

Abstract***Monitoring ant communities (Hymenoptera: Formicidae):
Central European experiences**

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One of the most important tasks of contemporary nature conservation is to monitor the man-induced and natural state transformations in different habitats and in their biota. There are two main philosophies of monitoring. By the first one animals or plants are used as instruments to detect the changes in their environment. The second is a more ecological approach, where the states of the populations and / or communities are in the focus of monitoring and the correlated environmental conditions are interesting only as background factors. The first approach classifies living creatures as "good" or "bad" indicators, but the general indication theory says that every ecological unit is the best indicator of its own environment. It is another question if their indication properties can be employed for a particular aim. Ants are regarded as one of the useful reference groups in monitoring because of the simple sampling procedure, relatively low sampling effort and their ecological indication properties (AGOSTI & al. 2000, ANDERSEN & MAJER 2004, ANDERSEN & al. 2004). In the majority of myrmecological studies, the second monitoring approach is used and the main question is, if ants were regarded as umbrella or surrogate group, which well represents the other components of the entire community. Our studies, mainly carried out in the Pannonian Region, resulted in the following findings: (1) Ants are middle-sensitive indicators of habitat heterogeneity as compared to other assemblages. Although their reaction to the environmental conditions of the different habitat patches is strong, they have larger space demands, therefore they perform a "fine-grained response" to the very small scale patchiness. (2) At a larger scale ants detect the landscape structure likewise at medium sensitivity as compared to other assemblages. (3) At landscape level, in flood plains, ants perform the highest proportion of positive correlations of species diversity with other groups and their habitat distance values are likewise well corre-

lated with others. (4) At smaller scale landscapes, i.e., successional sand dune complexes, however, ant communities are correlated only with the architecture of vegetation and soil fauna composition. (5) The primary and secondary successional series are well distinguished by ant assemblage composition. (6) The ant communities are sensitive indicators of irregular inundations and well adapted to regular floods. (7) They are especially sensitive to soil disturbances by game. (8) The diversity of ant assemblage does not correlate with the reaction of other communities to different experimentally induced disturbances (fertilization, topsoil removal, cutting, spraying, grazing). (9) Ant community structure is a good indicator of climate change.

Our main conclusion is that ants are important objects in any terrestrial ecological monitoring program, but there is restricted possibility to employ them as umbrella group.

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