

Progress of NFRP ongoing projects

- 1. Project Title & Code** : Screening and evaluation of *Mitragyna parvifolia* (Roxb.) Korth an indigenous timber species for genetic potential.
- 2. Name of the Principal Investigator** : Dr. D. Rajasugunasekar
- 3. Date of start & duration** : April 2021 -2026 (Five years)
- 4. Total Budget** : Rs.25.70 lakhs

Main Objectives :

1. Catalogue the spectrum of variations that exists in the species among and with the species in different agro-climatic zones of Tamil Nadu.
2. To initiate the phenotypic selection based on the wood volume.
3. Study the phenology and reproductive behavior of *M.parvifolia*.
4. Genetic diversity assessment in *M. parvifolia* through molecular markers.
5. Characterization of the wood properties (cellulose/ lignin content, fibre characteristics, density, moisture content, shrinkage, bending strength, stiffness, compressive strength) of plus trees to assess the variation
6. To establish half-sib progeny trials for further improvement.

6. Outline of Research Programme (yearly plan of action):

Year	Activity
First	<ul style="list-style-type: none">• Extensive field survey, Identification of current plantation/population of possible sources of <i>M. parvifolia</i> trees in southern India.• Collection of seeds and vegetative propagules from superior CPTs• RNA isolation from leaf tissues, transcriptome sequencing, <i>de novo</i> assembly & SSR mining in <i>Mytragyna parvifolia</i>.• Microsatellite primer designing and synthesis (approx. 50 primer pairs).• Collection of wood samples and characterization of the wood properties (wood density, moisture content, shrinkage, bending strength, stiffness, compressive strength cellulose/ lignin content and fibre characteristics) of plus trees to assess the variation
Second	<ul style="list-style-type: none">• Survey and selection of <i>M. parvifolia</i> in Southern India• Collection of seeds and vegetative propagules from superior CPTs• Standardization of nursery techniques for large scale planting programme.• Understanding phenology and reproductive behavior of <i>M. parvifolia</i> and collection of seeds from selected plus trees.

	<ul style="list-style-type: none"> • Leaf sample collections from approximately 100 CPTs of <i>Mytragyna parvifolia</i> from natural populations in Tamil Nadu and Kerala. • DNA isolation and quantification. • Screening for polymorphic markers will be based on amplification success and polymorphism of the primer pairs in randomly selected individuals. • SSR profiling of different individuals using polyacrylamide gel electrophoresis (PAGE) and silver staining. • Collection of wood samples and characterization of the wood properties (wood density, moisture content, shrinkage, bending strength, stiffness, compressive strength cellulose/ lignin content and fibre characteristics) of plus trees to assess the variation.
Third	<ul style="list-style-type: none"> • Study morphological and reproductive variations among selected individuals of <i>M.parvifolia</i>. • Understanding phenology and reproductive behavior of <i>M. parvifolia</i> and collection of seeds from selected plus trees. • To continue of SSR profiling of different individuals using polyacrylamide gel electrophoresis (PAGE) and silver staining. • Data of SSR marker analysis will be carried out using different softwares. • Collection of wood samples and characterization of the wood properties (wood density, moisture content, shrinkage, bending strength, stiffness, compressive strength cellulose/ lignin content and fibre characteristics) of plus trees to assess the variation.
Four	<ul style="list-style-type: none"> • Assemblage of germplasm bank. • Establishment of progeny trails in different agro climatic zones
Five	<ul style="list-style-type: none"> • Maintenance of germplasm bank and progeny trial in different locations. • Data collection. • Report preparation.

7. Progress of the project in brief:

Intensive survey has been made in the southern, Northern and western agroclimatic zone of Tamil Nadu. 70 CPTs have been identified based on the wood volume. Leaf sample have been collected for the molecular studies. Transcriptome sequence data Analysis in *Mytragyna parvifolia*. Seeds have been collected in the selected CPTs and seedlings being raised in the GTI nursery.) 1.0 acre Mythagyna

parvifolia half sib progeny trial and 0.5 acre have been established in Thuvanagkurichy and Kurumbapatti Field Research Station. Periodical data has been collected. More than 95% survival has been recorded.

8. Action taken on the recommendation of RAG 2023:

Modification sought for restricting the project for Tamilnadu.

- Catalogue the spectrum of variations that exists in the species among and with the species in different agro-climatic zones of Tamilnadu.

Accordingly RAG approved the required modifications.