Characterizing the reproductive strategies of flowering plants

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Résumé

Reproductive and floral traits are strikingly diverse in flowering plants. However, how these traits are associated and how they shape species diversity is still poorly known. Here, we explore the strategies flowering plants have evolved to achieve pollination and reproduction using 21 floral and life-history traits from an original and representative set of 360 species sampled in 170 families across the angiosperm phylogeny.

Our results confirm that outcrossing rates per se are strongly associated with a trait axis involving plant size and growth form, but they also identify pollination-related traits such as flower sex and floral reward as an equally important axis of variation. This pollination axis clearly sets unisexuality (monoecy and dioecy) apart as a separate outcrossing strategy that likely results from more ecological selective pressures than the avoidance of selfing and inbreeding alone. Species are not evenly distributed across trait space and we identified three major reproductive strategies corresponding to combinations of traits that repeatedly evolved together, and further fine-scale structure within these strategies.

We argue that pollination-related traits, which have largely been overlooked in studies of plant functional ecology, represent an important dimension of plant trait variation that exposes unexpected associations, generating new insights into the ecology and evolution of plant mating and sexual systems.

Mots-Clés: Flowering plants, reproduction, functional ecology, pollination

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