

RET MEDICINAL PLANT BIO-DIVERSITY OF TALAKONA HILLS OF ANDHRA PRADESH, INDIA

Ram Babu. M¹ and Basha. S.K.M.²

Abstract: India is rich in medicinal plants diversity having thousands of plants. Some of them are recognized and classified as RET medicinal plants depending on their “Threat Status”. RET medicinal plants are Rare, Endangered and Threatened forest species growing and multiplied naturally in restricted areas. These plant species play predominant role as folk remedies against many diseases. In the present study, 33 RET plant species were explored, identified and documented from Talakona Hills of Andhra Pradesh. The main aim of the study is to get the data which provide information of RET medicinal plant biodiversity. This data helps to design the sustainable and conservation measures.

Key words : Medicinal plants, RET Plants, Exploration, Talakona hills, Eastern Ghats.

I. INTRODUCTION

Plants are widely used as source in medical field for several thousand years according to Abu (2005). Traditional healers in India use 2,500 plants species while 100 species of plants are found to serve as regular source of medicines (Pei, 2001). According to World Health Organization (WHO), 80% of the people depend on traditional medicines for their primary health care needs all over the world. One fourth of medicinal drugs are based on plants and their derivatives in both underdeveloped and developing countries (Principe, 1991). About 10% of World’s vascular plant species representing 20,000 to 25,000 species are under severe threat of varying degrees according to IUCN on a global basis. The demands for various parts of the medicinal plants have been met by indiscriminate harvesting of natural flora. This result in severe loss to both generic and species diversity. This biodiversity loss has become a severe ecological problem (Soule, 1991).

RET plants are grown and multiplied naturally in restricted areas. Preliminary work on identifying RET medicinal plant biodiversity has been initiated in India. The massive conversion of forest land into human environments has threatened the existence of many species (Dasappa and Jagat, 1999). Medicinal plants categorized in to different RET species depending the degree of threat they are facing.

Andhra Pradesh is endowed with rich forest resources having variety of flora and fauna the Estimate of total number of medicinal plants of Andhra Pradesh is around 1800 species as per the data base maintained by FRLHT, Bangalore. Traditionally, the local tribes depend on the medicinal plants for treatment of common ailments and the Knowledge is transmitted from generation to generation through folklore. Due to ever-increasing biotic pressure, over exploitation and regeneration of timber, pulpwood, fuel wood and bamboo species, no special attention was paid to identify, preserve and

¹ Research Scholar. Dept. of Botany. Rayalaseema University. Kurnool. A.P. India.

² Dept. of Botany, Vikrama Simhapuri University P.G. Centre, Kavali - 524201. A.P. India.

popularize the medicinal plants. It is therefore, essential that a fillip be given preserve the medicinal plants in the natural forest Accordingly the state has declared a number of forest areas rich in flora and fauna including medicinal plants as Medicinal Plants Conservation Areas (MPCA). One such MPCA has been established at Talakona with an area of 250ha.

Tribals mostly live in the forest, hills, plateaus and naturally isolated regions. Tribal Medicine of Chittoor studied by Vedavathy et.al. (1997.) Different medicinal and domestic uses of endangered gigantic creeper of Fabaceae, *Entada pursaetha* DC, studied by Sai Vishnu Priya and Srinivasa Rao., (2008.) They reported the presence of 12 plants of *Entada* in Talakona and its nutritional, medicinal, economical and ecological values. Madhava Chetty et al. (2006) published some work on medicinal plants of Chittoor district. Ethanobotanical studies of Talakona by Basha et.al (2010) identifies 15 plant species of 15 genera belonging to 12 families are used to cure 15 types of diseases by tribes. The present study aims at documentation of RET Medicinal Plants from Talakona hills of Andhra Pradesh.

