

Effect of environmental variables on macrophyte assemblages were studied in 97 small and medium-sized rivers in two bioregions (Pannonian and Carpathian) in Slovakia during three years (2013–2016). In total, 153 species were determined (100 vascular plants, 36 bryophytes and 17 macro-algal growths); 106 taxa and 113 taxa in the Pannonian and the Carpathian bioregion, respectively. The floristic composition of the studied bioregions varies and is influenced by several sets of environmental variables. Macrophyte vegetation in the Pannonian bioregion is influenced by altitude, width of the river bed, flow velocity and water reaction (explaining 16.3% of variability), whilst mesolihal, depth of water, shading by trees, concentration of total phosphorus in water and altitude (21.9%) drive species composition in the Carpathians. Similarly to overall species composition, the distribution pattern of alien and endangered species differs between bioregions. In the Carpathian bioregion, endangered species are concentrated in two groups (vascular vs. non-vascular plants) according to the width of the river bed and flow velocity. In contrast, all evaluated species groups (endangered, alien and other species) have scattered distribution in the Pannonian bioregion. Two endangered species, *Butomus umbellatus* and *Berula erecta*, exceed the frequency of 20% only in the Pannonian bioregion. On the other hand, the frequency of 10% is exceeded by two alien species, *Elodea canadensis* in the Pannonian bioregion and *Impatiens glandulifera* in the Carpathian bioregion. In conclusion, monitoring of aquatic macrophytes, including endangered and alien species, provides valuable information usable in ecological assessment.

