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**Project title: Changes in α-, β-, and γ-diversity of aquatic macroinvertebrates in Europe**

Aquatic invasive species are a substantial threat to native biodiversity worldwide and can have major impacts on ecosystem functioning and services. They are often able to adapt, competitive, and opportunistic, and can be highly destructive to native species. Many factors contribute to the success of aquatic invasions, including the specific habitat requirements, species-specific traits of aquatic invasive species, pathways and vectors that can facilitate their spread.. Despite this understanding, little is known about the similarities in regional alien species communities or the factors that contribute to the formation of these patterns. In addition, changes in alien species compositions over time due to anthropogenic or environmental stressors have not been adequately explored (yet). To address these knowledge gaps, we propose a project to investigate temporal trends in the taxonomic alpha, beta, and gamma diversity of aquatic macroinvertebrates communities across Europe and in specific European regions. Using a recently compiled time series database for this group, we will identify the presence of alien species and analyse the trends in alpha, beta, and gamma diversity over time. We expect to find spatial patterns in southern, central, and northern Europe and will conduct a series of spatial analyses, including ordination (e.g. Redundancy analysis) and spatial regression, to understand these differences in alpha, beta, and gamma diversity. Overall, this project will aim to provide new insights into the invasion dynamics of aquatic species in Europe and inform management efforts to mitigate the negative impacts of these invasions. By understanding the factors that contribute to the success of aquatic invasive species and the trends in their diversity, we can better predict and prevent future invasions, ultimately contributing to the conservation of native biodiversity.

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