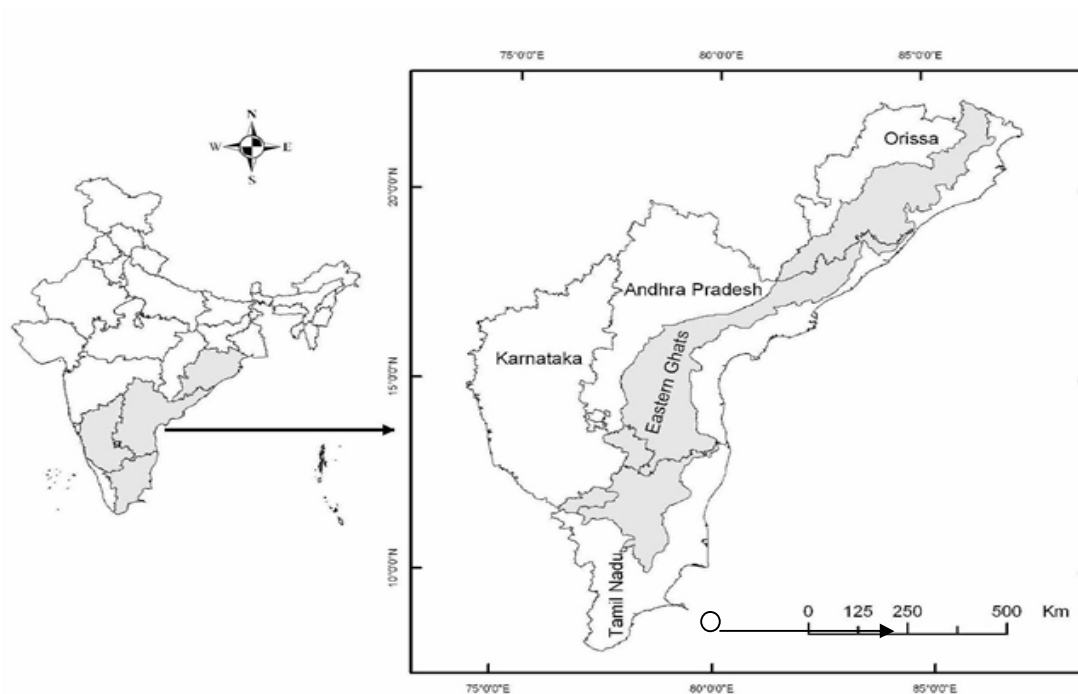
Research Highlights :

The main task in the development of conservation strategies of RET medicinal plants is to prepare an inventory of RET plants. Similar inventory is not prepared from Talakona hills of Andhra Pradesh. This paper attempts to fill the gap by documentation of RET medicinal plant species of Talakona. The present work high lights the identification of 33 RET medicinal plants out of which 18 rare plants, 10 endangered plants, 4 nearly threatened plants and one critically endangered plant from Talakona hills of Andhra Pradesh.

II. STUDY AREA

Sacred groves represent in-situ conservation of phytoresources. They also called as Pavitra-Vanalu according to WWF-AP, 1996. Chittoor represents second position with 102 sacred groves after Kurnool with 108 (Bhandary and Chandra Sekhar, 1997). Talakona sacred grove comprises dry deciduous to moist deciduous forests types with a number of useful and under-utilized plant taxa. The grove sustains a large number of plant species of timber, medicinal, aromatic, sacred and aesthetic values. *Enteda rheedei* - a large woody linear, spread over the entire forest and have ecological significance and economic importance. Recently, phyto-resources of Talakona have been over exploited for non wood forest products (NWFP) like fiber, dye, gum, resin, honey, fruits and nuts etc by local tribes. Deforestation and unsustainable extraction of fodder and firewood by the local people have further exerted pressure on the biomass.

Talakona hills are a sacred grove in Yerravaripalem Mandal of Chittoor District near Madanepalli. It lies at 79.8°E longitude and 13.43° N latitude and Altitude of 667 meters. Summer maximum temperature is 43°C and minimum 25°C, Winter Maximum temperature is 31°C and minimum is 16°C. Mean annual rain fall is 800-1000mm. It's geography well endowed with waterfalls, dense forests and wildlife. Telugu literal meaning of Talakona is head tail (Tala-Head and Kona – hill). Talakona represents “The head of the Seshachalam hills”. Talakona is floristically rich area where plants of various categories are growing spontaneously in their natural habitat. Talakona water fall is the highest water fall in Andhra Pradesh state with 270 feet (82m). It is situated in Sri Venketeswara National Park.



