

The Pattern of Earthworm Diversity on the Western Slopes of Kopaonik Mountain in Serbia: An Empirical Test of Rapoport's Altitudinal Rule [†]

Filip Popovic *, Mirjana Stojanović, Tanja Trakić and Jovana Sekulić

* Correspondence: fillip.popovic@pmf.kg.ac.rs

Abstract: The pattern of earthworm diversity along altitudinal gradients was rarely investigated. The aim of this study is to examine the patterns of earthworm diversity at on western slopes of the Kopaonik Mountain. Earthworm was sampled within four months in both 2018 and 2019 (from April to July). In total, 30 plots at altitudinal transects (between 420 and 1950 m a.s.l.) were sampled within two years' fieldwork. Overall, 27 earthworm species belonging to 11 genera were found at the study sites. A combination of Pearson's correlation, linear regression and cluster analysis (UP-GMA) were used for determining the effects of altitude on the earthworm diversity. Essentially, we found monotonically declining relationships between total abundance/species richness and altitudinal gradients (from 14 to 6 species, and from 118 to 39 individuals). Cluster analysis revealed two patterns of earthworm community composition, one that characterizes lower altitude (up to 1000 m) and one that observed at the middle and higher altitude (from the 1000 m). Nevertheless, a major number of taxa with broader ecological tolerances which mean altitudinal range increased with increasing altitudes and thus supported the Rapoport's altitudinal rule, was observed. Overall, this study has provided new insights into the understanding of the effect of altitude on earthworm diversity.

Keywords: earthworm; altitudes; abundance; species richness; Rapoport's altitudinal rule

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