PROJECT PROFILE

Title: Threatened Species Recovery Research for Silentvalley and Kolli hills MPCAs of Kerala and Tamilnadu

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Start and Completion dates: April 2000- Jan-2004

Objectives:

1. Spatial distribution and mapping of Red listed species population.
2. Population dynamics (Density, Natural regeneration and Girth Class distribution.)
3. Reproductive Biology and conservation genetics studies.
4. Seed collection, germination storage and propagation studies.
5. Factors that threat survival of species

Funding Agency: Foundation for Revitalization of Local Health Traditions (FRLHT), Bangalore

Total Budget: Rs. 10.75 lakhs

SUMMARY

- This project dealt with ecological evaluation of certain medicinal plants; study their conservation biology and restoration prospects in two Medicinal Plant Conservation Area (MPCA) at Silentvalley (Kerala) and Kolli Hills (Tamil Nadu), aims at inventorization of 21 red listed medicinal plant species, their reproductive biology, seed biology and population structure in those sites. The species are *Aphanamixis polystachya, Cinnamomum sulphuratum, Emblia ribes, Garcinia gummi-gutta, Garcinia morella, Glycosmis macrocarpa, Hydnocarpus alpina, Nothapodytes nimmoniana, Myristica malabarica, Piper mullesua, Plactranthus nilagiricus* and *Symplocos racemosa* (Silentvalley) *Aristolochia tagata, Celastrus paniculatus, Rhaphidophora laciniata, Santalum album* and *Symplocos cochinchinensis* (Kolli hills), *Canariun strictum, Myristica dactyloides, Persea macrantha* and *Smilax zeylanica* (common for both sites).

- Majority of the species showed contiguous distribution (individuals of a species distributed together) in both the sites. In Silentvalley MPCA, *Aphanamixis polystachya, Canariun strictum Cinnamomum sulphuratum, Embelia, ribes, Glycosmis macrocarpa Hydnocarpus alpina, Nothapodytes nimmoniana* are found to be threatened in varying degrees. In Kolli hills, populations of *Aristolochia tagala* and *Raphidophora laciniata* are restricted to a very few patches. In *A.tagala* the problem is related its breeding system. It needs specialist pollinators (very small flies), in which nothing is known about their life history cycles. A very low fruit-flower ratio in Kolli is clearly indicative of pollinator limitation as well as its preferential out crossing nature.

- Pollinator limitation seems to be a major threat as many species require specialist pollinators. In case of *S. zeylanica and S.cochinchinensis* plenty of solitary bees are found to be potential pollinators. Kolli Hills, being a centre of horticulture, leads to extensive usage of inorganic fertilizers and pesticides within the region. This has a direct effect on populations of pollinators and birds that aid in seed dispersal.

- *A.tagala, S.cochinchinensis* and *E.ribes* no bottle neck could be noticed during the pre-zygotic or during process of zygote development. It is during the post zygotic phase most seeds are lost in the form of herbivory. Species such as *Smilax, Aristolochia, Embelia* and *Canarium* show high rates of germination under controlled conditions, thus establishing nursery at study sites would aid in achieving higher seed to seedling ratio. In *Embelia ribes* fruit production is high, but very poor natural regeneration is a threat factor.

- Scanty information was available for propagation and *ex-situ* conservation of these species in seed banks. Seed handling techniques for *Aristolochia tagala, Canarium strictum, Garcinia gummi-gutta, Persea macrantha Symplocos racemosa, Embelia ribes, Smilax zeylanica and Myristica dactyloides* have been standardized. The study indicated that the seeds of *A.tagala* germinate readily and can be stored up to 18 month without serious loss its viability. Germination of *Canarium strictum* seeds required some pre- treatment. The seeds can be stored at 20^{o}C for 10 months with 42% germination. Seeds of *Persea macrantha, Symplocos racemosa and Myristica dactyloides* were found to be sensitive to desiccation. Seed germination studies on *E.ribes* reveal necessity of pretreatment with GA3.