

In vitro mutagenesis of *Etlingera elatior* (Jack) and early detection of mutation using RAPD markers.

Abstract

Mutation breeding techniques in combination with tissue culture and molecular marker methods provide a powerful tool for improvement of vegetatively propagated plants. The aim of this study was to develop a protocol for shoot regeneration and mutation induction of *Etlingera elatior*. The results of irradiation on in vitro buds of *E. elatior* showed LD50 to be 10 Gy, with the survival of explants being sharply reduced at this dosage. All 8 selected gamma irradiated regenerants were differentiated from the untreated control based on the banding patterns obtained using 9 primers, which generated 59 reproducible bands, whereby 35 (55.31%) were found to be polymorphic. Jaccard's coefficient of similarity values ranging from 0.537 to 0.860 were indicative of the level of genetic variation among the mutants studied. For comparison between the potential lines (PL) and the control, a maximum similarity value(0.814) was observed in PL1 mutant, while the minimum value (0.537) was observed in PL7. In summary, a combination of irradiation, regeneration, multiplication, and random amplification of polymorphic DNA (RAPD) analysis for early screening of mutants can speed up the breeding program of *E. elatior*.

Keyword: *Etlingera elatior*; Genetic variation; Mutation; RAPD.