



Invasive potential of alien plant species explained by mechanistic traits: a step forward in understanding alien invasion mechanisms

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Invasive alien species are a serious threat to biodiversity. Several studies and meta-analyses have been focused on the comparison between invasive (IAS) and native species but, to date, a unique set of traits responsible for the invasive potential of alien species at a global scale has not been clearly identified. Most previous studies analysed few species and traits simple to measure or were based on reviews or meta-analyses. In this study, we present a comparison on several woody and herbaceous IAS (15 species) and native species (78), based on functional and mechanistic traits measured in areas along a water availability gradient. We tested whether i) IAS generally share an acquisitive strategy independent of growth form or habitat features; ii) mechanistic traits related to drought tolerance and leaf venation were higher in IAS than in native species; iii) mechanistic and functional traits are coordinated in trade-offs. Our results show that IAS are characterised by traits that favour fast-growth, independently of growth form or habitats features. IAS consistently shared lower drought resistance and denser venation network, which are mechanistic traits directly influencing leaf construction costs and photosynthetic and growth rates. The coordination between construction costs, drought resistance and photosynthesis-related traits, suggested that IAS outperform native species due to higher potential for carbon gain and biomass accumulation, while sharing similar water-use efficiency.