

**DETERMINATION OF CULTIVAR DIFFERENCES
ON HEAT TOLERANCE IN COCONUT BY *IN*
VITRO POLLEN GERMINATION**

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ABSTRACT

Reproductive performance of coconut including pollen germination and pollen tube growth mainly depends on temperature. Therefore, identifying the effect of temperature on pollen germination percentage and pollen tube growth of new coconut cultivars is important to identify the suitable cultivars for heat prone areas. Two experiments were conducted to quantify the response of *in vitro* pollen germination and pollen tube growth to temperature and to determine the cardinal temperatures (T_{\min} , T_{opt} and T_{\max}) for coconut cultivars. New coconut hybrids which are evaluated by the Coconut Research Institute in the intermediate zone (IL1a) were used for the study. Pollen was collected from seven hybrids expressing variable tolerance to abiotic stresses. Pollen germination percentage and pollen tube growth were recorded after incubation in artificial growth media under different temperature regimes (16 °C to 39 °C; at 2 °C intervals). The optimum (T_{opt}), maximum (T_{\max}) and minimum (T_{\min}) temperatures (cardinal temperatures) for pollen germination and pollen tube growth of different cultivars were analyzed. Cultivars differed greatly for *in vitro* pollen germination percentage and pollen tube growth with mean values of 61% and 505 μm , respectively. A bilinear and quadratic models best described the response to temperature of pollen germination and pollen tube length. The mean cardinal temperatures (T_{\min} , T_{opt} and T_{\max}) averaged over cultivars were 16.7 °C, 28.3 °C and 39.2 °C for pollen germination and 18 °C, 28 °C and 37.7 °C for pollen tube growth. Based on these analyses, cultivars with higher pollen germination percentage and greater pollen tube growth under optimum temperatures and cultivars with higher T_{opt} and T_{\max} for pollen germination and pollen tube growth can be selected as tolerant to high temperature. It was clear, from this study, that Dwarf x Tall hybrids perform better than Tall x Tall hybrids with respect to *in vitro* pollen germination and pollen tube growth under high temperatures.

Key words- heat stress, pollen germination, pollen tube growth, cardinal temperatures, coconut, fruit set