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Mahjonging key functional and taxonomic tiles in near-natural Mediterranean riparian woods (SW Iberia, Portugal)

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Studies on the ecology of riparian woody vegetation in Portugal are few in number and mostly small-scaled. This study aims to gain understanding of spatial distribution of the riparian woods using the analysis of congruence of taxonomy (species) and functional trait approaches.

Based on 175 surveys of river stretches with no or minor anthropogenic disturbances undertaken in 2004–2005, hierarchical classification was done to derive Taxonomic Species Groups (TSG) and Functional Trait Groups (FTG). The latter were defined after the identification of ecological meaningful Emergent Groups (EG). An Indicator Species Analysis was used to identify the key-woody species and the key-functional traits, respectively. Discriminant analyses were used to create predictive models. The contribution of FTG to the overall spatial variation of TSG was analysed.

Four TSG were identified, such as alder woodlands, ash woodlands, mountain shrublands and semi-arid shrublands. The ash and alder woodlands were widely distributed, in contrast to the shrubland formations. Thirty-one relevant plant traits were used to derive EG. Four FTG were defined, such as mixed woodlands dominated by waterlogging tolerators, mixed woodlands abundant in half-shade tolerators, evergreen anemochourous shrublands, and shrublands dominated by drought tolerants. The TSG and FTG approaches agreed closely in the extremes of the climatic gradient, with the semi-arid shrublands of small torrential rivers being congruent with the shrublands dominated by drought tolerants, and the mountain shrublands in small headwater permanent rivers with the evergreen anemochorous shrublands.

The TSG and FTG were primary driven by hydrological features, followed by broad geographical variables. TS-based approach wwas more strongly related with the environmental setting than was the FT-based approach. However the latter was able to highlight small local variations indirectly related to human disturbance. The two approaches used thus contributed synergistically to our understanding of the spatial variation of riparian woodlands and our ability to detect environmental and landscape changes.