

## Ethno-medicinal Survey of Threatened Plants in Eastern Ghats, India

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### Abstract

An ethnobotanical study was conducted from 2004 to 2006 to investigate the uses of threatened medicinal plants by local tribal people in Eastern Ghats of India. Information on names of plants, part used and medicinal uses was gathered from 160 randomly selected respondents using semi-structured questionnaires. The results obtained revealed that 42 plants were used as a cure of 25 ailments belonging to 30 families. All the plants collected from the study area were either endemic or threatened. The need for the conservation of these threatened plants cannot be over emphasized as most tribal people in the study area depend mostly on herbs from these species. Proper conservation and management plans are suggested to conserve the medicinal plant resources before it lost forever.

**Key words:** Conservation, Threatened medicinal plants, CAMP, Eastern Ghats, India

### Introduction

The Eastern Ghats (11°30' to 22°34'N and 77°22' to 87°29'E) are a long chain of broken hills and elevated plateaus, running along the Indian east coast and passes through the states of Orissa, Andhra Pradesh, Tamil Nadu and two districts of Karnataka. It extends over 2,000 km with average width of about 100 km. The wide range of topography, varied climate favours luxuriant growth of vegetation and forest with number of invaluable medicinal plant species (Rawat, 1997). This region is also abode of many endemic elements and a number of species which have become rare, threatened or endangered (Ahmedullah and Nayar, 1987; Balaguru *et al.*, 2006; Reddy *et al.*, 2006). Indiscriminate resource utilization, forest as well as non-forest due

to increase in population and urbanization is leading to rapidly deplete the plant resources day-by-day.

Although number of ethnobotanical studies has done in Eastern Ghats, these studies were conducted on scattered basis on different ethnic groups. No such study is carried out so far on ethnomedicinal utilization of endemic and threatened plants. The present study being reported here is part of a completed project aimed at evaluation of medicinal plant species and their conservation in Eastern Ghats currently being conducted at the National Remote Sensing Centre, Hyderabad.

### Materials and methods

Several field trips were undertaken in tribal areas of the Eastern Ghats during 2004 to 2006 (Figure 1). At each time of visit, different tribal hamlets and forest pockets were chosen in different seasons to collect more information on plants. Information was compiled through scientifically guided questionnaires (Jain, 1991), interviews and general conversations with several tribal herbal healers, village heads, elder women and other local informants. A total of 160 persons from eight primitive tribal communities (20 persons from each tribe) were interviewed. The plants were initially identified by their vernacular names through consultations with the local people. Voucher specimens were prepared and deposited in the Herbarium of Botany Department, Kakatiya University (KUH), Warangal, Andhra Pradesh. Proper scientific identification of the plants was done after consulting regional floras (Gamble, 1928; Saxena and Brahmam, 1996; Pullaiah, 1997; Pullaiah and Chennaiah, 1997; Pullaiah and Moulali, 1997).

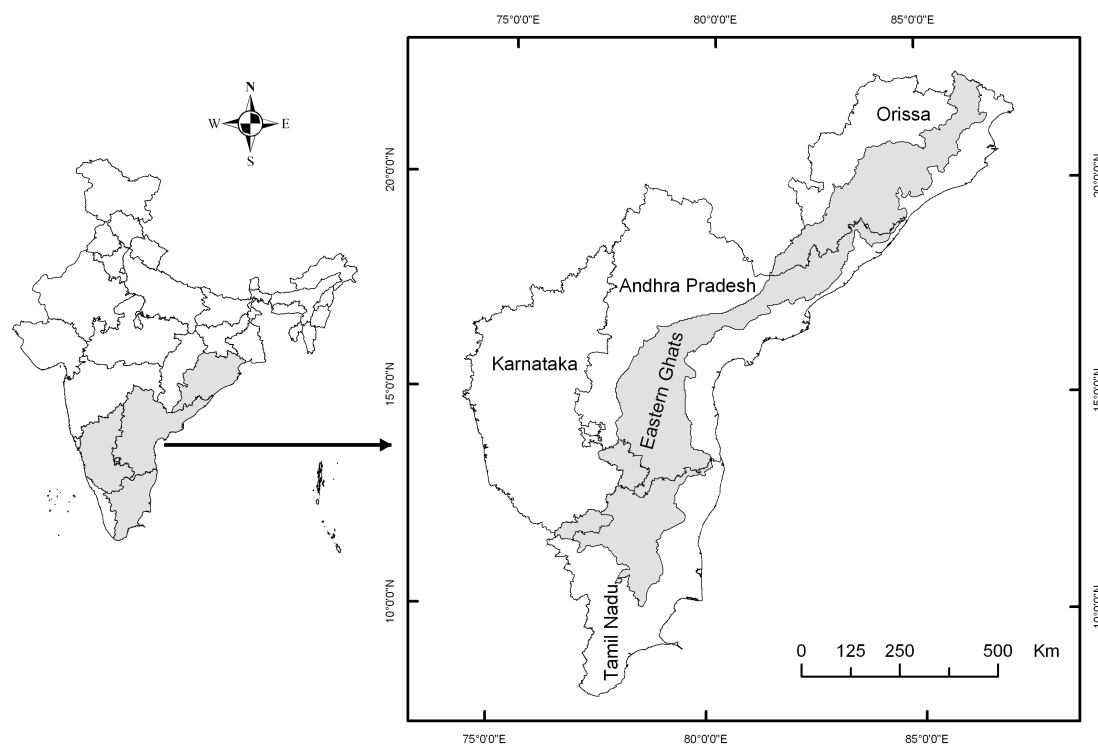
The threat status of the identified plant species in the study area was defined after consultation with relevant literature (Jain and Rao, 1983; Nayar and Shastry, 1987-1990; Jadhav *et al.*, 2001; Leaman, 2005) and Conservation Assessment and Management Planning (CAMP) reports of India. According to Champion and Seth (1968), three major phenological vegetation types (semi evergreen, moist deciduous, dry deciduous) are found in the Eastern Ghats of India. The source of plant collection from respective forest types was also carefully noted. The plants are enumerated alphabetically with their botanical name with author citation, family name, local name, habit, source of collection, part used, medicinal uses and threat status (Table 1).

