



Ethnomedicinal studies on plants used by Yanadi tribe of Chandragiri reserve forest area, Chittoor District, Andhra Pradesh, India

Nataru Savithamma, Pulicherla Yugandhar, Koya Siva Prasad, Sade Ankanna, Kummara Madhava Chetty

Department of Botany,
Sri Venkateswara
University, Tirupati,
Andhra Pradesh, India

Address for correspondence:
Pulicherla Yugandhar,
Department of Botany, Sri
Venkateswara University,
Tirupati - 517 502,
Andhra Pradesh, India.
E-mail: yugandharbotany@
gmail.com

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ABSTRACT

Aim: Ethnomedicinal studies on medicinal plants used by Yanadi tribe of Chandragiri reserve forest area are documented during the period of 2014-2015. The study is mainly focused on medicinal importance of plants used by Yanadi tribe to treat various ailments. **Materials and Methods:** The information collected on treated ailments, part used, preparation, combination, and addition of ingredients to prepare herbal medicines with the help of standard questionnaire. **Results:** During the study, 53 types of ailments were treated using 48 medicinal plants belongs to 26 families were documented. Among the medicinal plants, shrubs (15) were most using life form of plants for the preparation of herbal medicines. Leaf part (40%), paste form (33%), and oral administration (63%) of herbal medicines were most preferable. The documented ethnomedicinal importance of this tribe was cross-checked with Dr. Duke's Phytochemical and Ethnobotanical database shows most of the plants were correlated with this database. **Conclusion:** There is no record of traditional medicinal knowledge of these villages so far, hence the present study is aimed to document the information on medicinal plants used by Yanadi tribe in Chandragiri reserve forest area. The correlation of ethnomedicinal uses with Dr. Duke's Phytochemical and Ethnobotanical database clearly indicates the high medicinal significance of claimed data of this Yanadi tribe.

KEY WORDS: Ethnomedicinal studies, Yanadi tribe, Chandragiri reserve forest, Dr. Dukes ethnobotanical database

INTRODUCTION

Since time immemorial herbal systems of medicines are the major curatives in traditional system of medicine have been used in ancient medicinal practices. The importance of the traditional herbal medicinal system has gained vital importance in developed and developing countries [1]. These practices are continuing until today because of its biomedical benefits as well as its cultural belief in many parts of the world [2]. According to the World Health Organization about 80% of people in developing countries are still depending on traditional medicine and currently the demand is increasing eventually [3]. Medicinal plants are an important source of bioactive compounds and 25% of pharmaceutical prescriptions in the United States contain at least one plant-derived ingredient [4].

India is an oldest, the richest and most diverse cultural traditions associated with the use of medicinal plants in the form of traditional systems of medicine including Ayurveda, Homeopathy, Siddha and Unani [5]. India is a botanical garden of the world and a goldmine of well recorded and traditionally well-practiced knowledge of herbal medicine [6]. More than

6000 plants in India are use in traditional folk and herbal medicine representing about 75% of the medical needs of third world countries [7]. Indians rely chiefly in these systems of medicine and had been practiced for 5000 years. It is officially recognized that 2500 plant species have medicinal value while over 6000 plants are estimated to be explored in traditional, folk and herbal medicine. Presently, this plant based traditional medicinal systems continue to provide the primary health care to more than three-quarters of the world population [8].

Ethnobotany is the study of the interaction between plants and people with a particular emphasis on traditional tribal cultures [9]. Which play an important role on a collection of medicinal use of plants, based on the knowledge on plants by the local people and their usefulness by a particular ethnic group and information concerning particular plant varies from one ethnic group to another [10]. The use of medicinal herbs is still a tradition adopted by ethnic communities who are living in undulating plains and at the foothills of dense forest [11]. These types of ethnomedicinal studies play an important role for the conservation and documentation of sustainable use and importance of medicinal knowledge of

particular area/civilization [12]. Previously, ethnomedical studies or documentation of traditional knowledge of tribal people on medicinal plants from surrounding areas of Chittoor District was carried out by a number of ethnobotanists [13-18]. However, omitted the Chandragiri and Gopalapuram villages of Chandragiri reserve forest area. Because of its high altitudinal geography, strict tribal beliefs and lack of proper transport. In these villages, medicinal knowledge on herbal treatments is passed from generation to generation from their ancestors. Nowadays lack of interest among younger generations to carry out the same is due to attraction towards modern medicine. These two villages have a high abundance of flora and disappearance traditional healers dwindling rapidly. This is the reason behinds and the right time to document at least the remaining knowledge of this tribe. Hence, the present objective of this study is to document the medicinal knowledge of Yanadi tribe, explore and support their medicinal significance to compare their claims with Dr. Duke's phytochemical and ethnobotanical database.

