Comparison of the life strategy of two invasive species (*Centaurea maculosa* Lam. & *Senecio inaequidens* DC.)

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Introduction

The ability of a species to invade, *i.e* its invasiveness, is the consequence of ecological and evolutionary processes.

- Enemy release hypothesis
- Novel weapon hypothesis
- Propagule pressure

} ***Ecological processes***

- Evolutionary increase of competitive ability
- Evolution reduced competitive ability
- Hybridization to increase genetic variations

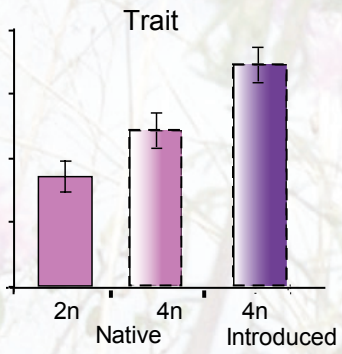
} ***Evolutionary processes***

➢ We studied growth and some functional traits of two worldwide invasive species (Asteraceae), *Centaurea maculosa* Lam. and *Senecio inaequidens* DC., to compare their strategies regarding evolutionary and ecological processes.

Hypotheses

• According to evolutionary processes, polyploid genotypes (4n) perform better than diploid ones (2n)

• Following ecological processes, genotypes from introduced range (Int.) perform better than those from native one (Nat.)



Experimental design

2 species:
- *C. maculosa* (native from Europe, invasive in North-America)
- *S. inaequidens* (native from South-Africa, invasive in Europe)

3 pools :
- Native diploid (Nat 2n)
- Native tetraploid (Nat 4n)
- Introduced tetraploid (Int 4n)

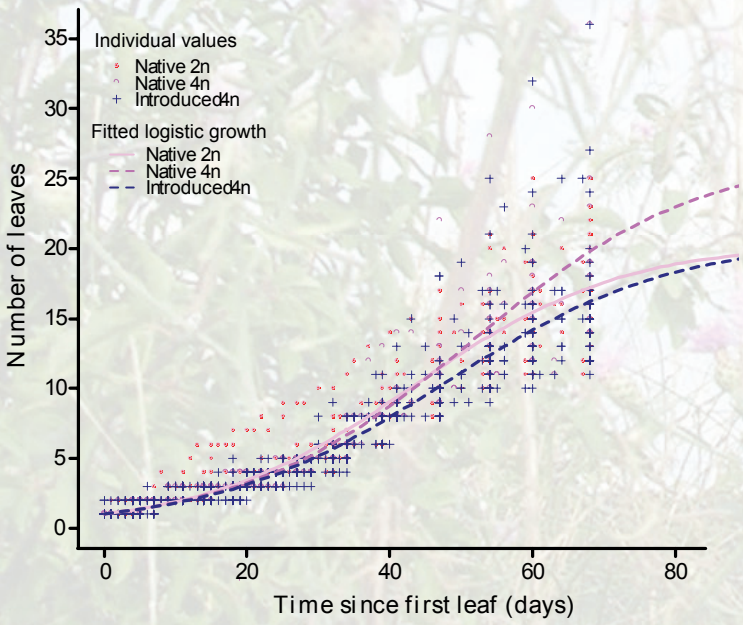
Replicates	Nat. 2n	Nat. 4n	Int. 4n
C. maculosa	72	18	90
S. inaequidens	45	45	90

Growing conditions:
- Individual growth, pots in greenhouse (controlled conditions), water supply

Comparison of the species

Growth

Centaurea maculosa



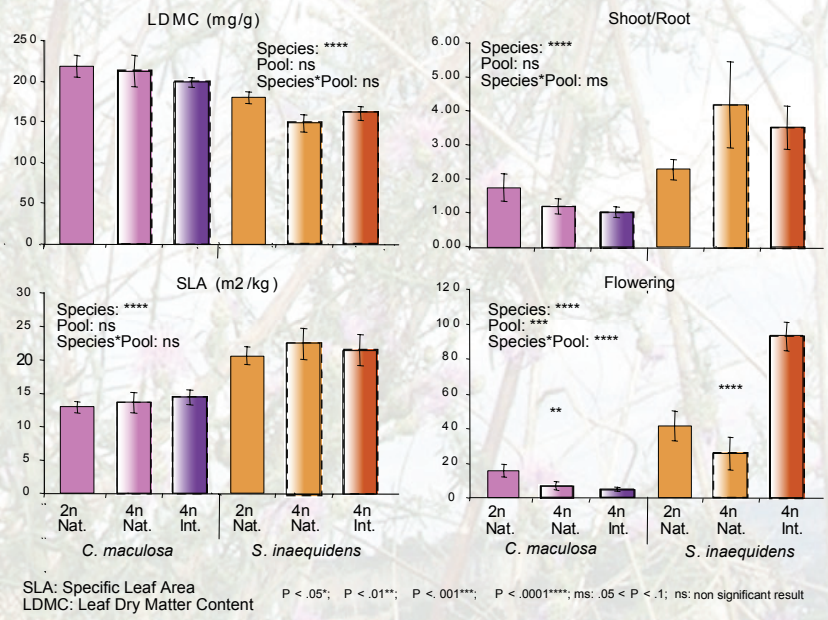
Centaurea maculosa

Slow vegetative growth, low Specific Leaf Area (SLA) and high Leaf Dry Matter Content (LDMC) leading to unpalatable leaves.
Resources preferentially allocated to roots

Senecio inaequidens

Fast vegetative growth (not shown), low LDMC and high SLA.
Resources allocated to shoots and reproductive effort (high flowering)

Traits



SLA: Specific Leaf Area
LDMC: Leaf Dry Matter Content

P < .05*; P < .01**; P <. 001***; P < .0001****; ms: .05 < P < .1; ns: non significant result

Comparison of some functional traits of diploid (2n) and tetraploid (4n) genotypes of native (Nat.) and non-native(Int.) seeds of *Centaurea maculosa* and *Senecio inaequidens*

2 invasive species, 2 invasion strategies *(Comparison of the pools)*

Centaurea maculosa

- Increase in root allocation supports the theory of novel weapon hypothesis (Evolutionary process)
- Decrease in leaves palatability might be the consequence of the release from herbivores (Ecological process)

Senecio inaequidens

- Fast vegetative growth and resource allocation to shoots seems to support the theory of an increase in competitive ability (Evolutionary process)
- High and early flowering leads to an important propagule pressure involved in invasion process(Ecological process)

➢ It seems that ecological **and** evolutionary processes are involved in species invasions. Nevertheless, except for flowering, we neither show significant differences between diploid and tetraploids genotypes, nor between native and introduced ones.

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