
Fruit set in European orchids: a bridge between evolutionary ecology and conservation

Iris Le Roncé^{*†1}, Bertrand Schatz^{*‡1}, Nina Joffard¹, Hélène Vogt-Schilb^{1,2}, Jacques Kleynen[§], and Jean Claessens

¹Centre d'Ecologie Fonctionnelle et Evolutive (CEFE) UMR 5175, CNRS – Université de Montpellier – Université Paul Valéry – EPHE – CNRS : UMR5175 – 1919 Route de Mende, 34293 Montpellier cedex 5, France

²Faculty of Science, University of South Bohemia – Ceske Budejovice, Czech Republic

Abstract

Despite an increasing interest in plant–pollinator interactions, quantitative data on their efficiency remains poorly documented. Plant fruit set reflects the efficiency of pollination strategies and is thus frequently used in evolutionary ecology as a proxy of plant fitness. Fruit set is also an important demographic parameter, as it conditions the persistence of plant populations in their habitats, linked to their conservation. Orchids are very convenient family to study plant pollination, since the relative easiness to quantify the number of fruit and the diversity of their strategies for pollinator attraction. Previous reviews already focused on factors determining the reproduction success of orchids, but they either focus only on a few dozens of European species or test the effect of only a few parameters on orchid fruit set. Here we build an original database of observations on 170 Euro-Mediterranean species to identify factors affecting orchid fruit set along large spatial and temporal gradients. This database is composed of more than 1700 observations of fruit set in natural populations, coming from grey and published literature, and from observations made by orchid specialists across Europe. Production of nectar, number and size of flowers, and opening up of the environment are the factors influencing the value of fruit set. Despite variation by seed set and efficiency of germination, such information on fruit set allows comparative analysis on functional ecology and provide relevant information for population dynamics and conservation.

Keywords: Conservation, evolutionary ecology, Orchidaceae, fruit set

*Speaker

†Corresponding author: iris.le_ponce@ens-lyon.fr

‡Corresponding author: bertrand.schatz@cefe.cnrs.fr

§Corresponding author: jac.kleynen@ziggo.nl