Root Growth Potential and Morphological Characteristics of *Jatropha curcas* L. Seedlings from Three Provenances

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Abstract

The study was conducted at the Institute of Renewable Natural Resources Nursery, College of Forestry and Natural Resources, University of the Philippines Los Baños to evaluate the quality of *Jatropha curcas* seedlings raised from three local provenances (Laguna, Palawan and Surigao). Specifically, it assessed the variations in the root growth potential (RGP) of *J. curcas* seedlings from three provenances; differentiated their morphological attributes; and determined the degree of relationships between their RGP and morphological traits. The experiment was laid out in a randomized complete block design (RCBD) with four replicates. The parameters were RGP, height, root collar diameter (RCD), length of longest root, seedling biomass, root-shoot ratio, and seedling quality index (SQI).

Among the three provenances, Laguna provenance produced taller seedlings that had higher RGP than those from Palawan and Surigao, which indicates that those from Laguna could be genetically superior than the other two provenances. No provenance variations were observed on the RCD, length of longest roots, seedling biomass, shoot-root ratio, and SQI. In addition, all the seedlings, regardless of provenance, were top heavy and could be susceptible to moisture stress and desiccation when outplanted in drought prone areas.

Seedling height and RCD were correlated with all the morphological traits, except shoot-root ratio. This means that either height or RCD can be used to estimate the other morphological traits of *J. curcas* seedlings. Additionally, RGP is positively correlated with all the morphological traits, except shoot-root ratio; and a strong positive correlation was also observed between SQI and all the morphological attributes of the *J. curcas* seedlings.

***Keywords**: root growth potential, seedling morphological traits, seed quality assessment, seedling quality index*