

“River phenomenon” in the Czech Republic

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In the middle elevations of the Czech Republic, deeply incised river valleys form distinct geomorphological feature, with steep slopes and sharp upper edges contrasting to the otherwise flat or softly undulating surrounding landscape. Most of these valleys are of late Tertiary and early Quaternary origin, when the uplift of the Bohemian Massif resulted into increased erosion power of rivers (Kopecký 1996). Geomorphology of these valleys was further shaped during Pleistocene periods of glaciation, when intensive frost weathering occurred as a result of periglacial climate (Kopecký 1996). Main abiotic features of these valleys are related to rugged topography and specific microclimatic conditions: steep slopes with exposed rocky outcrops, diversity of landform shapes, variability in slope aspect with sharp contrast between warm south and cold north facing slopes, and also frequent temperature inversions, resulting from the valley shape and pronouncing the contrast between cold and wet valley bottom and dry continental upper valley edges. Important biotic consequences of these features are (1) high diversity concentrated in these valleys due to concentration of various, often ecologically contrasting habitats, (2) occurrence of relict species, reflecting the role of valleys as a refuge during glacial and postglacial period, (3) function of river valley as migration corridors between mountains and lowlands, with migration of both downstream and upstream direction (the latter facilitated due to the frequent occurrence of suitable dry and warm habitats within the valleys in higher altitude), and finally also (4) conservation of vegetation less affected by human activities in hardly accessible sections of the valleys. Specific features of the vegetation pattern in these valleys were summarized under the heading “river phenomenon” in the descriptions provided by Czech vegetation scientists in the 1960’s (Blažková 1964; Jeník & Slavíková 1964). Concentration of strong ecological gradients within limited space of the valley together with the fact, that these valleys are the main source of the topographical heterogeneity in the middle elevations of the Czech Republic, makes them an interesting model for studies searching for environmental correlates of vegetation and plant diversity patterns at the landscape scale.

