

Differences in temporal niche among exotic and native tree species co-occurring in riparian forest of the Iberian Peninsula

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INTRODUCTION

Phenological differences between native and exotic plant species may help to explain invasive species success, especially if they exploit different temporal niches (Celesti-Grapow et al., 2003; Godoy et al., 2009).

Besides, a longer fructifying and seed dispersal period may favour the spread of invasive species in invaded areas (Traveset et al., 2008).

AIM

We aimed to compare differences in phenology among three exotic and one dominant native tree species co-occurring in riparian forests of inner Iberian Peninsula.

MATERIALS AND METHODS

Species:

NATIVE



Populus alba



EXOTICS



Ulmus pumila



Robinia pseudoacacia



Ailanthus altissima

Study site: Riverside of the Henares River (Madrid, central Spain).

Data collection:

- February 2011: We selected 6-13 adult trees per species.
- February 2011-February 2012: We monitored the frequency of each phenophase occurrence (leaf formation and abscission, flowering, fruit set and seed dispersal).

Statistics: Dates of beginning and end and duration of each phenophase were compared among species with one way ANOVAs.

RESULTS

We found differences among species in the dates of beginning and end and in the duration of all the studied phenophases, except in the date of leaf-formation (Fig. 1).

The phenology of the exotic *Ulmus pumila* was closer to that of the native *Populus alba*, showing earlier flowering and fructifying, longer leaf life-span and shorter seed dispersal than the rest of the studied exotics (Fig. 1).

Fruit set of the exotics *Ailanthus altissima* and *Robinia pseudoacacia* was at least four times longer than that of *Ulmus pumila* and *Populus alba*. Furthermore, seed dispersal of *Ailanthus altissima* and *Robinia pseudoacacia* was observed through the whole year (Fig. 1).

CONCLUSIONS

The exotics *Ailanthus altissima* and *Robinia pseudoacacia* exploit a different temporal niche than the dominant native *Populus alba* for their reproductive phenophases. This fact may help to avoid competition for resources among both groups of species.

In contrast, the exotic *Ulmus pumila* and the native *Populus alba* show a similar phenology, which makes them more direct competitors.

The longer dispersal period of *Ailanthus altissima* and *Robinia pseudoacacia* may increase the chances for spreading in the invaded ecosystems.

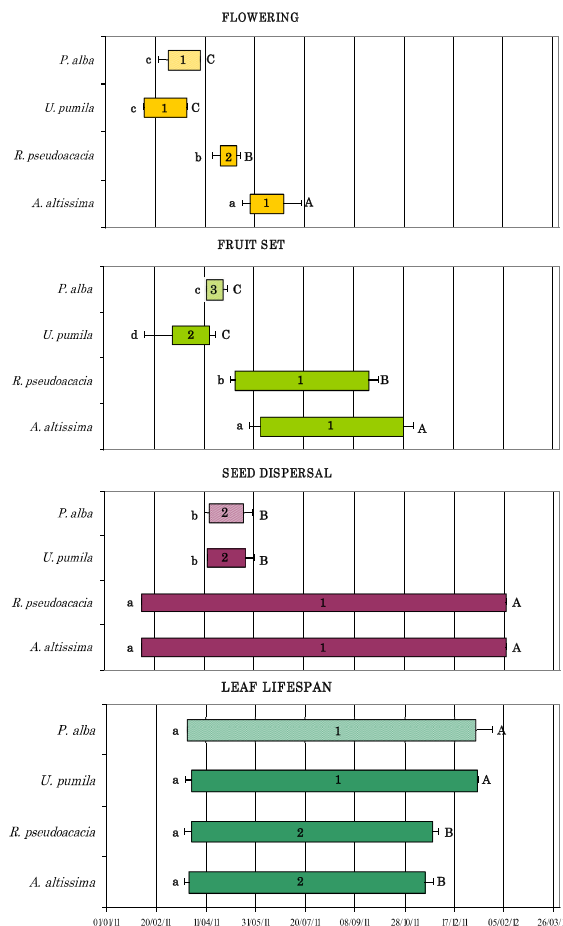


Fig. 1.- Phenological calendar of exotic and native tree species. Bars indicate the period when the phenophase was observed \pm SE. Different lower-case, capitals letters and numbers among species indicate significant differences of beginning, end and duration of phenophases, respectively. Exotic trees are *Ailanthus altissima*, *Robinia pseudoacacia* and *Ulmus pumila* and native tree is *Populus alba*.

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