MATERIALS AND METHODS

Study Area

The Chadragiri and Gopalapuram village forest areas are belonging to Chadragiri reserve forest area of Chandragiri mandal, Chittoor District, Andhra Pradesh, India with the geographical coordination's like 13° 33' 37.62" N, 79° 20' 51.87" E, 975 feet. elevation from sea level, having 31 ± 2°C day temperatures with 900 mm of average annual rainfall [Figure 1]. The protected area is proclaimed national land with distinct boundaries they are managed under the authority of Vana Samrakshana Samithi. This reserve forest area comes under the vegetation of dry deciduous forest having timber yielding, thorny, bushy trees along with herbaceous flora, covers 202 acres of land comes under Seshachalam hill region of Eastern Ghats.

Data Collection

To document the ethnomedical knowledge, the inhabitants belongs to the Yanadi tribe of Chandragiri reserve forest area is selected for documentation of their traditional knowledge on medicinal plants during the months of July to February of 2014-2015 period. The information obtained from traditional herbal healers like Muniah (60 Y), Subramanyam (44 Y), Nagaraju (56 Y) and Rajendra (40 Y), who are the people practicing traditional herbal treatments is interviewed and short discussion was made in their dialect. Chandragiri and Gopalapuram are medium sized tribal villages in the Chandragiri reserve forest area with the inhabitants of nearly 70 families and have a population of 190 people, of which 55 males, 69 females and 66 children's are residing. The families of these tribal peoples lived in thatched houses, thatched huts and as well as roofed houses. The tribal people in these villages depend mainly on agriculture, dairy and get wage from surrounding villages for doing labor works. A very little quantum of people practicing herbal treatments to cure their daily ailments mainly the knowledge gets from their ancestors. A structured questionnaire was used to elicit information from

them and methodology used based on the methods available in the literature [19]. During the study the information collected with the help of structured questionnaire with main headings like details of tribe, name of the disease, number of diseases cured, data on the plant, description of the drug, therapeutic indications, and reasons of the plant for considering as medicine were recorded along with many more sub headings [Figure 2].

