

Methods of Post-Mining Landscape Reclamation and Their Impact on Occurrence Hymenoptera: Aculeata and Lepidoptera

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Abstract : This study is focused on two selected model taxa of invertebrates - Hymenoptera: Aculeata and Lepidoptera with nocturnal activity, recorded at the sites of lignite dumps and their surroundings in the North Bohemian Lignite Basin, Czech Republic. The search was conducted on 10 landfills, 3 study areas were determined on each landfill - primary and secondary succession and recultivation. A total of 3,202 individuals belonging to 232 species and 17 families of sawfly insects were collected. 74% of the species occurred on the primary succession areas, that is 2x more species than on the reclaimed areas. Of the total number of species and on all areas, 60 rare species were recorded - 29 vulnerable, 21 endangered, 8 critically endangered, and 2 extinct. The areas of primary succession were again confirmed to be the richest in terms of rare species, hosting 39 rare species of Hymenoptera: Aculeata. In addition, both extinct species were represented only on plots of primary succession. The family Crabronidae had the largest representation of species on the areas of primary succession, the family Halictidae was the most represented on the reclaimed areas and areas of secondary succession. A total of 3,634 moths were collected, assigned to 262 species and 10 families. A similar number of species occurred on the primary succession and reclaimed areas, but the reclaimed area had a greater abundance. Secondary succession sites hosted half as many species and also contained low abundance compared to other management types. The results show that reclaimed areas host a numerically larger group and more species of moths than the successional areas. Rare species did not occur at any site. A higher number of days in locations without water bodies, wetland vegetation, and locations with a high representation of woody species. It is advisable to combine individual types of landscape management in such a way as to create a colorful mosaic that supports biodiversity. In particular, we recommend incorporating natural succession into reclamation plans, which is a refuge for many rare species of invertebrates, which has not yet been routinely and purposefully practiced.

Keywords : hymenoptera: aculeata, lepidoptera, reclamation, succession, post-mining area

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