III. MATERIALS AND METHODS

Ethno botanical survey was carried out in Talakona during the year 2014-2015. The data was recorded in the field note book and later it was analyzed properly along with the experts. Plants were taxonomically analyzed with the help of the Floras (Gamble & Fischer, 1957, Ellis, 1987). The list of RET medicinal plants are given in alphabetical sequence with information including botanical name, vernacular name, family, habit and status of threat. Herbaria of specimens were preserved at Botany Laboratory of N.B.K.R. Degree college, Medicinal Plant Research Centre, Vidyanagar, Nellore District.

The RET medicinal plants of Talakona hills were assessed, classified and categorized after intensive field work and floristic studies. Categorizing the medicinal plants was carried out according to IUCN Red List Categories, IUCN version 3.1 (Mace & Stuart 1994). Further verification was carried out as per Jain and Rao (1983), Nayar et al. (1984), Ellis (1987), Nayar and Sastri (1988), Pullaiah and Yasoda (1989) and Venkata Raju and Pullaiah (1995). After thorough verification, Plants were categorized as rare (R), endangered (EN), critically endangered (CR) Nearly Threatened (NT).

IV. RESULTS AND DISCUSSION

Talakona is known for wide variety of Medicinal Plants that have been in existence, identified and utilized since hundreds of years by local tribes. The present work reveals the identification of 33 RET medicinal plants out of which 18 rare plants, 10 endangered plants, 4 nearly threatened plants and one critically endangered plant from Talakona hills of Eastern Ghats, Chittoor district of Andhra Pradesh. The RET medicinal plant species were enumerated according to alphabetical order of scientific name, local name, family, habit and IUCN status (Table: 1). Rare medicinal plants comprises 54.54% and they include *Alphonsea sclerocarpa*, *Casearia elliptica*, *Dendrobium ovatum*, *Elephantopus scaber*, *Ficus nervosa*, *Ficus tsjahela*, *Hibiscus platanifolius*, *Kydia calycina*, *Leucas lanata*, *Mallotus resinusus*, *Memecylon lushingtonii*, *Pamburus missionis*, *Plectranthus coesta*, *Soymida febrifuga*, *Stereospermum colais* var. *colais*, *Tyophora fasciculata*, *Uraria picta*, *Ximenia americana*. Endangered plants comprises 30.30% and they include *Acorus calamus*, *Butea monosperma*, *Cerapegia spiralis*, *Decalepis hamiltonii*, *Entada rheedii*, *Homalium zeylanicum*, *Rhynchosia heynei*, *Santalum album*, *Tephrosia calophylla*, *Vanilla wightian*. Nearly Threatened plants represent 12.12%

and include *Celastrus paniculatus*, *Costus speciosus*, *Holostemma ada-kodien*, *Pueraria tuberosa*. *Listea glutinosa* is the only Critically Endangered species and it represent 3.03% of total RET species.

33 Ret medicinal plant species represents 32 genera belong to 21 angiospermic families of which 16 of dicot and 5 of monocot families. *Ficus* genus comprises two species namely *nervosa* and *tsjahela* of Moraceae family. Two are of epiphytes like *Dendrobium* and *Vanilla* belong to Orchidaceae family. Graphical representation of RET plant species with different forms of Habit is represented in Fig; 1. 16 of them are trees, 5 are herbs and shrubs, climbers and stragglers represent 4 species each.

