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POLLINATOR-MEDIATED ADAPTIVE WANDERING IN A FLORALLY DIVERSE ANNUAL DAISY: *Dimorphotheca pluvialis-sinuata* (ASTERACEAE)

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ABSTRACT

Pollinator shifts, the divergent floral-phenotypic and ecological specialization of allopatric plant populations along spatial pollinator gradients, are the most frequently invoked drivers of floral divergence in the Cape. However, divergent floral adaptation may occur in the absence of fitness trade-offs between floral phenotypes, leading to phenotypically diverse but ecologically generalist flowers i.e. adaptive wandering. Focusing on three morphotypes of spring mass-flowering *Dimorphotheca pluvialis-sinuata* daisies, we quantified floral phenotypic divergence and trait integration, gradients of network and pollinator-use similarity and trait preferences of local pollinators to assess whether the pollinator-shift or adaptive wandering models explain floral diversification in the complex. Multivariate analyses of floral trait data suggest a strong correspondence with *a priori* morphotype designations, while comparison of field collections with specimens grown in a common garden suggest that floral traits are not sufficiently plastic to obscure the diagnosis of morphotypes. Quantitative network analyses revealed that visitor communities on *Dimorphotheca* were generally highly dissimilar, with weak visitor-species gradients inconsistently underlying the distribution of morphotypes. Contrary to expectations derived from pollinator-shifts, this suggests that pollinator distributional limits do not explain floral divergence and that these daisies are ecologically generalized. However, despite the apparent generalization of *Dimorphotheca,* indicator species analyses identified strong visitor affiliates with each of the three morphotypes. Experimental manipulation of ray colouration and disc appendage morphology with model inflorescences showed that these taxa preferred to visit models more closely resembling the native phenotype in each morphotype's distribution. However, overall trait preferences were weak, suggesting that floral divergence is unlikely to result in niche shifts that contribute to reproductive isolation. It therefore appears that patterns of divergence and pollinator use in *Dimorphotheca* are more closely aligned with the theoretical model of adaptive wandering than pollinator-shifts.