

HETEROCHRONY OF FLORAL AND MATING SYSTEM CHARACTERS BETWEEN
NICOTIANA LONGIFLORA AND *N. PLUMBAGINIFOLIA*

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ABSTRACT

The evolution of selfing is one the most fascinating and common trends observed in flowering plants. Selfing flowers are often smaller than their outcrossing relatives, with reduced reproductive effort. The selfing species *Nicotiana plumbaginifolia* (plum) follows this pattern with smaller flowers than its outcrossing sister species *N. longiflora* (long). This study focuses on a glasshouse grown population descended from a field collected population with three corolla length morphs: long, medium and plum. Morphological characters likely relating to mating system were measured, as well as glasshouse selfing rate. Anther Stigma Distance, a measure of herkogamy, varies between corolla morphs, with long > 0 , medium ≈ 0 and plum ASD negative. Corolla length and anther-stigma distance explained some of the selfing rate variation across the three morphs, but had limited correlation with selfing within morphs. Next, I studied the development of the floral organs in all three morphs. Relative Growth Rates (RGRs) were calculated for eight floral traits. RGR is decreased in plum for all floral organs, while RGRs were the same in long and medium for most organs. Length differences between long and medium result from a shorter period of growth. Medium and plum have different mechanisms resulting in shorter flowers. Medium flowers result from progenesis, while plum flowers are produced through neotony. There is also a decreased herkogamy at anther dehiscence in plum and medium which coincides with greater autogamy. Medium and plum anthers dehisce at the same time, earlier than long, and increase the likelihood of selfing.