## Results and discussion

The results of the study have revealed 42 plant species belonging to 30 families distributed in 41 genera that are frequently used for treatment of 25 diseases by local tribes, herbalists and traditional healers (Table 1). Among them 16 were herbs, 13 were trees, 10 were climbers and 3 were shrubs. Members of the family Asclepiadaceae and Papilionaceae are the most commonly used. As seen in Table 1, common health ailments in the study area were skin problems such as eczema, wounds and cuts. This is because of tribals are maintaining ancient style of living i.e., forest dwelling and hence are more prone to get skin cuts and skin allergies because of spiny and thorny plants and so also due to the different pollen grains or stinging hairs of some plants.

The second important disorder observed is of stomach complaints *viz.* dysentery, indigestion, stomach pain, etc. This may be because of poor hygiene and sometimes use of contaminated water. A total of 7 plants are employed for various stomach complaints. Of the total uses, three are of stomachache, two of each for indigestion and dysentery. Due to round the year exposure to thick forests, many cases of snakebites are also reported. Hence, there is always search for powerful remedies by trial and error method, which has resulted in the development of reliable ethnomedicine for treating snakebites. Tuber of *Habenaria roxburghii* and root of *Rauvolfia serpentina* are used against snakebite.

Present study has revealed that medicinal plants still play a vital role in the primary healthcare of the people of this region. During the survey, it was observed that more than half of the total number of people questioned regularly used medicinal plants



**Figure 1.** Map of Eastern Ghats, India showing the study area.

**Table 1.** Threatened plants used ethnomedicinally in Eastern Ghats of India.

Species name	Family	Local name	Habit*	Source of collection**	Part used*	Medicinal uses	TS
<i>Acorus calamus</i> L.	Araceae	Bacha	H	MD	Rh	Indigestion	EN
<i>Albizia thompsonii</i> Brandis	Mimosaceae	Velugu Chinta	T	DD	Sb	Skin diseases	VU
<i>Boswellia ovalifoliolata</i> Balakr. & Henry	Burseraceae	Guggilam	T	DD	Re	Scorpion sting	EN
<i>Celastrus paniculatus</i> Willd.	Celastraceae	Karsona	C	MD	Sd	Rheumatism	NT
<i>Ceropegia spiralis</i> Wight.	Asclepiadaceae	Nimmatigadda	C	DD	Tu	Indigestion	VU
<i>Costus speciosus</i> (Koenig) Sm.	Costaceae	Kevu kane	H	MD	Tu	Rheumatism	NT

