



## Original Research Article

# Ethnobotanical study of Penchalakona forest area of Nellore District, Andhra Pradesh, India

N. Savithamma<sup>1</sup>, M. Linga Rao<sup>1\*</sup>, P. Yugandhar<sup>1</sup> and R. Hari Babu<sup>1</sup>

\*Corresponding author:

M. Linga rao

<sup>1</sup>Department of Botany, Sri Venkateswara University, Tirupati, Andhra Pradesh-517502, India.

## Abstract

An ethno botanical survey was undertaken to collect information from yanadi tribe of penchalakona forest area, Rapur mandal, Nellore district, Andhra Pradesh, India. The indigenous knowledge of traditional healers of this ethnic group has been disappearing due to lack of ancestors as well as followers. Only few people are practicing with little knowledge which was transmitted orally from their elders. The native plants used for medicinal purposes by few people were collected through questionnaire and personally interviewed during field trips. An aboriginal tribe called "Yanadi", of this area has authentic information on medicinal values of different plant species. Yanadi tribal community being drifted from their natural way of life due to agro rural development activities, a few aged persons are still able to furnish very little traditional ethno botanical data and continue to depend on medicinal plants atleast for the treatment of primary healthcare. Because the area is located near the forest and 70 Kms from Nellore town. The study revealed that, the Yanadi tribe used 20 plants species belonging to 20 families to treat various diseases like worm infestations, scorpion sting, headache, body pains, fevers, swelling of foets, skin diseases, heart diseases, stomach ulcers, diuretic, dysentery, snake bites, nerve disorders, rheumatic pains, antiseptic, helmentic disease, diabetes, cold and dental problems. These plants represents the major source for the pharmaceutical industries in view of their raw material. The information requires validation for further clinical usage.

## Introduction

Ethno botany is a multidisciplinary science which is defined as the interaction between plants and people (Yogamaya *et al.*, 2011). India being a botanical garden of the world and a gold mine of well recorded and traditionally well practical knowledge of herbal medicine. The WHO has estimated that over 80% of the global populations rely chiefly on traditional medicine (Akerete, 1992). WHO encourages the traditional drugs because of its less side effects and most of the European countries expanding towards Ayurvedic medicines. Since ancient times, people have been exploring the nature particularly plants in search of new drugs (Savithamma *et al.*, 2011). Primitive societies have depended on herbal remedies for the treatment of diseases and disorders since time immorial (Singh *et al.*, 2003). There are considerable economic benefits in the development of indigenous medicines and in the use of medicinal plants for the treatment of various diseases (Azaizeh, 2003). Enhancing the sustainable use and conservation of indigenous knowledge of useful and medicinal plants may benefit and improve the living standards of poor people (Ripu and Rainer, 2008). Plants have been used in traditional medicine for several thousand years (Abu-Rabia, 2005). With the advent of

human civilization, many systems of therapy have been developed primarily based on plants. In India, drugs of herbal origin have been used in traditional systems of medicine such as Unani, Ayurveda, Siddha (Satyavathi, 1987). It was officially recognized that 2500 plant species have medicinal valued while over 6000 plants are estimated to be explored in traditional, folk and herbal medicine (Huxley, 1984) and 100 species of plants serves as regular sources of medicine (Pei Sj, 2001).

Due to less communication means, poverty, ignorance and unavailability of modern health facilities, most people especially rural people are still forced to practice traditional medicines for their common day ailments. Most of these people form the poorest link in the trade of medicinal plants (Khan, 2002). Now-a-days plant based drugs are widely used and many countries contributes 40-50% of their total health budget in the production of novel drugs (Sati, 2010). Still, one third of the modern pharmaceutical preparations have botanical origin. International trade on medicinal plants is therefore increasing rapidly mainly as result of intensified adoptions of crude extracts for self medication by the general public in the developed countries. In India, the use of plants for medicinal treatment dates back to 5000 years It is hoped that, in the future, ethno botany may play an increasingly important note in

