DIRECT RESPONSES TO TEMPERATURE INCREASE IN ALIEN VS. NATIVE CONGENERIC PLANT SPECIES

Maya Verlinden, Ivan Nijs

Research Group of Plant and Vegetation Ecology, University of Antwerp, CDE, Wilrijk

INTRODUCTION

Interaction between 2 Global Changes: **Climate warming** & **Plant Invasions**

Reasons to believe that alien species will react differently to climate warming than natives:

- They often exhibit a greater plasticity in response to changes and disturbances in their environment.
- They often originate from regions with a warmer climate.

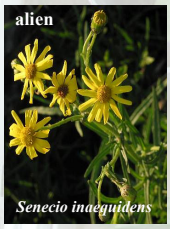
➡ These characteristics may enhance their competitiveness relative to natives.

IPCC working group II, Climate Change 2007: Impacts, Adaptation and Vulnerability

« For increases in global average temperature exceeding 1.5-2.5°C and in concomitant atmospheric carbon dioxide concentrations, there are projected to be major changes in ecosystem structure and function, species' ecological interactions, and species' geographic ranges, with predominantly negative consequences for biodiversity. »

EXPERIMENTAL SET-UP

PLANT SPECIES

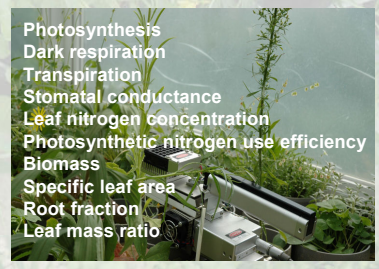


10 congeneric species pairs (native + alien)

EXPERIMENTAL CONDITIONS

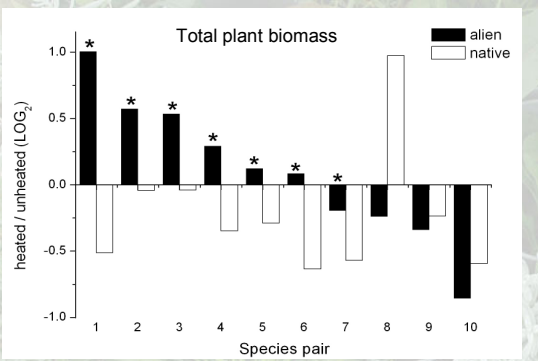
- 6 climatized chambers (T_{air} or T_{air} + 3 °C)
- Containers with single plants
- Optimal water and nutrient supply

MEASUREMENTS



Ecophysiological & morphological characteristics related to growth and productivity

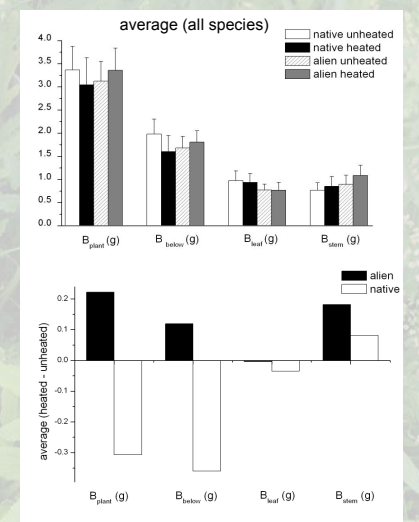
PRELIMINARY RESULTS



Species pair (alien – native):

1. *Lathyrus latifolius – Lathyrus pratensis*
2. *Cerastium tomentosum – Cerastium arvense*
3. *Artemisia verlotiorum – Artemisia vulgaris*
4. *Solidago gigantea – Solidago virgo-aurea*
5. *Impatiens glandulifera – Impatiens noli-tangere*
6. *Senecio inaquidens – Senecio jacobaea*
7. *Bidens frondosa – Bidens tripartita*
8. *Rumex scutatus – Rumex acetosa*
9. *Barbarea stricta – Barbarea vulgaris*
10. *Cardaria draba – Lepidium campestre*

* Warming favours the alien species of the congeneric pair



CONCLUSIONS

• Our results suggest that alien and native plant species respond differently to climate warming, with the majority of the alien species benefiting from a warmer climate, whereas native species are adversely affected.

• Warming will probably alter native-alien interactions, but more research is necessary to estimate the future evolution of invader impact in a warmer climate.

contact: maya.verlinden@ua.ac.be