

# Effect of dominant riparian vegetation on the presence and abundance of invasive alien plants in the riparian areas of Serbia

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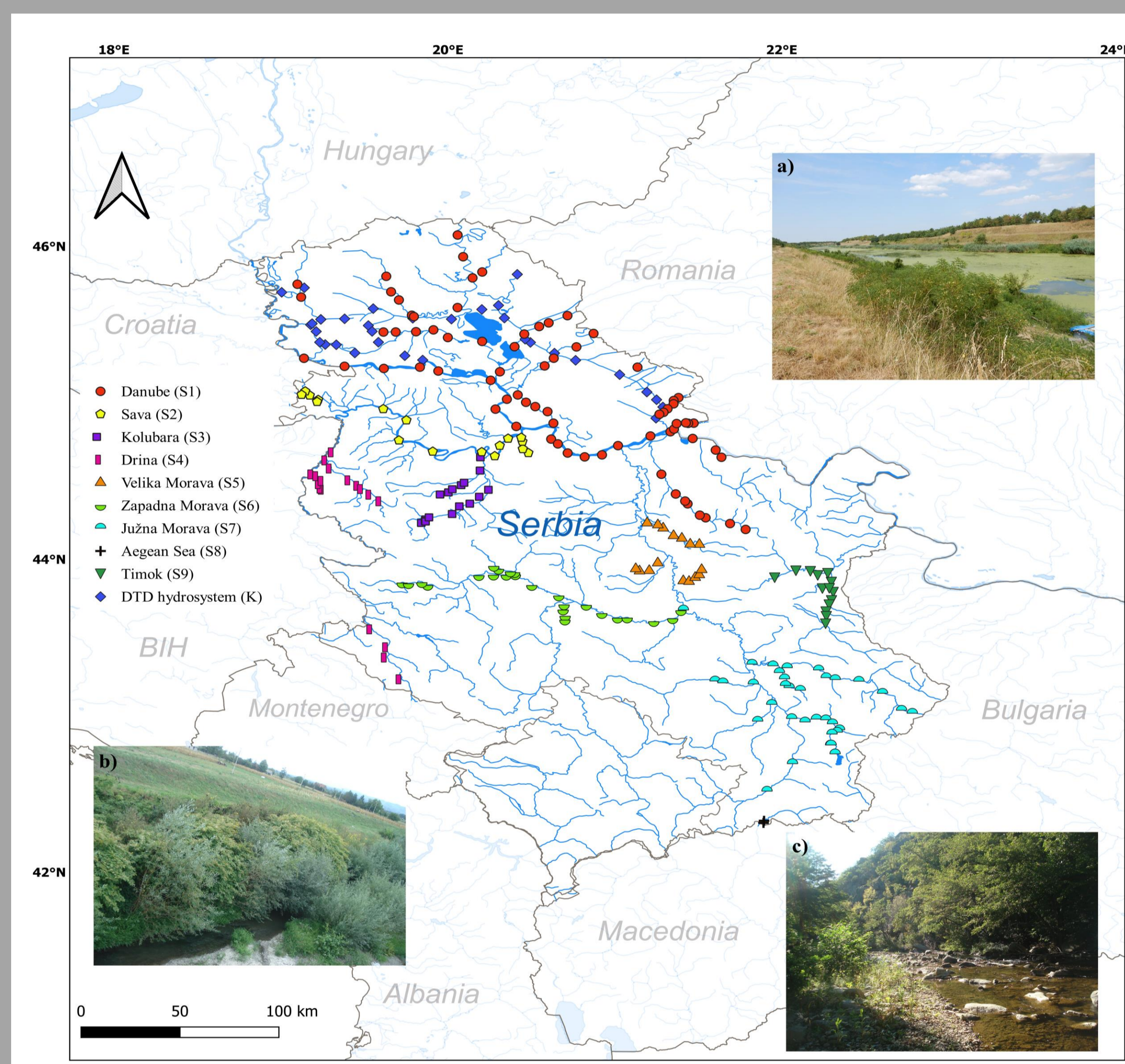
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## INTRODUCTION

Riparian areas are prone to biological invasions, due to various disturbances and anthropogenic pressures they frequently experience. In addition to numerous ecosystem services riparian vegetation provides, dominant vegetation types are also of critical importance for the invasion process, affecting the invasibility level and dominance of certain groups of invasive alien plants (IAPs). Consequently, the aims of this study were to test the effects of dominant riparian vegetation on the presence and abundance of invasive alien plants. Also, the idea was to observe the abundance of IAPs depending on their origin in relation to the dominant riparian vegetation.



## METHODS

Field research was conducted over a four-year period at a total of 250 riparian field sites, distributed along 39 rivers and 6 canal sections in Serbia. Dominant riparian vegetation (broadleaf/coniferous trees, poplar plantation, shrubs, herbaceous vegetation, bare land) on each field site was recorded photographically and later verified using Google Earth imagery. Effects of the riparian vegetation were tested against the total number of analyzed IAPs per site and their total cover using one-way ANOVA. Meanwhile, redundancy analysis (RDA) was conducted to show the relation between the observed IAPs grouped according to origin and the dominant riparian vegetation on the field site.