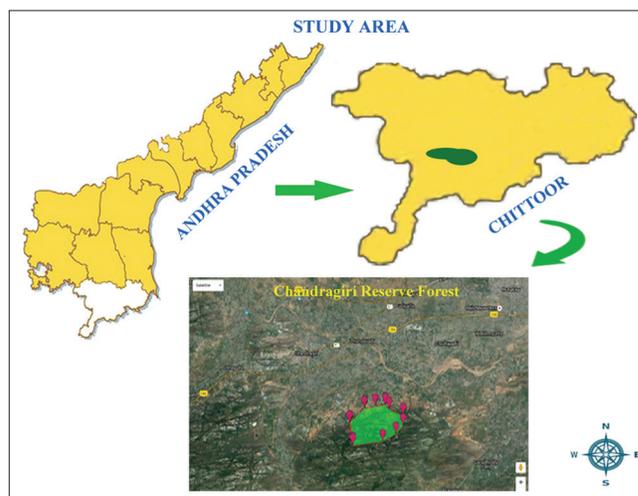


Figure 1: Study area

| PROFORMA FOR COLLECTING FIELD DATA ON MEDICINAL PLANTS | | | | | | |
|---|----------|-------|---|-------|--------------------------|-----|
| I. Tribe: | | | Name of the TMP | | | |
| Gender: Male/Female | | | Age: below 15/15-40/ 40 above | | | |
| Experience: below 5/15-10/10 above | | | Locality: | | Altitude: | |
| Knowledge gained from: | | | Knowledge transferred to: | | | |
| Occupation: | | | | | | |
| II. Name of the Diseases: | | | | | | |
| III. Number of diseases cured: | | | | | | |
| IV. Data on the plant: | | | | | | |
| a) Scientific Name: | | | b) Vernacular Name (s) (Specify the dialect): | | | |
| c) Family: | | | d) Habitat: H/S/C/T | | | |
| e) In case of Tree Species: Height and Girth and Bark nature | | | f) flower color: | | | |
| g) Fruit characteristics: | | | h) Small: | | i) Latex Present: Yes/No | |
| j) Collection and identified: | | | k) Photograph: | | l) availability: | |
| V. Description of the drug: | | | | | | |
| a) Time of the collection: Morning/Afternoon/Evening/Night | | | | | | |
| b) Method of preparation of the drug: (1) Natural form (2) Crushed (3) Juice (4) Decoction (5) Poultice (6) Soft paste (7) Solid preparation (8) Powder | | | | | | |
| i) Internal application (Chewing, Ingestion, Inhalation, Ticking) | | | | | | |
| ii) External application (Lotion, Bath Ointment, Poultice) | | | | | | |
| c) Ingredients used: single/mixed | | | | | | |
| d) Mode of administration: | | | | | | |
| e) Preservation of the drug: Y/N (Duration-----) | | | | | | |
| f) Plant part used as Medicine: (i) Root (ii) Stem (iii) Leaf (iv) Flower (v) Fruit (vi) Seed (vii) Root bark (viii) Stem bark (ix) Latex (x) Gum. | | | | | | |
| Percentage of the plant parts used for the preparation of drugs for 100 gr | | | | | | |
| V. Therapeutic indications: | | | | | | |
| a) Dosage | | | b) Person | | | |
| Content | Duration | | | Child | Adult | Old |
| | day | Month | Year | | | |
| c) Diet restrictions: Y/N | | | | | | |
| d) Patient Treatment With in the Tribal /other than Tribal | | | | | | |
| e) Side effects: Y/N/Unknown | | | | | | |
| VI. Reason of the plant for considering as medicine | | | | | | |
| a) Magico – religious belief b) traditional c) personal experience of healers | | | | | | |
| d) Strong belief on herbal drug e) Tales f) proverbs | | | | | | |
| g) Satisfaction level on particular drug: satisfied/ partially satisfied/ not satisfied | | | | | | |
| h) No. of persons treated: | | | | | | |
| i) No. of persons cured: | | | | | | |
| j) Other information: | | | | | | |

Figure 2: Proforma for collecting field data on medicinal plants

Identification of Plants

The collected plant species and claimed medicinal values of Yanadi tribe is cross checked with Gamble volumes [20], local floras as well as herbaria deposited in Dept. of Botany, Sri Venkateswara University, Tirupati. The information collected from healers is documented on data sheets and herbariums were prepared with a voucher specimen number, deposited in Sri Venkateswara University, Tirupati. The medicinal values claimed by these healers were cross checked with ethnomedicinal

data on medicinal plants from Dr. Duke's Phytochemical and Ethnobotanical database [21].

RESULTS

The study revealed that the Yanadi tribal practitioners were using 48 medicinal plants belonging to 26 families to treat 53 types of ailments [Table 1 and Figure 3]. The medicinal data collected and a brief discussion was made in their local language. The herbalists prepare most of their medicines in fresh

Table 1: Enumeration of ethnomedicinal data from Yandi tribe of Chandragiri reserve forest area

