

Genetic variation and DNA fingerprinting of durian types in Malaysia using simple sequence repeat (SSR) markers

ABSTRACT

Durian (*Durio zibethinus*) is one of the most popular tropical fruits in Asia. To date, 126 durian types have been registered with the Department of Agriculture in Malaysia based on phenotypic characteristics. Classification based on morphology is convenient, easy, and fast but it suffers from phenotypic plasticity as a direct result of environmental factors and age. To overcome the limitation of morphological classification, there is a need to carry out genetic characterization of the various durian types. Such data is important for the evaluation and management of durian genetic resources in producing countries. In this study, simple sequence repeat (SSR) markers were used to study the genetic variation in 27 durian types from the germplasm collection of Universiti Putra Malaysia. Based on DNA sequences deposited in Genbank, seven pairs of primers were successfully designed to amplify SSR regions in the durian DNA samples. High levels of variation among the 27 durian types were observed (expected heterozygosity, $HE = 0.35$). The DNA fingerprinting power of SSR markers revealed by the combined probability of identity (PI) of all loci was 2.3×10^{-3} . Unique DNA fingerprints were generated for 21 out of 27 durian types using five polymorphic SSR markers (the other two SSR markers were monomorphic). We further tested the utility of these markers by evaluating the clonal status of shared durian types from different germplasm collection sites, and found that some were not clones. The findings in this preliminary study not only shows the feasibility of using SSR markers for DNA fingerprinting of durian types, but also challenges the current classification of durian types, e.g., on whether the different types should be called "clones", "varieties", or "cultivars". Such matters have a direct impact on the regulation and management of durian genetic resources in the region.

Keyword: DNA fingerprinting; *Durio zibethinus*; Genetic diversity; Microsatellite markers