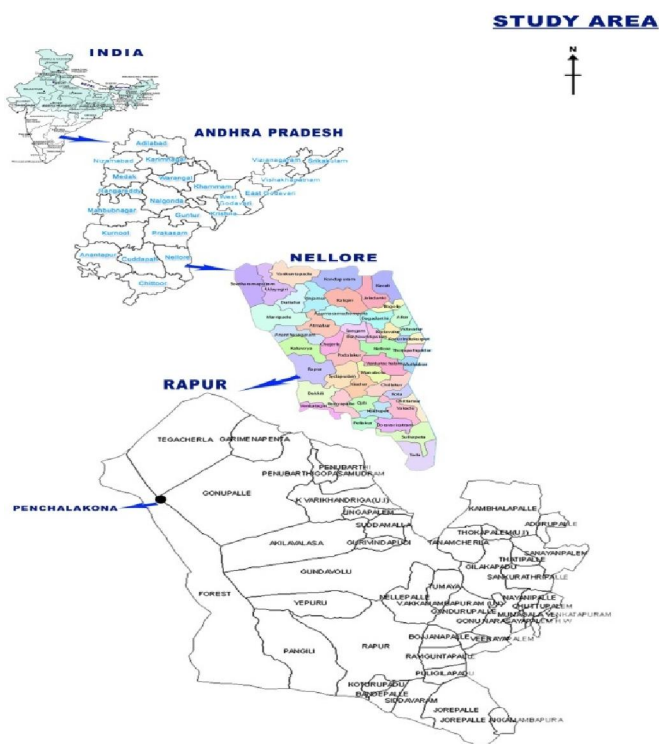


sustainable development and bio-diversity conservation (Rajasekharan and Warren, 1994). Documenting the indigenous knowledge through ethno botanical studies is important for the conservation and utilization of biological resources (Chellaiah, 2006). Ethno botanical investigation has led to the documentation of large number of wild plants used by tribal's for meeting their multifarious requirements (Anonymous, 1990).

Due to lack of interest among the younger generation as well as their tendency to migrate to cities for lucrative jobs, most of the traditional knowledge had faded away and there is a possibility of losing the existing knowledge totally in the near future. Hence an attempt has been made to document the available traditional knowledge with the yanadi ethnic group.

## The Study Area

Penchalakona hilly forest area which is a sacred grove is located in Rapur mandal of Nellore District, Andhra Pradesh, India. With the latitude of 14°18'N, longitude of 70°28", elevation above sea level 45" 3000 feet. It is 70 Kms from Nellore town. Penchalakona houses the temple of Sri Penusila Narasimha Swamy. Which is situated at the foot of the hill with a natural water fall and is believed that Kanvamaharshi did his penance here.



## Materials and Methods

Interviews were conducted in several field trips with tribal traditional healers having practical knowledge and experience to treat various diseases with locally available medicinal plants. Data presented here is based on personal observations and interviews with

traditional healers and methodology used based on the methods available in literature (Jain, 1989).

During the study-local name of the plant, parts used, mode of preparation and administration were recorded. The plant species were collected from the forest with the help of practitioners and identified using the Gamble volumes (1915-1936) and local floras as well as through comparison with identified specimens deposited in the herbarium of S.V.University. The gathered information was documented on data sheets and herbarium sheets are preserved in Dept. of Botany, S.V.U. College of Sciences, Tirupati.

## Results and Discussion

Plants claimed to have medicinal value for the treatment of various ailments are presented in Table No: 1. The scientific names of plants are arranged in alphabetical order with voucher specimen number, local name, family, plant part used, form of use and claimed therapeutic action.

The present work deals with 20 plant species, used traditionally by Yanadi tribes of Penchalakona hilly forest ranges for the treatment of various ailments. As per the habit, the plants used by Yanadi tribe is climbers (8 species) followed by herbs (6 species), trees (5 species) and shrubs (1 species) (fig.1). Different parts of medicinal plants are being to prepare medicines by the local traditional healers. Among them roots (40%) followed by leaves (35%), seeds (10%), stem bark (10%) and whole plant is (5%) (fig.2). Method of preparation of medicine involves juice (30%), Decoction (25%), Crushed form (15%), Powder (15%), Paste (15%) (fig.3). Some plants mentioned by them to treat various ailments are known to be used in preparation of popular Ayurvedic medicines in clinical settings and in local medicines (Savithamma et al., 2007). The medicine prepared by them with single plant or in combinations to treat snake bite and nervous disorders the medicine is preparing with combinations of two or more plants. Turmeric is one of the ingredients widely using in the preparation of local medicine. While treating the skin diseases the medicine is prepared with single plant like *E.monogynum* or with mixing the animal products. This type of treatment also finds with ethnic group of Kurnool district of Andhra Pradesh (Venkata subbaiah and Savithamma, 2012). Majority of plants mention by them are using to treat body and rheumatic pains. They collect the seeds, tuberous roots, stem bark and stored for 6 months. Whereas mostly the leaves are collected freshly. The medicinal use of plants for Yanadi tribe had not been documented until the performance of present study.

