Responses of Auchenorrhyncha and Heteroptera communities to restoration of species-rich grasslands in the White Carpathians (Czech Republic)

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The White Carpathians (= Bílé Karpaty), a UNESCO Biosphere Reserve situated in the eastern part of the Czech Republic, harbours large areas of well-preserved semi-natural grasslands. Local hay meadows belong to the most-species rich plant communities in the world. During the second half of the 20th century many meadows and pastures were turned into arable land. Since 1980's there has been a growing effort to restore them through spontaneous succession and sowing of commercial (species-poor, containing several grass species) and regional (species-rich, composed of ca. 20–30 local herb and grass species) mixtures.

In two projects in 2012–2014, we surveyed insect communities including Auchenorrhyncha and Heteroptera in restored and original species-rich grasslands to assess their biodiversity and restoration success in newly re-created grasslands. Insects were collected with sweep netting (3 sampling dates/season) and vegetation and soil data were recorded.

In the first project, we compared 16 pairs of plots, each composed of a site of ex-arable land restored (5–13 years ago) with the regional species-rich seed mixture and the nearest patch of a well-preserved (original) species-rich grassland as a reference site. Both Auchenorrhyncha and Heteroptera assemblages in the restored sites did not significantly differ in their total number of species, individuals, and threatened species, as well as generalist/specialist ratio from the reference sites which suggests a rapid colonization of the restored grasslands. However, there was a significant difference in species composition of the assemblages between the two types of grasslands, reflecting a difference in the vegetation cover, associated with the occurrence of some xerothermophilous species and the absence of some specialized tall grass and dicotyledon herb feeders.

In the second project, we compared 17 sites of grasslands restored 8–25 years ago with different methods and well-preserved original grasslands as reference sites. Number of Auchenorrhyncha species and individuals did not significantly differ among all types of sites while the species richness and abundance of Heteroptera were lower in sites sown with regional species-rich mixture compared to other types of plots. Multivariate analysis of species data showed that both Auchenorrhyncha and Heteroptera assemblages of restored sites differed in their species composition from the reference sites.

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