INVASIVE WOODY LEGUMES: CLIMATIC RANGE DIFFERENCES AND FUNCTIONAL TRAITS

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INTRODUCTION

Invasive plants represent an important **threat for biodiversity conservation**. The Invasion is determined by the interaction between the environmental conditions of the areas of introduction and the characteristics of the species that determine their response to those environmental conditions, facilitating their establishment and invasion.

MATERIAL AND METHODS

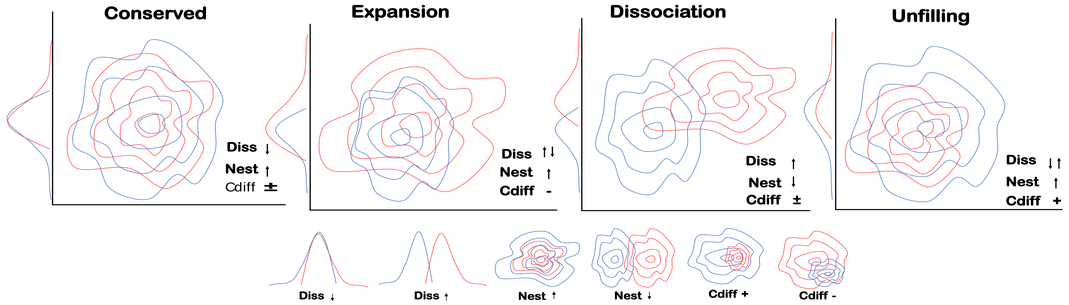
We evaluated the **patterns of occupation of the climatic space** based in the **native** and **introduced** distribution ranges and the differences of six key functional traits

We used **trait probability density** function to estimate species **probabilistic niches**. We then classified species into four groups according to the **climatic differences between the distribution ranges**

The comparisons between the **climate shift** groups and the distribution ranges were evaluated with **mixed linear models**. Additionally, we compared the **functional traits between species groups** using ANOVA

4 groups

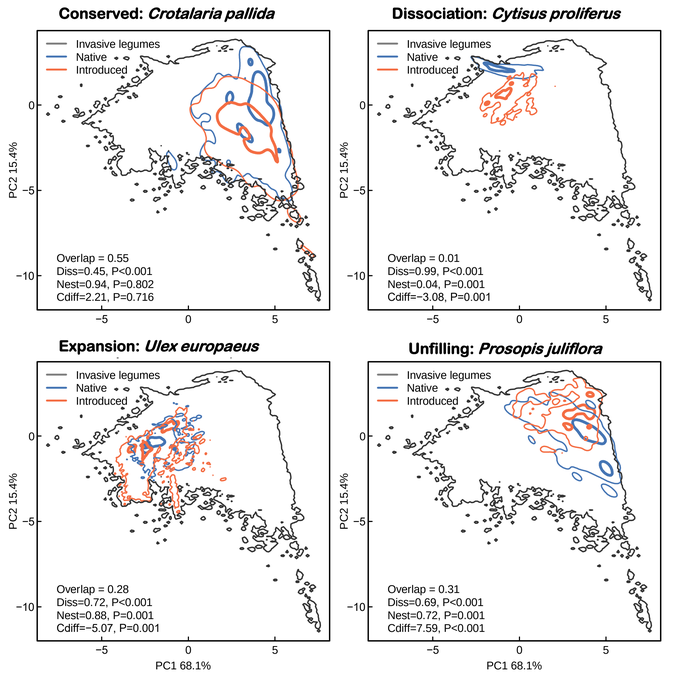
107 species

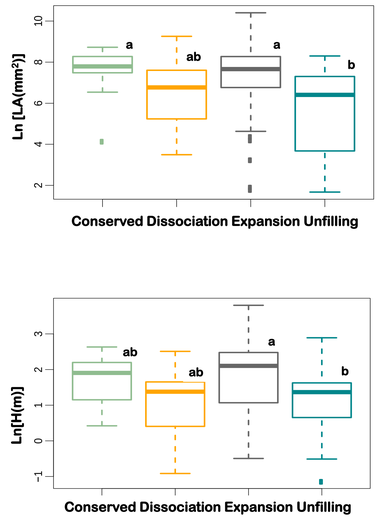


RESULTS AND DISCUSSION

In general, native and introduced climate niches of the invasive woody legume species were **highly dissimilar**. Our results showed a very limited overlap between native and introduced distribution range for **20** species, low overlap for **44** species, moderate overlap for **37** species, high overlap for only **6** species and no species showed very high overlap. **103** species (out of 107) presented significant differences between native and introduced space (pval dissim < 0.001). However, **all species had at least some part of their introduced climatic space nested within their native range space**

The only functional traits with significant **differences between groups** of invasive species were **leaf area** (LA) and **plant height** (H). The **Conserved** group presented the **largest foliar area**, which is consistent with its trend to occupy areas with **high precipitation and temperatures**. The **Expanded** group presented **high LA** and **greater height** and it is **not distributed in extreme weather condition**. The **Unfilling** group presented **lower LA** and **height**, which are common traits for species that are distributed in **extreme climate** conditions like high temperatures. We found similar traits for species in the **dissociation** group, also associated with **restrictive climatic** conditions such as lower minimum temperatures





MAIN CONCLUSIONS

The studied species seem to show **climate conservatism**, as we did not find sufficient evidence that all invasive woody legumes species are distribution in new climatic conditions in the introduced area; instead, they **are invasive in climatic conditions that are rare in their native distribution**

Four different behaviors between distribution ranges are possible; however, **the expansion of the climatic niche in introduced areas is by far the most common among woody legumes**. These different behaviors may be the result of the time elapsed since introduction and of adaptation to a new environment

The functional traits of the species groups are consistent with the expected patterns for their climatic distribution. In some species, climatic variables in the native distribution seem to be restricted to their distribution in the introduced range.

lyrCIS - 2021