The active compounds like Acalyphin, Cyanogenic glucoside, Triacetoneamine, Acalyphus, Gammasitosterol acetate from *Acalypha indica*, Alangine A&B, Alangicine, Cephaline, Emetine, Lamarckimine, Salvifosides A-C from *Alangium salvifolium*, Andrographolide, Kalmeghin from *Andrographis paniculata*, Barberine, Protopine from *Argemone mexicana*, Aristolochic acid-I, Aristolochic acid-II from *Aristolochia bracteolata*, Shatavarin, Sarsasapogenin, Racemosol, Asparagamine, Shatavarin I-IV,

## DOCUMENTATION

S.NO.	Botanical Name, Voucher no., Local Name and Family	Disease & and Plant Part used	Preparation & Dosage
1.	<i>Acalypha indica</i> L. (SP 90) (Kuppentaku) Euphorbiaceae.	Worm infestations. (Leaf)	1-2 spoonful of leaf juice is taken 2 times per day get relief from intestinal worms.
		Scorpion sting. (Leaf)	10-20 gs of leaf paste with admixture of 1 piece of garlic and 4-5 gms of pepper powder is poultice on the stinging point.
2.	<i>Alangium salvifolium</i> Wang. (SP 190) (Oodaga) Alangiaceae.	Headache, Body pains. (Leaf)	10-15 ml of leaf juice was applied on forehead and painful parts of the body, continued for 3-5 days and get relief from headache and body pains.
3.	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees.in Wall. (SP30) (Nelavemu) Acanthaceae.	Fevers and swelling of foots. (Root)	5 gms of <i>A. paniculata</i> leaves with admixture of 5 gms equivalent weight of <i>Soemys fabrifuga</i> (Roxb.) A. Juss. stem bark, <i>Azadirachta indica</i> A. Juss. Stem bark and <i>Naringi crenulata</i> (Roxb.) Nicol., leaves. All the contents are ground to paste and filtrate to get juice. The juice was taken orally half cup per day, continued for 4-5 days to get relief from fevers and swelling of foot in case of newly delivered mothers.
4.	<i>Argemone mexicana</i> L. (SP 12) (Pichi kusumalu) Papaveraceae.	Skin diseases (Seed)	100 gs dried seed powder was taken and add few ml of Buffalo dung juice. The mixture was applied on diseased skin and exposed to sunlight for 1h at early mornings, continued for 4-5 days to get relief from skin diseases.
5.	<i>Aristolochia bracteolata</i> Lam. (SP 62) (Tella eswari) Aristolochiaceae.	Heart diseases and stomach ulcers (Root)	One cup full of root juice was taken orally at early morning, continued for 7 days to get relief from heart diseases and stomach ulcers.
6.	<i>Asparagus racemosus</i> Willd. (SP105) (Pilliteegalu) Liliaceae.	Diuretic and Dysentery (Root)	1-2 table spoon of root decoction was taken orally 2-3 times per day, continued for 4-5 days for free urination. It also gives relief from dysentery.
7.	<i>Borassus flabellifer</i> L. (SP 84) (Tati) Arecaceae.	Snake bites (Root)	5 gs <i>B. flabellifer</i> roots with admixture of 5 gs equivalent weight of <i>Tinospora cardifolia</i> (Willd.) leaves and <i>Phyllanthus reticulatus</i> Poir. Leaves squeezed to get juice and 5-6 spoons of juice was taken orally 2 times per day. <u>Precaution:</u> Avoid head bath and sleep for 24h while treatment.
8.	<i>Bytneria herbacea</i> Roxb. (SP 16) (Magaserigadda) Sterculiaceae.	Nerve disorders and stimulant in males (Root)	5 gs <i>B. herbacea</i> roots with admixture of equivalent weight of tuberous roots of <i>Maerua oblongifolia</i> (Forsk.) A. Rich., <i>Curculigo orchoides</i> Gaertn., <i>Withania somnifera</i> L., <i>Asparagus racemosus</i> Willd., Leaves of <i>Tinospora cardifolia</i> (Willd.) and Aril of <i>Myristica fragrans</i> Hatt., all are shade dried and powdered. Add 100

