

---

# Inbreeding depression and selective history in *Noccaea caerulescens*

Mathilde Mousset\*<sup>1</sup>

<sup>1</sup>Institut des Sciences de l'Evolution - Montpellier (ISEM) – CNRS : UMR5554, Institut de recherche pour le développement [IRD] : UMR226, Université Montpellier II - Sciences et techniques – Place E. Bataillon CC 064 34095 Montpellier Cedex 05, France

## Abstract

Although inbreeding depression is a key driver of mating system evolution, we do not understand how it interacts with adaptation. It varies among species and populations, and can increase or decrease under stressful conditions. Few studies have attempted to disentangle the effects of stressful environmental conditions from those of selective history and adaptation to these conditions on the variation in inbreeding depression magnitude. We disentangle the effect of selective history and stress on inbreeding depression using the heavy-metal tolerant herb *Noccaea caerulescens* in a common garden experiment. This self-compatible species harbours ecotypes with different adaptation history to soil pollution: the more inbred non-metallicolous ecotype grows on regular soils whereas the less inbred metallicolous ecotype thrives on contaminated mine wastes.

We grew outbred and inbred individuals deriving from nine populations of both ecotypes in controlled conditions, on toxic and non-toxic soils. Inbreeding depression was measured on vegetative and reproductive traits along the life cycle.

Inbreeding depression is low in this species, variable among traits, but soil toxicity rarely affects it. Metallicolous plants suffer from greater inbreeding depression than non-metallicolous plants for several traits. We detect no interaction between the history of adaptation and the current environment on the expression of inbreeding depression.

These results do not settle the discrepancy between different theoretical predictions, but they raise questions about the effect of self-fertilization on purging of deleterious mutations in heterogeneous environments.

**Keywords:** Inbreeding depression, heavy, metal tolerance, stress, mating system, local adaptation

---

\*Speaker