

Background: The relative frequency of wind- and animal-pollinated plants is non-randomly distributed across the globe and numerous hypotheses have been raised for the greater occurrence of wind pollination in some habitats and towards higher latitudes. To date, however, there has been no comprehensive global investigation of these hypotheses.

Aims: Investigating a range of hypotheses for the role of biotic and abiotic factors as determinants of the global variation in animal vs. wind pollination.

Methods: We analysed 67 plant communities ranging from 70° north to 34° south. For these we determined habitat type, species richness, insularity, topographic heterogeneity, current climate and late-quaternary climate change. The predictive effects of these factors on the proportion of wind- and animal-pollinated plants were tested using correlations, ordinary least squares (OLS) and logistic regression analyses with information-theoretic model selection.

Results: The proportion of animal-pollinated plant species was positively associated with plant species richness and current temperature. Furthermore, in forest, animal pollination was positively related to precipitation. Historical climate was only weakly and idiosyncratically correlated with animal pollination.

Conclusion: Results were consistent with the hypothesised reduced chance for wind-transported pollen reaching conspecific flowers in species-rich communities, fewer constraints on nectar production in warm and wet habitats, and reduced relative effectiveness of wind dispersal in humid areas. There was little evidence of a legacy of historical climate change affecting these patterns.