

Protogyny and herkogamy: implications for fruit formation in *Goniothalamus wynaadensis* (Bedd.) Bedd. (Annonaceae)

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The present study aims to evaluate the functional significance of protogyny and herkogamy in fruit development in *Goniothalamus wynaadensis* by conducting floral morphological analyses and controlled pollination experiments. The results of the flower morphology analysis indicate that the flowers exhibit cauliflorous, pendent, solitary, herkogamous, and hermaphroditic characteristics. The fruit survival rates after four weeks were found to be lowest in the control group (66.20 ± 1.10), followed by the self-pollinated group (97.60 ± 0.55) and the crossed pollination group ($98.5 \pm 1.0\%$). There was a statistically significant difference in the mean fruit set among the different manual pollination methods ($F = 1861, P < 0.05$). Zero fruit set percentage was observed in autogamy (bagging), while no significant difference ($P > 0.05$) in the mean number of monocarps at four weeks ($F = 2.799, P > 0.05$) and 17 weeks (10.80 ± 1.92) was found between the control and selfing ($P > 0.05$) groups respectively. The absence of autogamy and the presence of herkogamy are the contributing factors for the lack of reproductive assurance in this IUCN red-listed species.

Keywords: Autogamy, *Goniothalamus wynaadensis*, herkogamy, pollination, protogyny.