Species sorting drives variation of boreal lake and river macrophyte communities (Alahuhta et al. 2015) [1]

Metacommunity paradigms are increasingly studied to explain how environmental control and spatial patterns determine variation in community composition. However, the relative importance of these patterns on biological assemblages among different habitats is not well known. We investigated the relative roles of local, catchment and spatial variables based on overland and watercourse distances in explaining the variation of community structure of lake and river macrophytes in two large river basins at two spatial extents (within and across river basins).

Partial redundancy analysis was used to explore the share of variability in macrophyte communities attributable to local environmental conditions, catchment land cover and space (generated with Principle Coordinates of Neighbour Matrices). We found that local variables had the highest effect on both lake and river macrophyte communities, followed by catchment variables. Space had no or only marginal influence on the community structure regardless of used distance measure. Total phosphorus, conductivity and turbidity of the local variables contributed most for lake macrophytes, whereas pH and color had largest independent contribution for variation in river macrophytes. Size of catchment area and proportion of lakes and agriculture were the most important catchment variables in both habitats. The strong importance of environmental control suggests that both lake and river macrophyte communities are structured by species sorting. This finding gives support to the validity of assessment systems based on the European Water Framework Directive.

Keywords: Aquatic plants, Dispersal, Finland, Euclidean distances, Metacommunity dynamics, Overland distances, Principle Coordinates of Neighbour Matrices, Spatial processes, Space, Stream networks

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Link to DOI:

http://dx.doi.org.ezproxy.library.wur.nl/10.1556/168.2015.16.1.9 [2]

Links
[1] https://reformrivers.eu/species-sorting-drives-variation-boreal-lake-and-river-macrophyte-communities-alahuhta-et-al-2015
[2] http://dx.doi.org.ezproxy.library.wur.nl/10.1556/168.2015.16.1.9

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