



Conference Abstract

Global correlates of diversity in aquatic subterranean fauna

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Abstract

Subterranean aquatic systems are island-like habitats spread all over the world consisting of many caves linked by a common geological history but displaying different ecological parameters (e.g. distance to the sea, topography, depth). Therefore, they comprise numerous, discrete, and varied entities that facilitate independent colonization events by epigeal biota, providing many replicates of comparable evolutionary processes. The data produced over the past 100 years of research collectively indicates that subterranean aquatic systems harbor a high percentage of local endemism and disharmonic animal communities when comparing them to surrounding epigeal environments. However, it remains unclear whether those are general trends, or whether confounding effects such as sampling bias may produce misleading results. We investigate these two problems by analyzing a global dataset of ca. 50,000 records for ca. 4,000 species in 2,000 caves with two goals.

1. We search for global correlates of diversity in cave aquatic animals by testing the effect of ecological and geological parameters on the number of species, species composition and functional diversity in each cave and subterranean system;
2. We account for the influence of sampling intensity on the analyses by including the number of samples and number of published papers explicitly in the analyses.

The highest species diversity was found in the Caribbean and Mediterranean basins: two areas with many caves covering a wide range of ecological conditions, as both basins

include marine, anchialine and freshwater subterranean habitats. However, the number of papers per area explained a high proportion of the variation observed of our data, with a taxonomical bias favoring crustaceans. Our results indicate that sampling bias should be carefully considered when drawing conclusions from large-scale analyses, and that we still need further sampling, especially in groups different to crustaceans, to better understand the generality of the processes driving global patterns in subterranean biodiversity.

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