

An Investigation into the Floral Biology of King-coconut and Developing a Protocol for Artificial Hand Pollination

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King coconut (KC) is an intermediate-type coconut form in Sri Lanka and a popular natural beverage. Despite its importance, floral biology remains largely unresearched. The objective of the present study was to investigate the key floral phases of KC in IL1a and IL3 agro-ecological regions (AERs) of Sri Lanka and to develop a protocol for artificial hand pollination. Seven palms aged 18-20 years were randomly selected per AER. All inflorescences emerging between December 2023 and December 2024 were recorded, totaling 74 in IL1a and 66 in IL3. The duration of the key floral phases of each inflorescence were recorded. A general linear model was employed to compare the two locations. The male phase began simultaneously with spathe opening of the inflorescence and lasted approximately 11-12 days in both regions. The female phase began 5-6 days after inflorescence opening and lasted for approximately seven days in both regions. A five to six-day overlap between the male and female phases was observed, indicating a predominant self-pollination breeding behavior in KC. Notably, the extended female phase over the male phase explains the presence of natural hybrids among progenies produced through open pollination. Based on these results, a stepwise hand-pollination protocol was proposed for KC, involving emasculation, bagging, artificial pollination, and subsequent bag removal. This research enhances knowledge of the reproductive biology of KC and offers guidelines for breeding programs, conservation efforts, and the establishment of seed gardens.

Keywords: Controlled pollination, Female phase, Male phase

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