<i>Crotalaria paniculata</i> Willd. var <i>nagarjunakondensis</i> Thoth.	Papilionaceae	Gutta Vempali	H	DD	R	Eczema	DD
<i>Curcuma inodora</i> Blatter	Zingiberaceae	Chara Pasupu	H	MD	Tu	Swellings due to wounds	VU
<i>Curcuma psedomontana</i> Grah.	Zingiberaceae	Adavi Pasupu	H	MD	Rh	Antiseptic	VU
<i>Cycas beddomei</i> Dyer	Cycadaceae	Paireetha	S	DD	Mc	Prevents pregnancy	CR
<i>Decalepis hamiltonii</i> Wight. & Arn.	Asclepiadaceae	Nannari	C	DD	R	Health tonic	EN
<i>Decaschistia cuddapahensis</i> Paul & Nayar <sup>a</sup>	Malvaceae	Magasiri Gadda	S	DD	R	Aphrodisiac	---
<i>Dendrobium macrostachyum</i> Lindl.	Orchidaceae	Radam	H	MD	S	Earache	VU
<i>Embelia ribes</i> Burm.f.	Myrsinaceae	Vayu vidangalu	C	SEG	Rb	Asthma	CR
<i>Entada pursaetha</i> DC.	Papilionaceae	Gilla chettu	C	SEG	Sd	Ulcers	EN
<i>Glochidion tomentosum</i> Dalz.	Euphorbiaceae	Pageri	T	SEG	L	Wounds	VU
<i>Gloriosa superba</i> L.	Liliaceae	Agnisikha	C	SEG	Tu	Abortifacient	VU
<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Schult.	Asclepiadaceae	Gudmari	C	MD	L	Diabetes	VU
<i>Habenaria roxburghii</i> (Pers.) R.Br.	Orchidaceae	Malle Leena Gadda	H	MD	Tu	Snakebite	VU
<i>Heterostemma deccanense</i> (Talb.) Swarup & Mangaly	Asclepiadaceae	Pedda Joola pala	C	SEG	Sb	Stomachache	EN
<i>Hildegardia populifolia</i> (Roxb.) Schott. & Endl.	Sterculiaceae	Gali Budda	T	DD	Sb	Malaria	EN
<i>Hypericum gaitii</i> Haines <sup>a</sup>	Hypericaceae	---	S	MD	L	Skin eruption	---
<i>Lasia spinosa</i> L.	Lauraceae	Salava dumpa	H	SEG	Rh	Body pains	EN
<i>Litsea glutinosa</i> (Lour.) Robins	Lauraceae	Nara mamidi	T	SEG	Sb	Check muscular bleeding	CR
<i>Nervilia aragonana</i> Gaud.	Orchidaceae	Ventelu dumpa	H	SEG	L	Skin diseases	EN
<i>Paederia foetida</i> L.	Rubiaceae	Pasaruni	C	MD	L	Skin diseases	NT
<i>Pimpinella tirupatiensis</i> Balakr. & Subram. <sup>a</sup>	Apiaceae	Konda Kottimeera	T	MD	R	Scorpion sting	---

<i>Plumbago indica</i> L.	Plumbaginaceae	Rakta chitaparu	H	DD	Tu	Abortifacient	EN
<i>Premna calycina</i> Haines	Verbenaceae	Nalla Jitramu	T	MD	Sb	Stomachache	VU
<i>Pterocarpus santalinus</i> L.f. <sup>a</sup>	Papilionaceae	Erra chandanam	T	DD	Sb	Diabetes	---
<i>Rauvolfia serpentina</i> (L.) Benth ex Kurz.	Apocynaceae	Patalgaruda	H	MD	R	Snakebite	CR
<i>Rhynchosia beddomei</i> Baker <sup>a</sup>	Papilionaceae	Advi kandi	H	DD	L	Abortifacient	---
<i>Rubia cordifolia</i> L.	Rubiaceae	Khuamadu	H	MD	R	Stomachache	VU
<i>Santalum album</i> L.	Santalaceae	Sirigandhamu	T	DD	R	Skin diseases	NT
<i>Shorea tumbuggaia</i> Roxb. <sup>a</sup>	Dipterocarpaceae	Thamba Jalari	T	DD	L	Earache	---
<i>Stemona tuberosa</i> Lour.	Stemonaceae	Konda tamara	C	MD	Tu	Gynecological disorder	VU
<i>Syzigium alternifolium</i> (Wight.) Walp.	Myrtaceae	Mogi	T	DD	F	Diabetes	EN
<i>Tacca lentopetaloides</i> (L.) Kuntze	Taccaceae	Dhoi	H	DD	Tu	Body pains	NT
<i>Terminalia pallida</i> Brandis	Combretaceae	Tella Karakkaya	T	DD	F	Dysentery	EN
<i>Torenia indica</i> Saldanha	Scrophulariaceae	Chinna Mogakura	H	DD	L	Earache	VU
<i>Zanthoxylum rhesta</i> (Roxb.) DC.	Rutaceae	Racha	T	MD	F	Dysentery	EN
<i>Zingiber roseum</i> (Roxb.) Rosc.	Zingiberaceae	Rajula gadda	H	MD	Rh	Stimulant	EN

<sup>a</sup>= Endemic; \*T= Tree, S= Shrub, H= Herb, C= Climber; \*\*SEG= Semi evergreen, MD= Moist deciduous, DD= Dry deciduous; \*F= Flower, L= Leaf, R= Root, Rb= Root bark, S= Stem, Sb= Stem bark, Sd= Seed, Tu= Tuber, Rh= Rhizome, Re= Resin, Mc= Male cone; \*VU= Vulnerable, EN= Endangered, NT= Near threatened, CR= Critically endangered, DD= Data deficient; TS= Threat status (CAMP/IUCN)\*

to treat many ailments. Therefore, this study is important to preserve the knowledge of medicinal plants used by the people in the Eastern Ghats. Also, it is of significance to exploit novel pharmacological compounds from these plants for various treatments of diseases.

