

INTER-POPULATION VARIATION IN SEED CHARACTERISTICS AND GERMINATION BEHAVIOR OF *Vigna marina*

D.J.M. De Silva^{*} and K.M.G.G. Jayasuriya

Department of Botany, Faculty of Science, University of Peradeniya, Sri Lanka
^{*}*jithmi7desilva111@gmail.com*

The biggest obstacle of the next century will be climate change, which impacts agriculture, particularly soil health. Soil salinity, one of the main issues facing world agriculture, is exacerbated by the effects of climate change. Crop improvement employing crop wild relatives of domesticated crops is one of the solutions to this challenge. *Vigna marina*, a wild relative of *Vigna* found in coastal regions, may tolerate high salinity, making it a valuable genetic resource. Understanding its inter-population variation is a key to conservation strategies. In this study, seeds from five different *V. marina* populations (Unawatuna, Mahamodara, Akurala, Negombo, and Thalpe) were used to determine inter-population variation based on seed morphometric parameters and germination behaviour under different salinity conditions (0, 100, 1000, 2000, 10,000, and 20,000 ppm NaCl solutions). Seed morphometric parameters were determined using 25 individual seeds per population, while four replicates of 25 seeds were used in germination experiments. Seed moisture content, seed shape index, and seed coat ratio in each population were significantly different from each other ($P < 0.001$). Seeds of all the populations showed reduced germination rates with increasing salinity. The highest cumulative germination percentage was observed when seeds were in 2000 ppm salinity compared to other salinity levels or distilled water across all the studied populations, demonstrating the halophytic nature of *V. marina*. Considering the median germination time (T_{50}), seeds collected from the Mahamodara population showed the highest germination rate ($T_{50} = 7.5$ days), while the Unawatuna population showed the lowest ($T_{50} = 11.25$ days) at 20,000 ppm. The study revealed that *V. marina* exhibits inter-population variations in the parameters analysed, indicating possible genetic diversity between populations. Therefore, it is recommended to conserve a sufficient number of populations to maintain the total genetic diversity.

Keywords: Crop wild relative, Inter-population variation, Salinity, *Vigna marina*