

Pollen to ovule ratios: standard or variation — a compilation

By

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With 2 tables

Abstract

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To analyse reproductive systems, usually the P/O ratio (Cruden 1977) is calculated, i.e., the ratio of the amount of pollen to the number of ovules in the flower. From this quantitative measurement conclusions can often be drawn about the proportion of selfing or out-crossing. The P/O ratio is a conservative indicator of breeding systems and reflects the likelihood of sufficient pollen grains reaching each stigma: the more efficient the transfer of pollen, the lower the P/O ratio (Cruden 1977). The P/O ratios sensu Cruden have been confirmed many times, but nevertheless sometimes considerable deviations have been found: In species in which aggregated pollen is transferred, such as in Mimosaceae, Asclepiadaceae, and Orchidaceae, the P/O ratio is extremely low, whereas, e.g., in species of Boraginaceae the P/O ratio is high compared to other xenogamous species. This paper compiles the P/O ratios of about 1400 species (140 families) taken from about 180 papers. Some interesting cases of deviating P/O ratios and factors influencing the P/O ratio are discussed.

Keywords: P/O ratio, compilation of 1400 species, breeding systems, factors influencing P/O ratios.

Introduction

From the viewpoint of pollination, Pohl (1937) considered it more useful to relate the pollen production of a flower to the fertile ovules than to count only the pollen production. He found that the ratio of pollen grains to ovules could be of similar magnitude among wind- and animal-pollinated species: Although some wind-pollinated trees have the highest pollen to ovule (P/O) ratios, there are other wind-pollinated species with ratios equal or even lower than those of animal-pollinated species. Later studies further found positive associations between