

Morphological, Molecular and Biochemical Characterization of a Seedling Population from a Cross-Pollinated Mother Plant of *Cinnamomum zeylanicum* Blume (Cinnamon)

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Cinnamomum zeylanicum Blume, commonly known as true cinnamon, has been used for culinary and medicinal purposes for centuries. It has gained more attention recently due to scientific evidence on its medicinal properties and possible industrial applications. Nevertheless, it is essential to have a continuous supply of quality raw materials to sustain such industries. The quality and quantity of yield primarily depend on its genetic basis. Interestingly the cinnamon flower has been evolved for cross-pollination, which may lead to variation in offspring. A study was conducted to assess the morphological, molecular and biochemical diversity of a selected population of offspring from a single mother plant. A vegetatively propagated plantation with alternate rows of popular local varieties, *Sri Wijaya* and *Sri Gamunu* were selected for the study. Ten seedlings from a selected *Sri Wijaya* plant grown under a controlled environment were evaluated for age and environment independent leaf phenotypic characters. Of them, leaf shape and leaf apex were significantly different among individuals compared to mother plant while leaf base was not significantly different among them ($P \leq 0.05$). The same seedlings and the parents were assessed with seven polymorphic Inter Simple Sequence Repeats (ISSR) regions. The data suggest a considerably high genetic diversity among them with 81% of polymorphic bands and higher Nei's diversity index and Shannon's Information Index. Four randomly selected individuals from the same population were assessed for biochemical composition using High-Performance Liquid Chromatography (HPLC). The concentration of tested compounds was determined by developing a standard curve using external standards with an R^2 value of 0.99 for trans-cinnamaldehyde, eugenol, coumarine, coumaric acid, cinnamyl alcohol, and cinnamyl acetate. Results showed a significant variation in chemical contents among tested seedlings. Current findings suggest that a considerably high genetic variation created due to cross-pollination may possibly attribute to morphological and biochemical differences among individuals.

Key words: *Cinnamomum zeylanicum* Blume, Genetic diversity, ISSR, Morphology diversity, True Cinnamon