

**EVALUATION OF ENVIRONMENTAL EFFECTS ON SELECTED
COWPEA (*Vigna unguiculata*) VARIETIES IN SRI LANKA**



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ABSTRACT

Cowpea, *Vigna unguiculata* is a vital legume in Sri Lanka, valued for its nutritional, economic, and soil-enriching benefits. This study aimed to evaluate the environmental effects on selected cowpea varieties in Sri Lanka. The seven cowpea varieties, *Bombay*, *Waruni*, *Dawala*, *MI35*, *MICP1*, *ANKCP1*, and *ANKCP2*, recommended by the Department of Agriculture, Sri Lanka used for the study. The experiment was conducted in the field of Gampaha District (Low country wet zone). The varieties were arranged in a pot experiment in a completely randomized design by using five replicates in each variety. Three consecutive planting sets were maintained at December (PD1), January (PD2), and February (PD3) with a one-month interval. Plant morphological traits and environmental factors, temperature, rainfall, humidity, and photoperiod were recorded for each planting set. The data was analyzed by Minitab 17 and R 4.4.3 statistical software. The results indicate that there is a significant variation of selected morphological characteristics at the sixth week after sowing in response to changing planting date; the plant height varied from (42.16 ± 6.17 cm by *Bombay*) at PD3 to (18.91 ± 2.35 cm by *MICP1*) at PD2. The number of leaves varied from (5.63 ± 5.25 by *MI35*) at PD2 to (2.53 ± 1.39 by *Dawala*) at PD3. The number of main stem nodes varied from (3.67 ± 0.41 by *Bombay*) at PD3 to (1.50 ± 0.87 by *ANKCP2*) at PD2. The number of main branches varied from (2.80 ± 0.45 by *Waruni*) at PD1 to (0.33 ± 0.47 by *ANKCP2*) at PD2. There is a significant interaction effect between planting date and variety on the days to flowering and the number of pods per plant. The plant height and number of main stem nodes were mainly affected by planting date and variety ($P < 0.05$). The number of leaves and the number of branchers are mainly affected by planting date only ($P < 0.05$). According to the PCA biplot, higher temperatures and longer photoperiods favor increased plant height and branching. Increased rainfall and humidity appear to negatively correlate with height but might enhance other adaptive traits. *ANKCP1* and *ANKCP2* performed similarly across all planting dates, showing stable growth patterns under varying climatic conditions. This information provides valuable guidance for cowpea breeding programs and agronomic practices, contributing to improved adaptation and productivity in Sri Lanka.

Keywords: Cowpea, Variety x environment interaction, Morphological variation

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