As per State CAMP reports and IUCN, all the species identified in the present study were endemic and/or threatened. Out of 42 plant species, 13 are of vulnerable and

endangered category followed by 6 endemic, 5 near threatened, 4 critically endangered and one is data deficient. Seventeen species are collected from both dry and moist deciduous forests, where as only 8 species are located from semi-evergreen forest. From the above study, it is clear that the tribal people living in the fringes of deciduous forests depend on medicinal resources for their treatment. So, these medicinal plant species are gradually

becoming extinct from this area due to over utilization, population explosion and for other anthropogenic reasons. Therefore, there is a need to conserve these threatened plants is of utmost importance. Domestication of wild medicinal plants should be undertaken, which will augment the income of the tribal people and in turn help in the conservation of the species. Successful implementation of alternative harvesting methods of wild medicinal plants should be encouraged in the tribal areas with involvement of different agencies such as state forest departments and non-governmental organizations (NGO), usually working closely with the local people. Encouragement of cultivation is likely to be useful, in order to take the pressure off wild stocks, thus helping conserve genetic diversity. This could be through the development of small nurseries at each *in-situ* site, so as to propagate the species and introduce them where populations are low. Though the conservation priority areas are geared towards the future, the forest departments should advocate an alternate system to approach the protected area management that would integrate biodiversity conservation with social development. Such an approach would entail an improved understanding of the local pattern of resource use. As a result, the contemplated conservation strategies would benefit the local population to enable security to their local livelihoods and the base of conservation.

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#### References

- Ahmedullah, M. and M.P. Nayar 1987. *Endemic Plants of the Indian Region (Peninsular India)*. Botanical Survey of India, Calcutta.
- Balaguru, B., S.J. Britto, N. Nagamurugan, D. Natarajan and S. Soosairaj 2006. Identifying conservation priority zones for effective management of tropical forests in Eastern Ghats of India. *Biodiver. Conserv.* **15**: 1529-1543.
- Champion, H.G. and S.K. Seth 1968. *A Revised Survey of Forest Types of India*. The Manager of Publications, New Delhi.
- Gamble, J.S. 1928. *Flora of the Presidency of Madras*. Adlard & Son Ltd., London.
- Jadhav, S.N., D.K. Ved, U. Ghate, K.N. Reddy and C.S. Reddy 2001. *Proceedings of the Conservation Assessment and Management Planning Workshop: Medicinal Plants of Andhra Pradesh*. EPTRI, Hyderabad.
- Jain, S.K. 1991. *Dictionary of Indian Folk Medicine and Ethnobotany*. Deep Publications, New Delhi.
- Jain, S.K. and R.R. Rao 1983. *An Assessment of Threatened Plants of India*. Botanical Survey of India, Calcutta.
- Leaman, D. 2005. International standard for sustainable wild collection of medicinal and aromatic plants (ISSC-MAP). *Medicinal Plant Conservation Newsletter* **11**: 4-5.
- Nayar, M.P. and A.R.K. Shastri 1987-1990. *Red Data Book of Indian Plants, Vol I-III*. Botanical Survey of India, Calcutta.
- Pullaiah, T. 1997. *Flora of Andhra Pradesh, Vol-III*. Scientific Publishers, Jodhpur.
- Pullaiah, T. and D.A. Moulali 1997. *Flora of Andhra Pradesh, Vol-II*. Scientific Publishers, Jodhpur.

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- Pullaiah, T. and E. Chennaiah 1997. *Flora of Andhra Pradesh, Vol-I*. Scientific Publishers, Jodhpur.
- Rawat, G.S. 1997. Conservation status of forests and wildlife in the Eastern Ghats, India. *Environ. Conservat.* **24**: 307-315.
- Reddy, C.S., M. Brahman and V.S. Raju 2006. Conservation prioritisation of endemic plants of Eastern Ghats, India. *J. Econ. Taxon. Bot.* **30**: 755-772.
- Saxena, H.O. and M. Brahman 1996. *The Flora of Orissa, Vol I-IV*. Orissa Forest Development Corporation Ltd., Bhubaneswar.