

Composition, distribution and ecology of Plecoptera (Insecta) in Bulgaria

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Summary

This work presents the first generalized research on species composition, distribution and ecology of the stonefly fauna (Plecoptera: Insecta) in Bulgaria. The first UTM grid mapping of species distribution and evaluation of the protection status of all stoneflies were made. Bulgarian stoneflies fauna includes 108 taxa (91 species and 17 subspecies), belonging to 23 genera and 7 families. *Brachyptera beali beali* (Navás, 1923) is new to the Bulgarian fauna. Furthermore, 33 species are new to the fauna of different regions and rivers. Stoneflies are the most sensitive order of aquatic insects. The current status of endemic and rare stoneflies communities in Bulgaria includes 10 Bulgarian, 22 Balkan endemics and 38 rare species. One species is regionally extinct (RE) from the country, 26 – critically endangered (CR), 10 – endangered (EN) and 18 are vulnerable (VU). From a zoogeographical point of view, the Bulgarian stoneflies fauna is determined by Palaearctic and European species (63.89%) and its local character – by endemics (29.6%).

This survey also contains information on the general distribution, the zoogeographic affinities and environmental preferences of the stonefly species in Bulgarian ecoregions and river types. The highest species diversity (87.04%) has been determined in the montane areas, while the poorest species diversity – in the plane areas (21.3%). The greatest similarity was found between the stoneflies communities in montane and submontane areas.

The correlations of stoneflies species with corresponding environmental data were analyzed using different statistical analyses – PCA, CA, RDA, ANOVA and Pearson correlation. A large majority of environmental factors showed significant correlations, but the strongest were those with the substrate types, altitude, temperature, river flow and oxygen content. Plecoptera species require clean, cool, well-oxygenated water and prefer stone or gravel substrate in epi- and metarhithral zones (between 800 m and 1500 m a. s. l.). Stoneflies are used as good indicators of water purity.

Faunistic and environmental information of the Bulgarian stoneflies, as a part of European freshwater taxa is valuable in the development and testing of integrated assessments of environmental quality and integrity of freshwater ecosystems in Europe.