

Genetic diversity of lemba (*Curculigo latifolia*) populations in Peninsular Malaysia using ISSR molecular markers

ABSTRACT

Genetic diversity of 45 populations of lemba (*Curculigo latifolia*) collected from various ecotypes of Peninsular Malaysia was analyzed using ISSR markers. Initially, 12 ISSR primers were selected and applied on populations. Only seven primers were found to produce polymorphic and reproducible bands. The seven ISSR primers generated a total of 162 amplification products, of which the percentage of polymorphic bands for populations ranged from 22.22 % to 72.22 %. Mean Nei's gene diversity value (h) and mean Shannon's Information Index (I) estimated from the 45 populations were 0.1915 and 0.2861, respectively. Furthermore, when all 45 populations pooled, h and I were 0.3697 and 0.5504, respectively. The coefficient of genetic differentiation among populations (G_{ST}) was 0.48. The results of AMOVA showed highly significant genetic differences among and within populations. Of the total genetic variation among 225 *C. latifolia* samples collected from 45 populations of 11 states, 62% was due to genetic differences within populations, while only 38% was due to variations among populations. Result of the Mantel test showed that there was no significant relationship between genetic distance among populations and geographical distance among the collection sites ($r = 0.22$). This pattern was further confirmed by the UPGMA tree constructed based on Jaccard's genetic similarity coefficients. The populations could be generally grouped into eight major clusters, each mostly presents populations from the same state. The average genetic similarity between populations equaled 0.606. The principal coordinate analysis (PCoA) revealed similar grouping of the populations. In conclusion, a wide range of genetic diversity was revealed among and within the *C. latifolia* populations studied. These variations could be utilized for further breeding purposes to produce new *C. latifolia* varieties.

Keyword: Lemba; *Curculigo latifolia*; Genetic diversity; ISSR; Peninsular Malaysia