

Genetic diversity and differentiation of *Aquilaria malaccensis* Lam. using RAPD markers

ABSTRACT

Aquilaria malaccensis Lam. (family Thymelaeaceae) commonly known as agarwood or gaharu producing tree in Malaysia. The tree is being heavily exploited due to its highly valuable agar oil used in the production of high grade perfumes and traditional medicines. Consequently, their population in nature is threatened greatly. Conservation of this tree species is of the main concern, however, identification of *A. malaccensis* from other *Aquilaria* sp. based on morphology is very difficult and time consuming. This study aimed to determine the genetic diversity among three selected *Aquilaria* sp. namely *A. malaccensis*, *A. sinensis* (Lour.) Spreng. And *A. subintegra* Ding Hou using random amplified polymorphic DNA (RAPD) markers and to differentiate *A. malaccensis* from *A. sinensis* and *A. subintegra*. Out of ten RAPD primers, four primers (G12, R15, U13 and OPA 05) produced the most clear and reproducible bands. A total of 24 bands were scored from the four primers. Construction of dendrogram resulted in two major clusters; cluster I consisted of only *A. malaccensis* accessions, and cluster II consisted of *A. subintegra* and *A. sinensis* accessions. This indicates that *A. subintegra* is more closely related to *A. sinensis* while *A. malaccensis* is genetically distant from both. Species-specific bands for *A. malaccensis* were produced at 875, 1000 and 2500 bp by G12 primer, and at 2500 bp by OPA 05 primer. This study laid the foundation for a creation of rapid and cost effective molecular identification of *A. malaccensis*.

Keyword: *Aquilaria malaccensis*; Agarwood; Gaharu; Genetic diversity; RAPD; Molecular identification; self-pollination; Fruit sets; Herkogamy; Homogamous; Passion fruit