

## Molecular and phytochemical characterization of *Acalypha indica* L. in Tirunelveli hills

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In the present study, *Acalypha indica* L. was collected from ten locations in Tirunelveli hills and the genetic variability was investigated using RAPD-PCR fingerprint and the population which showed high percentage of polymorphism was selected. The selected populations were further subjected to phytochemical analysis. The active principle in these plants was quantified by HPLC analysis. The population which exhibited both high percentage of polymorphism and high amount of active principle was considered as the superior genotype.

Key words : *Acalypha indica*, Genetic variability, RAPD, Active principle, HPLC, Superior genotype

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### INTRODUCTION

An herbal medicine may consists of hundreds of phytochemicals, and their contents vary depending on climate, regions of cultivation and seasons of harvest which make it difficult to ensure batch-to batch uniformity. The quality control of standardized herb extracts is essential for the therapeutic reproducibility, efficacy and safe application of extract. HPLC method is gaining importance for qualitative and quantitative analysis of plant extracts, being useful for quality control of phytochemical compounds (Daniele *et al.*, 2006).

Phytochemical differences are directly or indirectly linked to the genetic diversity. DNA markers based fingerprinting can distinguish species rapidly using small amounts of DNA and therefore, can assist to deduce reliable information on their phylogenetic relationships. Various approaches are available for DNA fingerprinting such as AFLP (Amplified fragment length polymorphism), SSR (Simple sequence repeats) and RAPD (Random amplified polymorphic DNA). RAPD is convenient to conduct with good polymorphism and can be used in analyzing genetic diversity and the relation between species. It is been used in analyzing the relationships and genetic diversity in many plants, especially medicinal plants (Lanying *et al.*, 2009).

Although RAPD is of dominant nature, several strategies have been put forth to minimize the dominance effects on genetic variation analysis (Stewart and Excoffier, 1996). In occasional cases, RAPD is poor in reproducibility but this can usually be solved by optimization of reaction conditions. RAPD analysis requires only a small amount of genomic DNA and can produce high level of polymorphism and may facilitate more effective diversity analysis in plants (Szmids *et al.*, 1996).

Assessment of genetic diversity prevalent in the germplasm needs immediate attention for the improvement of a species (Lakhanpaul *et al.*, 2003). To understand the effective management of plant genetic diversity from a conservation point of view, it is essential to consider the variation richness and distribution at intra and interspecific levels. Information about genetic diversity is important not only for study of the flora, but also to elaborate strategies of conservation and rational use of genetic resources (Viccini *et al.*, 2004).

*Acalypha indica* Linn. belongs to the family Euphorbiaceae, it is an erect, annual herb. The whole plant is used as medicine to treat skin diseases, constipation, ulcers and bronchitis. The plant contains a cyanogenetic glucoside and two alkaloids *viz.*, acalyphine and triacetoneamine. The other constituents are n-octasanol,