

Ethnoecology and Phytochemistry of Medicinal Plants in the Nilgiri Biosphere Reserve



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Natural History**



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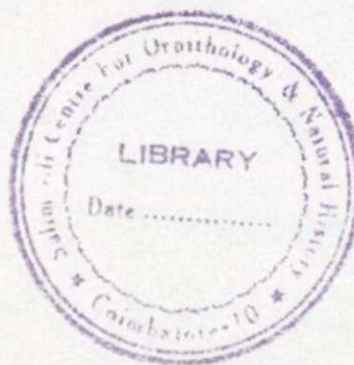
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FINAL REPORT

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Photo credit: Front Cover : Undisturbed riverine forests - *P. Balasubramanian* -
Inset: Tribal medicine man exhibiting medicinal products - *S. N. Prasad*
Back Cover : Top to bottom: 1. Dry deciduous forest - *N. Sivaganesan* -
2. A tribal home garden - *P. Balasubramanian* -
3. Disturbed riverine forest - *P. Balasubramanian* -
4. Degraded dry mixed deciduous forest - *P. Balasubramanian*

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ABSTRACT

Medicinal plants constitute a very important natural resource because about 80% of the people in developing countries rely on plant based drugs. They are important as an integral part of traditional therapy of local people and as a possible source of valuable phytochemicals. Tropical forests represent a great store house of medicinal genetic resources. Over 95% of the medicinal plants used by the pharmaceutical industries are collected from wild. The traditional use of a plant may be an indication of the presence of chemicals valuable to medical progress. About 75% of the 121 biologically active plant-derived compounds presently in use world wide, have been discovered through ethno-medical approach.

Therefore, the need for documentation of tribal knowledge on plants, studying the status and ecology of medicinal plants under pressure from humans and chemical screening of potential medicinal species were found important. Hence, a comprehensive study involving all the above three aspects was launched in Nilgiri Biosphere Reserve, Western Ghats which is identified as one of the biodiversity hot spots.

The major objectives of the study are:

1. to document ethnomedicinal uses of plants by surveying a few less studied tribal groups of NBR,
2. to study the status and ecology of medicinal plants, and
3. to initiate preliminary phytochemical analysis of a few select ethnomedicinal species recorded during the present study.

After reconnaissance surveys and literature screening the study sites and local tribal groups were fixed. To study the status and distribution of medicinal plants sampling was done in Wynaad Wildlife Sanctuary, Attappady valley and Coimbatore Forest Division. For documentation of tribal knowledge, Irulas followed by Kurumbas, Kattunaickens and Mudugas were given major focus. Preliminary phytochemical screening was done on four species.

Medicinal uses of plants were recorded by interviewing and recording the information from elderly tribal people. The abundance and density of medicinal plants were studied by sampling 2 ha. each in four major vegetation types in NBR (dry deciduous, moist deciduous, dry mixed deciduous and riparian forests). 0.1 ha. plots were used for sampling trees; 5 sq.m quadrats for shrubs and 1 sq.m quadrats for herbs and regeneration class.

Commercially exploited species were identified by interviewing tribals and settlers, some of whom act as local dealers. Overall abundance and density of medicinal plant species was compared between disturbed and undisturbed sites.

During the present study, 188 ethno medicinal plants belonging to 72 families were recorded from four tribal groups, which included 15 new ethnomedicinal plants and 56 new uses. Euphorbiaceae (14 spp.) followed by Verbenaceae and Acanthaceae were the dominant families contributing the ethno medicinal plants. Herbs contributed the maximum (34.9%) of ethnomedicinal plants. Among the various parts used, roots/ rhizomes contributed the maximum (32.1%) followed by leaves (30.8%). *Glycosmis pentaphylla*, *Helicteres isora* and *Cyclea peltata* were the first three species among the most commonly used medicinal plants by Irulas. From the point of view of diseases treated, maximum number of species (n=29) were used to treat digestive disorders.

Twenty seven species of commercially exploited plants were identified during the present study. Along with 58 species reported by other authors, the total number of commercially exploited species comes to 85, which also includes three endemics. Majority of the commercially exploited species were contributed by trees (37%). Among the 85 species 42% were exploited for unserground parts (roots/ rhizomes/tubers) and 10% for reproductive parts (seeds, fruits).

Destructive harvesting, that is the collection of whole plants, roots, rhizomes and ring barking of trees was noticed in several species. Dry forests are one of the most threatened habitats in NBR; 34% (29/85) of the commercially exploited species occur in dry deciduous and scrub forests.

Species richness of ethno medicinal plants was highest (69) in the moist deciduous forests followed by riparian forests (62). A comparison between slightly disturbed and undisturbed habitat showed lower values of species richness, diversity and overall density of medicinal trees and shrubs in the disturbed dry deciduous forests. Total density of seedlings and saplings were also found lower in the disturbed site. A similar trend was observed for riparian forests also. In the disturbed riverine forest 12 trees and 15 shrubs were recorded whereas in the undisturbed riverine forest site, 23 trees and 21 shrubs were recorded. Teak plantations were also rich in medicinal plant wealth; 39 medicinal plant species including 3 endemics and one threatened species were recorded here. Of the 35 commercially exploited species recorded in the quadrats, eight species had a narrow distribution, that is they occurred in only one habitat. Four species showed poor regeneration, which might be due to over-exploitation.

Of the five medicinal plant species screened, steroids and alkaloids were found in all the five species. Phenolic compounds were observed in four species and all the five species gave negative results for triterpenoids. These results were compared with results already obtained from related genera and verified for the possible correlation between uses reported and chemicals identified during screening.