Graphical representation of the dominant families of RET plant species is represented in Fig:2. Fabaceae is the dominant family including 5 genera namely *Butea monosperma*, *Pueraria tuberosa*, *Tephrosia calophylla*, *Rhynchosia heyne* and *Uria pictata*. Asclepiaceae is the second dominant family with 3 genera namely *Cerepegia spiralis*, *Holostemma ada-lodein* and *Tylophora fasciculata*. 6 families like Flacourtiaceae, Lamiaceae, Malvaceae, Meliaceae, Moraceae, Orchidaceae include 2 species each. The remaining 13 families like Annonaceae, Araceae, Asteraceae, Celastraceae, Costaceae, Euphorbiaceae, Lauraceae, Lecythidaceae, Mimosaceae, Olaceae, Periploaceae, Rutaceae and Santalaceae include one species each.

TABLE – I: List of RET Plants of Talakona.

S.No.	Scientific Name	Local Name	Family	Habit	Status
1	<i>Acorus calamus L.</i>	Vasa	Araceae	H	EN
2	<i>Alphonsea sclerocarpa, Thw.</i>	Pulusumamidi	Annonaceae	T	R
3	<i>Butea monosperma (Lam.)</i>	Modhuga	Fabaceae	T	EN
4	<i>Casearia elliptica Willd.</i>	Chilakakaya	Flacourtiaceae	T	R
5	<i>Celastrus paniculatus Willd.</i>	Bavanji	Celastraceae	SG	NT
6	<i>Cerepegia spiralis Wt.</i>	Teega ganapa	Asclepiaceae	SG	EN
7	<i>Costus speciosus (Koen.)</i>	Vana vasa	Costaceae	H	NT
8	<i>Decalepis hamiltonii Wt. & Arn.</i>	Maredu kammullu	Periploaceae	SG	EN
9	<i>Dendrobium ovatum (Willd) Krantz</i>		Orchidaceae	H	R
10	<i>Elephantopus scaber L.</i>	Nelamarri	Asteraceae	H	R
11	<i>Entada rheedii Spr.</i>	Adavi chinta	Mimosaceae	SG	EN
12	<i>Ficus nervosa Heyne ex Roth Var. nervosa</i>	Vonjari	Moraceae	T	R
13	<i>Ficus tsjahela Burm.f.</i>	Pedda Juvvi	Moraceae	T	R
14	<i>Hibiscus plantanifolius (Willd.)</i>	Kondapathi	Malvaceae	T	R
15	<i>Holostemma ada-kodien Schult.</i>	Palajilledu	Asclepiaceae	C	NT
16	<i>Homalium zeylanicum (Gard.) Benth.</i>	Manthrala mukhi	Flacourtiaceae	T	EN
17	<i>Kydia calycina Roxb.</i>	Adavinara	Malvaceae	T	R
18	<i>Leucas lanata Benth.</i>		Lamiaceae	H	R
19	<i>Listea glutinosa</i>	Pulusumamidi	Lauraceae	T	CR
20	<i>Mellotus resinous (Blano.) Mcrr.</i>		Euphorbiaceae	T	R
21	<i>Memecylon lushingtonii Gamble</i>		Lecythidaceae	T	R
22	<i>Pamburus missionis (Wt.) Swingle.</i>	Adavi kitchili	Rutaceae	T	R
23	<i>Plectranthus coesta Buch. Ham. ex Don</i>		Lamiaceae	T	R
24	<i>Pueraria tuberosa (Roxb. Ex Willd.)</i>	Vidharikandha	Fabaceae	C	NT
25	<i>Rhynchosia heyne Wt. & Arn.</i>		Fabaceae	S	EN
26	<i>Santalum album L.</i>	Srigandhamu	Santalaceae	T	EN
27	<i>Soymida febrifuga (Roxb.) A. Juss.</i>	Somi	Meliaceae	T	R

28	<i>Sterospermum (Buch.Ham.ex.Dillw)</i>	Megavepa	Meliaceae	T	R
29	<i>Tephrosia calophylla Bedd.</i>	Adavi vempali	Fabaceae	S	En
30	<i>Tylophora fasciculata Buch-Ham.ex t.&Arn</i>		Asclepiaceae	S	R
31	<i>Uraria picta (Jacq.)Desv.</i>	Barresugundha	Fabaceae	S	R
32	<i>Vanilla wightiana Lindl.</i>	Naganalleru	Orchidaceae	C	EN
33	<i>Ximenia americana L.</i>	Konda Nakkera	Olacaceae	C	R

Abbreviations: C- Climbers, H- Herbs, S-Shrubs, T-Trees, SG=Stragglers, R= Rare, Ens=Endangered, CR=Critically Endangered, NT=Nearly Threatened.

