

3. Biological soil crusts on anthropogenic substrata – species composition and diversity

JIŘÍ NEUSTUPA

In Central European landscape, sedimentation basins represent a principal habitat with biological soil crusts (Kovář 2004). Most of these localities arose from ore mining in the second half of the 20th century. As a result, the substrates of sedimentation basins typically have high concentrations of metals and heavy metal toxic elements and relatively low pH (Rauch 2004; chapter 3.2). These abiotic factors effectively hamper the succession of vascular plant cover, so that relatively large parts of sedimentation basins have resisted past restoration actions, typically involving the planting of several species of tree seedlings (Kovář 2004). The relatively scarce vascular plant cover consists of just a few species (chapter 3.3) and the total cover mostly does not exceed 15%. Thus, the competition of vascular plants is highly limited and most of the surface is covered by typical biological soil crust as defined by Johnston (1997).

In this part of the project, we aimed at the enumeration of species composition from several sedimentation basin localities with a well developed biological soil crust. In addition, we investigated two active cinder-washery basin localities (the Ostrov and Dvůr Králové sampling sites). In this locality, we sampled the surface cover of a substrate in order to compare the biotic components of this site with typical crusts of other sedimentation localities.

For characterization of our localities, we measured numerous abiotic data involving basic physico-chemical parameters, concentrations of several microbiogenous elements, concentrations of heavy metal elements, nutrient concentrations and several eco-physiological parameters of crusts. In the following chapters, we present our results of biodiversity investigations, we compare the species compositions of individual investigated sedimentation basins, and we identify the abiotic factors that significantly influence the biotic components of crusts. Regarding the extremely low diversity of bryophytes at the investigated localities, this chapter includes additional data on population dynamics of dominant taxa on linear transects in relation to humidity on investigated localities. On the other hand, in more diversified microbial groups we concentrated more on investigation of species richness and comparison of species composition data between individual localities.