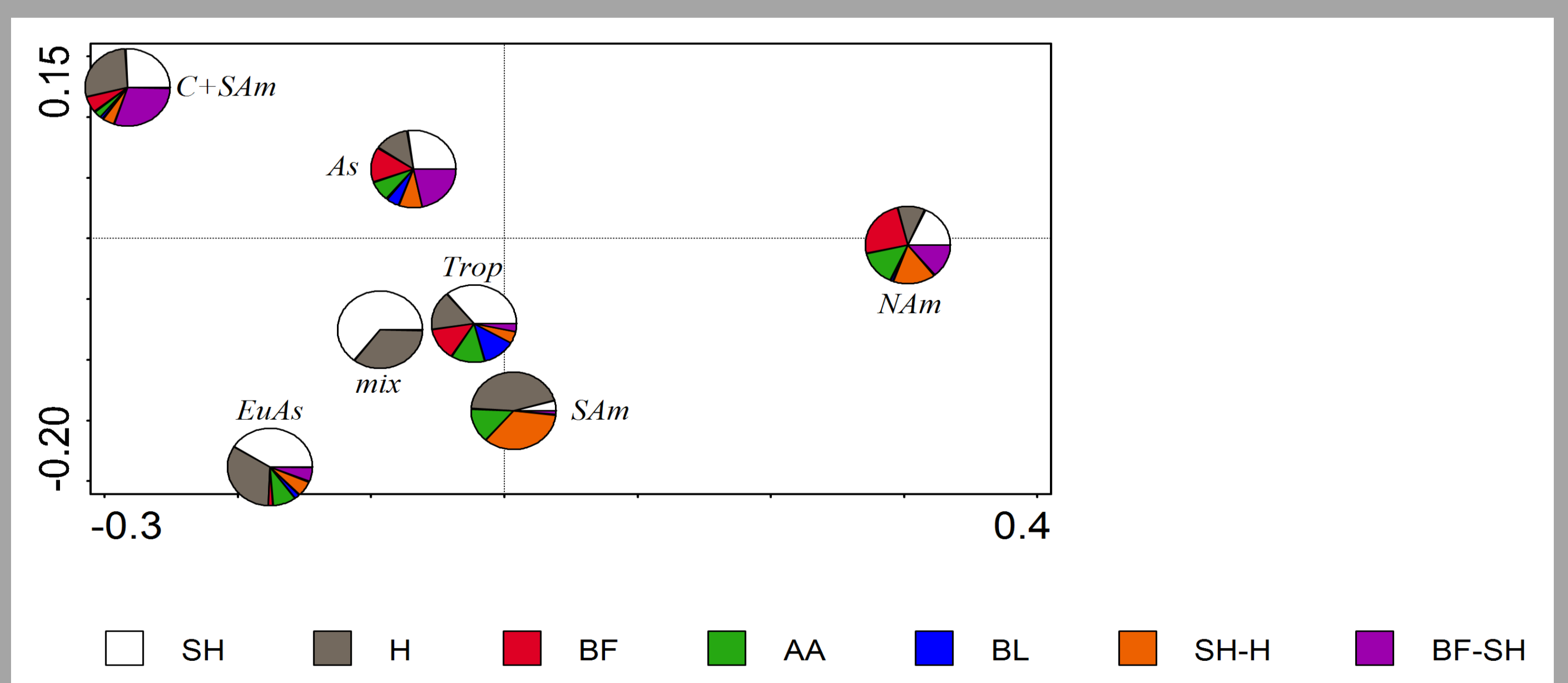
## RESULTS

Results of one-way ANOVA have shown that while dominant riparian vegetation does not affect the total number of IAPs per site significantly ( $p < 0.05$ ), it has a very significant effect ( $p < 0.01$ ) on their total cover on site.

RDA ( $F=2.2$ ,  $p < 0.001$ ) has shown that certain groups of analyzed IAPs, depending on their origin, favor specific combination of dominant riparian vegetation on site. While Eurasian, species of mixed African and Asian, Tropical, and Asian origin are mostly related to field sites with predominantly shrub vegetation, North American species are more abundant on broadleaf forest field sites.

Dominant vegetation type	mean (%)
bare land	14.00 <sup>a</sup>
mix of broadleaf forest and shrub vegetation	28.79 <sup>a</sup>
tree plantations	38.98 <sup>ab</sup>
broadleaf forest	42.89 <sup>ab</sup>
mix of shrub and herbaceous vegetation	45.49 <sup>ab</sup>
herbaceous vegetation	45.86 <sup>ab</sup>
shrubs vegetation	49.40 <sup>b</sup>

**Table 1.** Pairwise comparisons of mean total cover values of tested invasive alien plants, depending on the dominant vegetation type (DVT) on site. Numbers followed by the same letters represent values that are not significantly different according to Tukey's HSD test ( $p < 0.05$ ).



**Figure 1.** Pie chart diagram showing the association of selected invasive alien plants grouped by origin (C+SAm – Central and South America; As – Asia; Trop – Tropical; mix – Africa and Asia; SAm – South America; EuAs – Eurasian; NAm – North American) with dominant vegetation on site (SH – shrub vegetation; H – herbaceous; BF – broadleaf forest; AA – tree plantations; BL – bare land; SH-H – mix of shrub and herbaceous; BF-SH – mix of broadleaf forest and shrub).

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