| Scientific, vernacular name and voucher specimen no. | Family | Life form and part used | Mode of preparation and administration | Uses |
|---|-----------------|-------------------------|--|--|
| <i>Abrus precatorius</i> L. (Guravindha) NP 117 | Fabaceae | Climber (S) | Powder (O) | 1-2 spoonful of powder with glass of hot water taken orally for 2 weeks to get relief from intestinal ulcers |
| <i>Abutilon indicum</i> (L.) Sweet. (Thutturubenda) NP 121 | Malvaceae | Herb (R) | Powder (O) | Spoonful of powder taken orally once per day to continue up to 1 month to act as energy stimulant |
| <i>Andrographis paniculata</i> (Burm. F.) (Nelavemu) NP 111 | Acanthaceae | Herb (W) | Juice (O) | 10-20 ml of juice taken two times per day, continue to 3 days for diabetes, malaria and fever |
| <i>Andrographis serpyllifolia</i> (Rottl. Ex Vahl) (Pamu nelavemu) NP 127 | Acanthaceae | Climber (RT) | Juice (O) | Spoonful juice with admixture of jaggery taken orally at early mornings up to 3 days to cure stomachache |
| <i>Asparagus racemosus</i> Willd. (Pilli teegalu) NP 149 | Liliaceae | Shrub (RT) | Powder (O) | A pinch of powder with sugar taken once per day and continue up to 3 months to delay aging |
| <i>Bauhinia racemosa</i> Lam. (Arichettu) NP 154 | Caesalpiniaceae | Tree (R) | Capsule (O) | Oral administration of two capsules per day, continue up to 3 days at the time of menstrual cycle to cure menstrual pains |
| <i>Caralluma attenuata</i> (Wt.) Grav. and Mayur. (Sanna Kundetikommulu) NP 181 | Asclepiadaceae | Herb (S) | Natural form (O) | Consumption of handful of stem cuttings to enhance the appetite |
| <i>Cassia auriculata</i> L. (Thangedu) NP 152 | Caesalpiniaceae | Shrub (F) | Paste (T) | Handful of flowers with pinch of turmeric powder, ground to prepare paste and applied externally 3 days to cure pimples and skin disorders |
| <i>Cassia hirsuta</i> L. (Pydee tanghadu) NP 167 | Caesalpiniaceae | Shrub (L) | Paste (T) | Topical poultice of paste form of leaf act as bone strengthener |
| <i>Cassytha filiformis</i> L. (Seethamma savaralu) NP 169 | Lauraceae | Climber (R) | Powder (O) | Daily intake of a pinch of powder with glass of hot water/milk to act as memory booster and reduce worm infestations |
| <i>Ceropegia juncea</i> Roxb. (Bellagadda) NP 183 | Asclepiadaceae | Climber (S) | Crushed form (O) | Daily intake of spoonful of crushed form of leaf acts as an alterative |
| <i>Cissus quadrangularis</i> L. (Nalleru) NP 145 | Vitaceae | Climber (R) | Powder (O) | Oral administration of 1-2 spoons of root powder with the admixtures of turmeric powder and gingelly oil once per day continue up to 7 days to cure jaundice and enhance the appetite |
| <i>Clerodendrum phlomidis</i> L.f (Takkili) NP 142 | Verbenaceae | Shrub (L) | Powder (O) | Oral administration of 1-2 spoons of leaf powder with glass of hot water two times per day up to 7 days to cure psoriasis and insect bites |
| <i>Croton bonplandianum</i> Baill. (Gali vana mokka) NP 129 | Euphorbiaceae | Herb (Fr) | Paste (O) | Licking of 50-100 g of fruit paste with admixture of jaggery twice per day up to 1 month to cure nervous disorders and mental illness Precaution: Avoid intake of curd at the time of treatment to mental illness |
| <i>Datura stramonium</i> L. (Ummetta) NP 120 | Solanaceae | Herb (Fr) | Paste (T) | External application of paste form of fruit to reduce foot palm and rheumatic pains |
| <i>Decalepis hamiltonii</i> Wt. and Arn. (Maredu kommulu) NP 161 | Asclepiadaceae | Liana (RT) | Powder (O) | 1-2 spoons of powder taken orally thrice per day up to 7 days to improve muscle contraction, delay ageing and for scorpion stinging/snake bites |
| <i>Dichrostachys cinera</i> (L.) (Veluthuru chettu) NP 174 | Mimosaceae | Tree (SB) | Juice (O) | Oral administration of diluted 10-20 ml of juice in glass of hot water given once per day to cure indigestion in children |
| <i>Digera arvensis</i> Forsk. (Chenchellaku) NP 187 | Amaranthaceae | Herb (L) | Paste (O) | Licking of paste form of leaf with admixture of jaggery to cure scorpion stinging and reduce digestive problems |
| <i>Diplocyclos palmatus</i> (L.) Jeffrey (Linga donda) NP 221 | Cucurbitaceae | Climber (L) | Capsule (O) | Daily intake of one capsule per day up to exoneration of ailments like asthma and gastric ulcers |
| <i>Dodonaea viscosa</i> (L.) Jacq. (Banderu) NP 247 | Sapindaceae | Shrub (L) | Capsule (O) | 100 g of tender leaves with the admixtures of cup of curd ground to made capsules and intake two per day with glass of hot milk to cure leucorrhoea and increases bone strength |
| <i>Euphorbia antiqorum</i> L. (Bontha jamudu) NP 257 | Euphorbiaceae | Shrub (F) | Latex (T) | External application of 10 ml of latex with pinch of turmeric powder twice per day continued up to 1-2 weeks for removal of warts |

(Contd...)