			ml of milk with one spoonful of dry powder with one spoonful honey. Taken every day, continued for 30 days.
9.	<i>Caesalpinia bonduc</i> (L.) Roxb. (SP 96) (Gachakaya) Caesalpinaceae.	Rheumatic pains (Seed)	The cotyledons of seeds are ground to paste, slightly warmed and applied on painful joints and rheumatic swellings for 30-40 days.
10.	<i>Cissampelos pariera</i> L. (SP 70) (Vishaboddi) Menispermaceae.	Antiseptic and diuretic (Leaf)	20 gs of leaves were boiled in glass of water with spoonful of turmeric powder. The paste is applied on wounds and cuts. The leaf juice (2 spoons) taken orally acts as diuretic.
11.	<i>Cissus quadrangularis</i> L. (SP 51) (Nalleru) Vitaceae.	Anti helmentic (Whole plant)	Fresh plant parts were crushed to get jelly like substance, 1-2 spoons are taken twice a day to get relief from intestinal worms.
12.	<i>Cleome gynandra</i> L. (SP 19) (Vamintaku) Cleomaceae.	Migraine headache (Leaf)	3-4 drops of leaf juice was poured into the ear were the Migraine headache is opposite to the ear.
13.	<i>Coccinia grandis</i> (L.) Voigh. (SP 38) (Donda teega) Cucurbitaceae.	Rheumatic pains (Tuberous root)	The root juice was extracted from <i>C. grandis</i> and add a pinch of dry powder of <i>Foeniculum vulgare</i> Mill. Mix well and applied on painful parts.
14.	<i>Cryptostegia grandiflora</i> R.Br. (SP 22) (Vishabuddi) Periplocaceae.	Snake bites (Root)	10 gs equivalent weight of roots of <i>C. grandiflora</i> and <i>Aristolochia indica</i> L. squeezed to get juice, 3-4 spoons juice was taken orally. <u>Precautions:</u> Avoid head bath and sleep for 24h while treatment.
15.	<i>Erythroxylum monogynum</i> Roxb. (SP 81) (Devadaru) Erythoxylaceae.	Skin diseases (Root and stem bark)	Thick juice was applied on affected skin.
		Worm infestations	5-10 ml of leaf juice was taken orally to get relief from intestinal worms.
16.	<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Schult. (SP 11) (Podapatri) Asclepiadaceae.	Diabetes (Leaves)	One spoonful of shade dried leaf powder was taken orally with glass of hot water.
17.	<i>Holarrhena pubescens</i> (Buch. – Ham.) Wall. ex G. Don. (SP 89) (Kolamukhi) Apocynaceae.	Nerve disorders (Stem bark)	One spoonful of shade dried stem bark powder was taken orally with glass of water daily.
18.	<i>Leucas aspera</i> (Willd.) Link. (SP 66) (Tummi) Lamiaceae.	Cold (Leaves)	2-3 drops of leaf juice dropped into nostrils to get relief from heavy cold.

19.	<i>Pergularia daemia</i> (Forsk.) chiov. (SP 58) (Dustapu teega) Asclepiadaceae.	Cold (Leaves)	10-20 ml of leaf juice with spoonful of turmeric powder taken orally with hot water.
20.	<i>Soymida febrifuga</i> (Roxb.) A.Juss. (SP 130) (Somichettu) Meliaceae.	Body pains and Dental problems (Stem bark)	A piece of stem bark was chewed for 3-4 days to get relief from body pains and dental problems.

