substitution). Only a few studies however compare how results obtained by using a chronosequence differ from those obtained by long-term studies. In my theses I repeated a study that investigated succession of ant communities on brown coal mining spoil dumps in Sokolov district after 19 years. There are chronosequences of two types of sites (spontaneous succession and recultivation) in Sokolov coal mining district. By repeating the original study I could compare changes that occurred during time with changes along a chronosequnce. Relationship between occurrence of ant groups with different ecological requirements and age of site was also investigated. RDA model and variation partitioning were used to find out statistical significance between sites and their age.

An increase in number of species was recorded on the spoil dumps. 22 ant species were found in the year 2020, from which 5 species were new on the dumps. All the new species are specialists, two of them are dendrophilous. A statistically significant increase in abundance of forest species with site age was found. There was statistical significance between abundance of other specialists and habitat characteristics, higher abundance was found on spontaneous succession sites. An increase of abundance of these species was highest on 20-30 years old sites. The most numerous were eurytopic species however, their abundance was one or two orders of magnitude higher than abundance of specialists. The results of PCA analysis showed correlation between presence of dendrophilous species with canopy and presence of dead wood. Presence of species preferring open habitats correlated with moss and herb cover and with depth of fermentation layer. Statistically significant interaction between site characteristics and their age was shown by RDA model. Results from variation partitioning showed that age explained 99,9% of variation explained by combination of habitat characteristics and age. Found successional changes of ant communities on Sokolov coal mining district dumps obtained by chronosequences were comparable with results obtain by long-term study. Use of chronosequences (space for time substitution) thus represents suitable alternative to long-term studies.

Key words: ants, chronosequence, succession, spoil dump, coal mining, Northwestern Bohemia