

The pollination syndromes: how much do we really understand?

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Ecologists and evolutionary biologists seek to document repeated patterns that they see in nature and to understand the processes that determine these patterns. One example is the idea of “pollination syndromes”, sets of flower characteristics that appear to have repeatedly evolved in different plant families due to the convergent selection applied by specific types of pollinators. Thus, red, scentless flowers are typical of many bird-pollinated plants whilst white, night-scented flowers often signify moth pollination. Plant species that display such archetypical flower traits are used as textbook examples to emphasize a view that plant-pollinator interactions tend to be predictable and specialised.

Until recently the pollination syndromes have rarely been examined for their accuracy and predictive value. Long repetition may have convinced many workers that their utility is confirmed. However, critical tests of scientific hypotheses always are valuable. Recently the journal *Ecology Letters* published such a test by Rosas-Guerrero et al. (2014), in the form of a review of the available literature and a statistical method called meta-analysis. This paper concluded that the pollination syndromes have excellent predictive power.



We perceive a number of structural problems with the test, and have attempted to comment on them in a constructive way (Ollerton et al. 2015). First, searching the literature must be done with great caution so as not to bias the types of studies that are found. Second, data from the studies must be extracted and analysed carefully, with appreciation for missing or incomplete information. Third, the results must be presented dispassionately, with an eye to misleading or over-interpreted conclusions. When these cautions are applied to the Rosas-Guerrero et al. study we conclude that the traditional pollination syndromes have less predictive power than these authors surmised, which is more in line with a previous test done in a very different way by Ollerton et al. (2009).

Despite providing a framework for understanding pollination biology for over 150 years, the pollination syndromes continue to surprise us and to provide a vital antidote to scientific hubris: we do not understand nearly as much about them as we assume.

References

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