PROJECT PROFILE

Title**: Assessment of Genetic variability and development of Gender specific DNA marker studies in *Canarium strictum* Roxb.- an economically important NTFP species**

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Co Investigators**:** Dr. A. C. Surya Prabha, Scientist-E

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Duration: 2021-2024.

Objectives:

- To assess genetic variability of *Canarium strictum in* natural populations of Tamil Nadu.
- To develop gender specific DNA marker in *Canarium strictum.*

Funding Agency: Tamil Nadu Forest Department.

SUMMARY

Canarium strictum Roxb. is an indigenous, non-timber forest produce tree species distributed in the Eastern and Western Ghats. Its resin is commercially referred as "Dammar" has medicinal as well as therapeutic use. The species is rich source for "Sambrani" which is used to cure various bronchial ailments. Due to its overexploitation, the taxa have become an endangered species and, therefore, recalls for urgent attention for its conservation. In this context a study was conducted on the diversity assessment and gender specific DNA marker development of *Canarium strictum* with a collaboration of Tamil Nadu Forest Department.

In this project an extensive survey was carried out for identification of Candidate Plus trees (CPTs) in Western and Eastern Ghats of Tamil Nadu. Sixteen Candidate Plus Trees (CPTs) of *Canarium strictum* were identified in Kolli hills Namakkal Dt (Eastern Ghats) and Yercaud, Salem Dt.(Eastern Ghats). Twenty six Candidate Plus Trees (CPTs) of *Canarium strictum* were identified in Kothagiri Nilgiri Dt (Western Ghats) and Valparai RF,

Coimbatore Dt. (Western Ghats). The tree height ranged between 25m - 40m with the girth of 1.5m - 3.5 m in the Western Ghats whereas the range of tree height was 35m - 45m with the girth of 2m - 4m in Eastern Ghats. Seed morphology, bark morphology, Soil physico chemical properties were studied in Eastern and Western Ghats.

Genomic DNA was extracted from leaves samples of *Canarium strictum*. DNA was extracted using ArboEasy Kit developed by ICFRE-IFGTB. The DNA extracts were then subjected to PCR amplification with Inter Simple Sequence Repeats (ISSR) DNA markers for diversity study. The marker data were analysed using (NTSYSpc) software. The genetic relationships of the Candidate Plus Trees (CPTs) of *Canarium strictum* based upon the cluster analysis depicted genetically distinct clusters form found in Western & Eastern Ghats populations. Biochemical study was carried out for quantifying phenol contents in male and female samples. Phenol concentration was higher in male than female sample.

Further a transcriptome study was conducted from leaf tissue of *Canarium strictum.* SSRs were identified from the transcriptome sequence. Twenty new SSR primers were designed using Primer3 software. The newly synthesized SSR primers have eleven tri repeats, four penta repeats, 5 hexa repeats. Eight SSR primers were identified initially for gender discrimination in male, female individuals of *Canarium strictum.* Further microsatellite profiling in nine male, nine female individuals from Eastern and Western Ghats populations of Tamil Nadu were screened for gender discrimination studies. Among the eight SSR primers two primers had specific amplicon size appeared in the female which discriminates the gender in Canarium.

Bark morphology study revealed peeled bark structure in males and smooth bark structure in females indicating these character could be used to identify male and female trees of *Canarium strictum* in the field.