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POLLINATION ECOTYPES: THE KEY ROLES OF FLOWER COLOUR, MORPHOLOGY AND SCENT CHEMISTRY IN POLLINATOR SHIFTS WITHIN THREE SOUTH AFRICAN PLANT SPECIES

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ABSTRACT

Pollination ecotypes, in which among-population differences in floral traits of species are associated with differences in pollination system, are ideal to study initial stages of floral divergence, enabling identification of floral traits under selection and of pollinator characteristics that drive divergence. I use three examples of pollination ecotypes in species from the South African flora, including two important horticultural species, to illustrate this.

Firstly, in distinct colour forms of the River Lily *Hesperantha coccinea* (Iridaceae), red and pink flowers of butterfly- and long-tongued fly ecotypes also differ in flower orientation and tube length, reflecting the demonstrated importance of colour for attraction of these pollinators and suggesting differences in feeding mechanics and behaviour that affect the mechanics of pollination.

Secondly, in two subspecies of the rare *Nerine bowdenii* (Amaryllidaceae), flowers are similar in colour and structure, but differences in flower size precisely mirror differences in dimensions of the respective long-proboscid fly pollinator species, emphasizing the importance of morphological matching between flowers and pollinators in pollinator-mediated adaptive divergence.

Finally, in pollination chemotypes of *Guthriea capensis* (Achariaceae), flowers are similar in morphology and appearance, but are characterized by highly distinctive scent chemistry, indicative of the importance of odour for attraction of lizard and rodent pollinators.

Together these studies illustrate the roles of pollinator sensory ecology, behaviour, and morphology in understanding the selective mechanisms underlying the evolution of variation in floral morphology and advertising traits among flowers.