Fig-1: Total Number of plant species

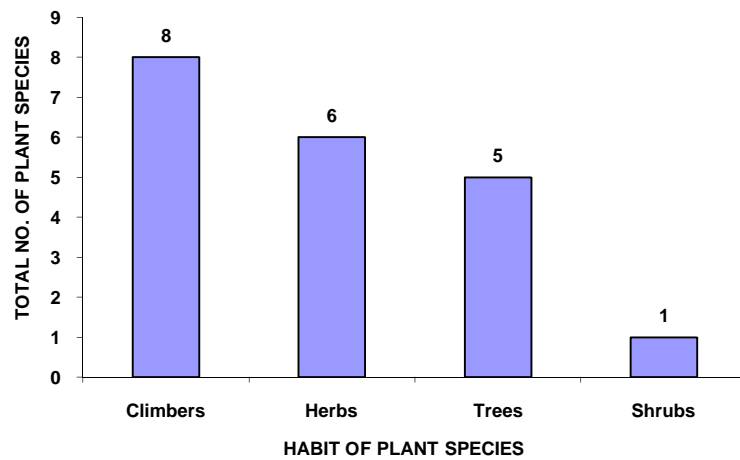


Fig-2: Percentage of plant parts used

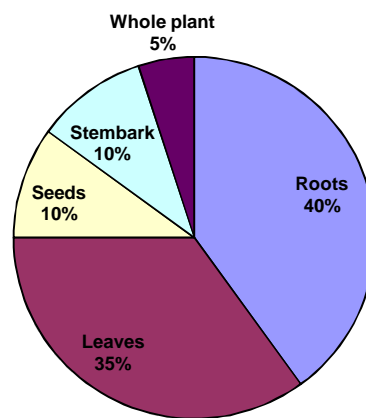
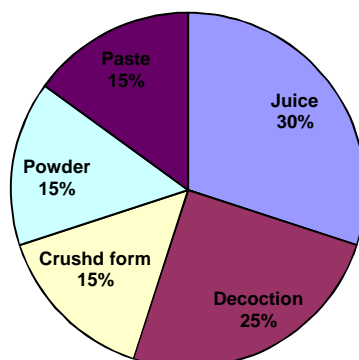


Fig-3: Percentage of drugs used



Quercetin, Rutin, Hyperoside, L-Disogenin from *Asparagus racemosus*, Steroidal saponin, Flabelliferin from *Borassus flabellifer*, Bonducin from *Caesalpinia bonduc*, Arachidic acid, Barbeerine, Berberine, Bulbocapmine, Cissamine, Cissampareine, R-Pelosin or Cissampeline, Al-Serperine from *Cissampelos pariera*, Ketosterones, n-Hexadecanoic acid, S-Carotene from *Cissus quadrangularis*, Gluco capparin from *Cleome gynandra*, Saponin Coccinioside-k(i), Flavonoid glucoside ambuin 3-0-arabino furanoside, 3-0-(-1-arabinopyranosyl-(1 2)-d-glucopyranosyl-(1 3)-hydroxylup-20(29)-en-28-oic acid, Lupeol, -amyirin and -sitosterol stigmast -7-en-3-one from *Coccinia grandis*, Lanosterol, -Sitosterol, Stigmasterol, Campesterol, Friedelin, Lupenol, Ursolic acid, -amyirin from *Cryptostegia grandiflora*, Conessine, Conessine dehydrate, Holarrhine, Kurchine, Konkurchine, Beta-sito sterol, lupeol, Alpha-amyirin from *Holarrhena pubescens*, Gymnemic acid from *Gymnema sylvestre*, Fatty acid esters, Fatty acid amide, Triterpene, Diterpene alcohols, Phytol form *Leucas aspera*, Kaempferol from *Pergularia daemia*, Tannic acid and Gallic acid from *Soymida febrifuga* are isolated from plant species used by Yanadi tribe.

## References

- [1]. Abu-Rabia A: Urinary diseases and ethnobotany among pastoral nomads in the Middle East. *Journal of Ethnobiology and Ethnomedicine* 2005, 1:4(<http://www.ethnobiomed.com/content/1/14>).
- [2]. Akerete, O. 1992. WHO guidelines for assessment of herbal medicines. *Fitoterapia* 63: 99-118.
- [3]. Anonymous, 1990. *Ethnobiology in India: A status Report*. Ministry of Environment and Forests, Govt. of India, New Delhi, 1-68 pp.
- [4]. Azaizeh H, Fulderson, Khalil K, Said O: Ethnomedicinal knowledge of local

