Integrating reproductive phenology in the description of plant phenotype

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Abstract

In the last 30 years, there has been a renewed interest in a detailed description of the phenotype using a trait based approach, with an aim of improving our understanding and prediction of plant, community and ecosystem functioning. Despite its recognized importance for plant survival and reproduction, phenology has been largely understudied in trait based approaches to describe plant functioning. How reproductive events relate to other plant functional dimensions and integrate into the whole phenotype therefore remains to be established.

The aim of this study is to explore how events of reproductive phenology combine in the phenotypic space derived from several traits commonly used in comparative ecology. Relationships between phenological traits and traits contributing to the Leaf-Height-Seed scheme proposed by Westoby (1998: *Plant and Soil*, 199: 213-227) are tested using data collected for 117 species growing in the Mediterranean region of southern France and belonging to three growth forms (annuals, herbaceous perennials and woody perennials of low stature).

Phenological traits were related both to plant height and seed size in annuals. They were related only to plant height in herbaceous perennials, while no correlation was found for woody species. Whether reproductive phenology can be considered as an independent axis of functional variation in plants therefore seems to depend on the species group considered. This study confirms the value of using phenological traits as a functional dimension in comparative approaches. It brings new insights into the links between phenology and other dimensions of plant functioning, putting back phenology into the broader context of plant ecological strategies.

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