Pollen Morphology, Viability, and *In Vitro* Germination Studies in *Carica Papaya* L.

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Carica papaya L. belongs to the family Caricaceae which is a gynodioecious plant. The systematic morphological and floral diversity of Sri Lankan varieties are yet to be characterized. The objective of the study was to investigate the floral morphology, pollen viability and germination ability of the red lady variety and a local variety. The research was conducted at the Faculty of Technology, University of Ruhuna, Karagoda-Uyangoda, Kamburupitiya, Sri Lanka of IL1A agroecological region. The experiment was designed in Randomized Complete Block Design (RCBD) of 30 replicates in each variety with 1.8 X 1.8 m spacing. The floral morphology of two selected varieties was observed through visual observations and the light microscope. The dimensions of the flower morphology were measured using a vernier caliper. The pollen viability rate and the germination rate were tested with the iodine-potassium iodide test and the *in vitro* pollen germination test. Both the pollen viability rate and the pollen germination rate were observed through the imagery microscope and the hemocytometer using 3 replicates of each sample. The data were analyzed by t test through the Analysis ToolPak of MS Excel. Papaya has three flower types: female, male, and hermaphrodite. The male flower of the red lady had five petals and ten stamens while the local variety possessed four petals and eight stamens. The stamens' arrangement of the hermaphrodite flower of the two varieties was comparatively different. The height of the male (40.1 mm) and the hermaphrodite flowers (64.7 mm) of the red lady variety were significantly greater than local variety (30.7 mm and 48.8 mm, respectively). The *in vitro* germination rate of pollen from male flowers was significantly higher (22%) in local variety while the *in vitro* germination rate of the pollen from hermaphrodite flowers were significantly higher (50%) in red lady variety compared to local variety. The viability rate of the pollen from male flowers were higher in red lady variety (98%). The study highlights the importance of strengthen the production of local varieties and understand its yield potential.

Keywords: *Carica papaya* L., *In vitro* pollen germination, Pollen morphology, Pollen viability