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POLLINATION BIOLOGY OF ENANTIOSTYLOUS *Cyanella alba*: WHERE ARE THE BUZZ-POLLINATING BEES?

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ABSTRACT

Flowers interact with pollinators and have evolved diverse forms to enhance outbreeding. One such innovation is enantiostyly ('mirror-image flowers') where styles are deflected either left (L), or right (R) of the flower's midline. This asymmetry is usually accompanied by heteranthy, specialization of anthers for feeding and pollinating function. Pollinating anthers are reciprocally positioned to the style promoting bee-mediated cross-pollination between flowers of opposite 'handedness' by 'buzz-pollinating' bees. *Cyanella* is a genus of nine species mostly endemic to the Western Cape; six are straight-styled and two possess enantiostyly. In *C. alba* three kinds of plants occur with either L or R flowers, or both (M). We investigated multiple populations of *C. alba* in the Biedouw valley and Bokkeveld plateau. Surveys of plant handedness revealed average frequencies of L=0.47, R=0.43, M=0.10 among 26 populations with an average daily display size of 1.58 flowers. Censuses of marked plants throughout the season revealed an increase in M frequency concomitant with decreases in L or R plants. Controlled crosses demonstrated moderate self-incompatibility, with plants incapable of autonomous self-pollination and comparisons of open- versus controlled cross-pollinations confirmed chronic pollen limitation of seed set in three populations. Despite 20+ hours of observation, we observed no buzz pollination in any population and only very limited generalist bee visitation in a few populations on the Bokkeveld Plateau. Observations of stamen dimorphism in this region suggest that heteranthy may be breaking down in some populations enabling generalist pollination, perhaps in response to the absence of bees capable of buzz pollination.