TABLE – II.

HABIT	NUMBER OF SPECIES
TREES	16
HERBS	5
SHRUBS	4
CLIMBERS	4
STAGGLERS	4
TOTAL	33

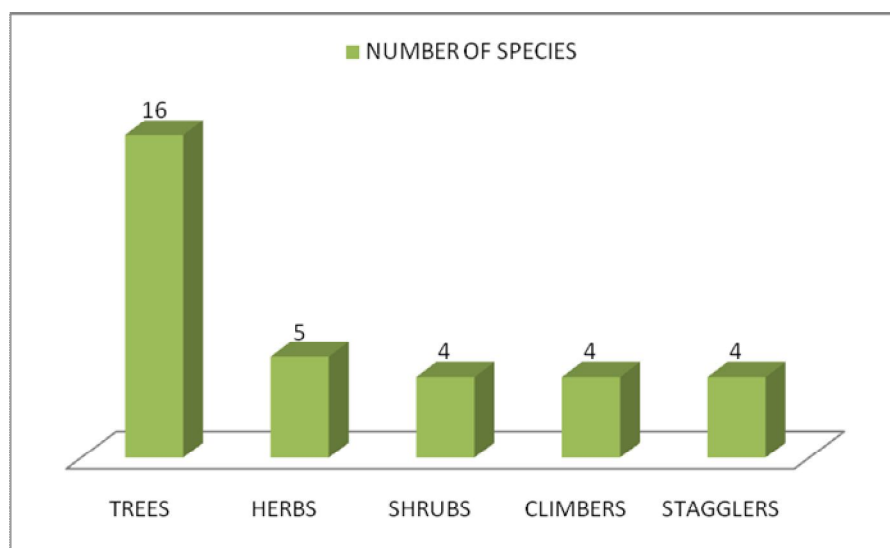


Fig-1 – Graphical representation of RET Plant Species with different forms of Habit.

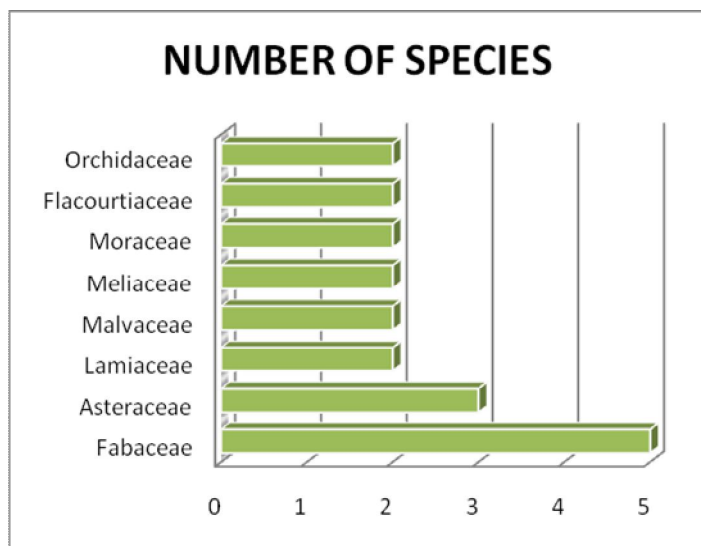


Fig-2 – Graphical representation of Dominant Families of RET Plant Species

LIMITATIONS OF THE RESEARCH

Present research is mainly concentrating on the identification and documentation of RET plants species of the study area. Population studies including species richness, species diversity, and conservation priority index have to be calculated. Distribution analysis of Ret plant species in different parts of study area also planned but not able to studied due to the shortage of time and so many other factors.