## Conclusion

Information gathered from Penchalakona forest area indicates that the Yanadi tribe of this region possesses good knowledge of herbal drugs. The practitioners of Yanadi tribe possess unique knowledge of treating ailments when compared to other ethnic groups in the past. But it has been fading away due to lack of interest among younger generations to practice the traditional system of curing diseases with medicinal plants. Only a few are practicing the same. After a lot of trial and error based crude methods of studies, individual sufferings and sacrifices, they became perfect traditional practitioners. The medicines prepared by them are cost effective and easier to access to get from local tribes. Moreover, this remedy does not produce any side effects as per their claims but so far no validation was carried out. To test the scientific validity of the herbal preparations (or) drugs, clinical studies are required, which can establish therapeutic properties of these preparations for safe use.

## Acknowledgement

The Authors are highly grateful to the traditional practitioners of Yanadi tribes who share their knowledge for documentation of plants for treating different diseases and locating the plants in the field. Our thanks to DST for financial assistance and also for forest Department of Andhra Pradesh for permission to interact with Yanadi tribe.

- Arab practitioners in the Middle East Region. *Fitoterapia* 2003, 74: 98-108.
- [5]. Chellaiah Muthu, Muniappan Ayyanar, Nagappan Raja and Sararimuthu Ignacimuthu: Medicinal Plants used by traditional healers in Kancheepuram District of Tamil Nadu, India. *Journal of Ethnobiology and Ethnomedicine*, 2006, 2: 43.
- [6]. Gamble J.S., 1915-1936. *Flora of the Presidency of Madras*, Vol. 1-3. Authority of the Secretary of State for India in council, Dehra Dun, India, pp. 5-1597.
- [7]. Huxley, A. 1984. *Green inheritance: The World Wildlife Fund Book of India*, Collins/ Harvel, London.
- [8]. Jain, S.K., 1989 (ed.) *Methods and approaches in Ethnobotany*. Society of Ethnobotanists, Lucknow.
- [9]. Khan AV: History of decline and present status of natural tropical thorn forest in Punjab. *Pakistan Biological conservation* 2002, 63:210-250.
- [10]. Pei Sj: Ethnobotanical approaches of traditional medicine studies: Some experiences from Asia. *Pharmaceutical Biology* 2001, 39: 74-79.
- [11]. Rajasekaran, B and D.M. Warren 1994. Indigenous knowledge for socio-economic development and biodiversity conservation: the Kolli hills. *Indigenous knowledge and Development Monitor* 2: 13-17.
- [12]. Ripu M Kunwar and Rainer W Bussmann : Ethnobotany in the Nepal Himalaya. *Journal of Ethnobiology and Ethnomedicine* 2008, 4:24
- [13]. Sati SC, Sati N, Rawat U and Sati OP, Medicinal Plants as a source of antioxidants, *Res. J. Phytochems*, 4, 2010, 213-224.
- [14]. Satyavathi GV, Gupta AK and Tandom N, Medicinal Plants of India, Indian council of Medical Research, New Delhi, India, 1987.
- [15]. Savithamma N, Sulochana Ch, Rao K.N: Ethnobotanical survey of plants used to treat asthma in Andhra Pradesh, India. *Journal of Ethnopharmacology* 113(2007)54-61.
- [16]. Savithamma N, Linga Rao M, Suhulatha D. 2011. Screening of Medicinal plants for secondary metabolites. *Middle-East J. Sci. Res*:8, 579-584.
- [17]. Singh SP, Tripathi S and Shukla RS (2003). Ethnomedicinal heritage for Bio-prospecting and Drug development in North-Eastern States of India. *Journal of Economic and Taxonomic Botany* 26: 384-395.
- [18]. Venkata subbaiah K.P and Savithamma N: Bio-prospecting and documentation of traditional plants used to treat itching, psoriasis and wounds by ethnic groups of Kurmool district, Andhra Pradesh, India. *Asian journal of pharmaceutical and clinical research* vol 5, issue 2, 2012.
- [19]. Yogamaya Dhal, Rajani K Sahu and Bandita Deo: Ethnomedicinal survey of Koraput District, Odisha: An Update. *Journal of Pharmacy Research* 2011, 4 (11), 4142-4145.

