Rethinking the role of intraspecific variability in species coexistence

Camille Girard-Tercieux[1], Isabelle Maréchaux[1], Adam Clark[2], James Clark[3], Benoit Courbaud[4], Claire Fortunel[1], Joannes Guillemot[5], Georges Kunstler[4], Guerric Le Maire[5], Raphael Pelissier[1], Nadja Rüger[6], and Ghislain Vieilledent[1]

[1]AMAP
[2]University of Graz
[3]Nicholas School
[4]LESSEM
[5]Eco&Sols
[6]German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig

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Abstract

Intraspecific variability (IV) has been proposed as a new track to explain species coexistence. Previous studies generally assumed that IV results from intrinsic differences between conspecifics that widen species' fundamental niches and blur differences among species, thus impeding stable coexistence, but also slowing down the rate of competitive exclusion. Based on a body of evidence, we here argue that IV does not necessarily imply differences among conspecifics, nor species niches overlap: conspecifics differ in their measured attributes mainly due to differences in the micro-environment they thrive in. Consequently, they respond more similarly to environmental variation than heterospecifics, thereby concentrating competition within species – a necessary condition for species coexistence. We call for new studies exploring observed IV as an outcome of species-specific responses to high-dimensional environmental variations that can lead to inversions of species hierarchy in space and time promoting stable coexistence.

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