V. CONCLUSION

Talakona is one of the richest gene banks of medicinal plant resources in Andhra Pradesh. Tribes of Talakona have very good knowledge on the usage of medicinal plant resources for various purposes including medicines for various ailments. Harvest pressure on wild population of RET species has to be reduced by promoting viable commercial cultivation with the community. This work helps researchers to build on existing information and by avoiding repetition of research leading to conservation efforts on RET species including species recovery techniques. Proper management and conservation methods are not followed seriously, RET medicinal plants may be wiped out in near future from the forest.

Research Potential :

There is lot of research potential regarding to RET plants. Genetic mapping of RET plants has to be done for comparative analysis, molecular markers have to be prepared which are useful in the identification of RET plants of different regions of Eastern Ghats, It also allows the opportunity for the establishment of tissue, embryo and somatic cell banks of RET species. Studies of Seed Biology helps to propose holistic and multidisciplinary efforts for the conservation of RET plants species.

Justification of the Research :

Conservation of medicinal plants provides equal emphasis in the conservation of biodiversity and cultural diversity. This work is helpful for the people engaged in the conservation of biodiversity. It provides the scope for the study of reproduction biology of the RET plants which is helpful in their cultivation and conservation programmers.

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REFERENCES

- [1] Abu-Rubia A. *Urinary diseases and ethanobotany among pastoral nomads in the middle East. 2005* J Ethnobot. Ethnomed 1: 4.
- [2] Basha SKM., Rajyalakshmi E., *Ethanobotanical study of Talakona, Eastern Ghats, Journal of Tropical Forestry, Volume-27, April-June, 2011, No.II, Page No. 23-29.*
- [3] Bhandary M.J. and Chandrasekhar K.R. . *Sacred groves of Dakshina Kannada and Udipi districts of Karnataka. 2003* : Curr.Sci. 85 1655-1656.
- [4] Bowles I.A., Mittermeier R.A. *Logging and tropical forest conservation* 1998: Science, 280: 1899-1900.
- [5] Dasappa and Jagat R., *Conservation of Hot Spots of RET Species in Western Ghats 1999*: My forest 35(3):201-206.
- [6] Ellis, J.L. *Flora of Nallamalais* 1987: Vols I-II, BSI. Pub., Calcutta, India.
- [7] Gamble JS, Fischer CEC *Flora of the Presidency of Madras. Vol. I & III* (rep. ed. 1957) BSI, Calcutta, India.
- [8] Jain, S.K. and Rao, R. R *Threatened plants of India*, Proc. Seminar. Dehradun. 14-17 September 1981: B.S.I. Publications, Calcutta, India.
- [9] Mace G. M. & Stuart S. N. "Draft IUCN Red List Categories. Version 2.2" 1994: Species 21-22 : 13-24.
- [10] Madhava Chetty, K., K. sivaji, Sudarsanam, G. and Hindu Sekar. P . *Pharmaceutical studies and therapeutic uses of plumbago zeylanica L. roots (Chitraka, Chitramulamu) 2006*: Ethnobotanical Leaflets, southern Illinois University Carbondale.
- [11] Nayar M.P. & Sastry A.R.K. *Red Data Book of Indian Plants*. 1988: Vol. I and II. B.S.I. Pub., Calcutta, India.
- [12] Nayar, M.P.& Ahmed, M.P.M. & Raju, D.C.S. *Endemic and Rare Plants of Eastern Ghats 1984* B.S.I. Pub., Calcutta, India.
- [13] Pei S.J. *Ethanobotanical approaches of traditional medicine studies* 2001 : Some experiences from Asia Pharmaceut. Biol. 39: 74-79.
- [14] Principe P. *Monetising the Pharmaceutical benefits of plants* 1991. U S Environmental. Protection Agency. Washington. D.C.
- [15] Pullaiah. T & Yasoda. N. *Flora of Anantapur District, A.P., India* 1989 : Bishan Singh Mahendra Singh Publ. Dehradun, India.
- [16] Schultz, R.E *The role of the echnobotanist in the search of new medicinal plants* 1962 25:257-266.
- [17] Soule, M.E. *Conservation taffies for the constant crisis*. Science 1991: 744-750.