39th New Phytologist Symposium

Trait covariation: Structural and functional relationships in plant ecology

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Programme, abstracts and participants
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Invasive species differ in key functional traits from native and non-invasive alien plant species on Marion Island

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Invasive species are a major conservation threat. A need exists to fully understand which factors have allowed invasive species to become successful to inform invasion risk and reduce future invasions. We used a functional trait-based approach to ascertain whether specific traits make invasive species successful to the Sub-Antarctic region. We compared the functional traits of invasive plant species to those of indigenous and non-invasive alien plant species on Sub-Antarctic Marion Island. Invasive species were characterized by traits that indicate enhanced resource acquisition and competitive vigour compared to indigenous and non-invasive alien species. This may explain what drives the success of invasive plant species on Marion Island. Compared to invasive species, indigenous species invested in physically tougher leaves and more resilience against freezing. These defence traits are expected become less important for continuing fitness as conditions become milder on Marion Island due to climate change, placing the native flora at a disadvantage to the alien flora. Our functional approach indicates that plant traits can be used to predict invasion potential, and suggests that invasive species on Marion Island will become more successful under a climate change scenario.

Plant traits as floodplain management aid?

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Floodplains of regulated rivers often fulfil several functions, like providing water safety during high river discharges and as nature areas. Understanding how vegetation development is steered, may aid in optimizing different floodplain functions. Because traits are believed to couple processes to traits and vice versa, the trait concept may proof eventually useful for river management issues. However, is this indeed the case? The objective of this study is therefore to determine if easy measurable traits do reveal the steering mechanisms in observed vegetation patterns in floodplains of regulated rivers.

In each of three Dutch floodplains, ten 1 m² plots were marked and soil moisture and composition was measured. The vegetation was mapped and for species covering more than 15% of a plot, leaf traits (mass, area, C, N and P) were determined. The Turboveg software supplied the categorical traits of all the mapped plant species. All plots were dominated (coverage >15%) by hemicryptophytes, but their measured leaf traits depended on the moistness and nutrient status of a plot. Known relations between leaf traits and photosynthetic capacity linked drier and less nutrient rich plots to lower photosynthetic capacity and therefore reduced biomass production per time. However, how this and other traits may relate to floodplain roughness and biodiversity is still being analysed.