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PHENOTYPIC SELECTION ON FLOWER SIZE: A GENDER-DEPENDENT PROCESS

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Floral size is a trait closely related to pollinator attraction, so larger flowers positively favor pollen transfer and subsequent reproductive output. However, selection on larger flowers can be highly limited by resource availability due to high floral maintenance costs. Resource- and pollinator-mediated selection on flower size is generally gender-dependent, with higher intensity of selection by pollinators through male fitness, whereas female fitness is more resource-limited. Therefore, selection analyses on flower size through both sexes under different environmental conditions are essential to identify reliable estimates of phenotypic selection. We examined phenotypic selection patterns on flower size through both sexes in two *Kielmeyera* (Clusiaceae) species from the Cerrado. Observational and experimental field studies in two species with contrasting flower size and flowering seasons (*K. coriacea* producing smaller flowers at the dry season and *K. regalis* producing larger flowers at the wet season) were conducted to analyze potential differences in floral water costs, pollen limitation, pollen removal and their effects on plant fitness. We found evidence of pollen limitation through female fitness in both species, especially in *K. regalis*. For male fitness, the percentage of pollen removal was 1.5-times higher in *K. coriacea*. Corolla transpiration rates in *K. coriacea* were four-times higher than in *K. regalis* due to environmental seasonality related to higher temperature and water deficit. Selection on flower size through male function was positive and significantly higher than selection through female components in both species. Stabilizing selection in *K. coriacea* and positive selection in *K. regalis* on flower size were detected through seed number. Our results suggest that flower size in *K. coriacea* is mainly a resource-limited trait, whereas in the large-flowered species *K. regalis* it is more limited by pollen. We demonstrate that differences in pollen and resource limitation determine the optimal flower size by altering gender-specific selection.

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