Table 1: (Continued)

| Scientific, vernacular name and voucher specimen no. | Family | Life from and part used | Mode of preparation and administration | Uses |
|---|----------------|-------------------------|--|---|
| <i>Flacourtia indica</i> (Burm. f.) Merr. (Pulleruka) NP 222 | Flacourtiaceae | Shrub (W) | Powder (O) | Daily licking of 2 spoons of powder with one spoon of honey acts as bone strengthener and enhance the appetite |
| <i>Glycyrrhiza glabra</i> L. (Atimaduram) NP 194 | Fabaceae | Herb (R) | Powder (O) | Daily intake of a spoonful of powder with glass of hot water to control diabetes and up to 2 weeks to reduce intestinal disorders like stomachache and indigestion |
| <i>Gmelina asiatica</i> L. (Adavi gummadi) NP 172 | Verbenaceae | Shrub (Fr) | Natural form (T) | Topical rubbing of fruit once per day up to 3-5 days to cure dandruff and reduce rheumatic pains |
| <i>Gynandropsis pentaphylla</i> DC. (Vominta) NP 126 | Capparidaceae | Herb (L) | Fumes (I) | Daily twice inhalation of leaf fumes up to 3-4 days to cure a migraine headache |
| <i>Hemidesmus indicus</i> (L.) R. Br. (Sugandapala) NP 131 | Asclepiadaceae | Climber (RT) | Powder (O) | Daily intake of 1-2 spoonful of powder with glass of water up to 1-2 months to acts as cooling agent, controls over sweating and acts as energy stimulant |
| <i>Hugonia mystax</i> L. (Kakibeera) NP 136 | Linaceae | Shrub (L) | Juice (O) | Oral administration of 4-6 drops of juice up to 7-15 days to cure mental disorders and scorpion stinging/snake bites |
| <i>Indigofera aspalathoides</i> Vahl. Ex DC. (Nela vempali) NP 197 | Fabaceae | Shrub (W) | Powder (O) | Daily intake of 1-2 spoonful of powder to reduce nerve disorders and brushing of mouth up to 3 days to cure toothache |
| <i>Jatropha gossypifolia</i> L. (Seemanepalamu) NP 248 | Euphorbiaceae | Shrub (RT) | Capsule (O) | Oral intake of 2 capsules per day up to 2-3 months to relief from skin cancers |
| <i>Justicia tranquebariensis</i> L.f. (Pindikonda) NP 175 | Acanthaceae | Shrub (L) | Paste (T) | External application of leaf paste with admixture of turmeric powder to get relief from rat bite and skin diseases |
| <i>Lawsonia inermis</i> L. (Gorinta) NP 173 | Lythraceae | Tree (L) | Paste (T) | External application of paste and take head bath twice per week to increase hair growth |
| <i>Maerua oblongifolia</i> (Forsk.) (Bhoochakra gadda) NP 186 | Capparidaceae | Climber (RT) | Natural form (O) | Daily intake of 100-150 g of root tuber with jaggery to acts as alterative and energy stimulant |
| <i>Malvastrum coromandelianum</i> (L.) NP 125 | Malvaceae | Shrub (L) | Paste (T) | 100 g of leaves with 10-15 g of turmeric powder is ground to prepare paste is applied externally for 3-4 days to cure any type of skin diseases |
| <i>Melhania incana</i> Heyne. (Choklamaram) NP 199 | Sterculiaceae | Herb (L) | Paste (T) | External application of leaf paste for 3-4 days to cure boils and burns |
| <i>Martynia annua</i> L. (Telikondikaya) NP 135 | Martyniaceae | Herb (L) | Crushed from (T) | External application/poultice of crushed form of leaf with admixture of pinch of lime stone to cure rheumatic pains, scorpion stinging and skin diseases |
| <i>Pachygone ovata</i> Miers. (Pedda dhusara teega) NP 182 | Menispermaceae | Climber (L) | Paste (T) | External application of leaf paste for 3-5 days to cure cuts and boils |
| <i>Pandanus fascicularis</i> Lam. (Mogali) NP 246 | Pandanaceae | Shrub (R) | Juice (O) | Daily intake of 2-3 drops of leaf juice to control diabetes, blood pressure and acts as astringent |
| <i>Pithecellobium dulce</i> (Roxb.) Benth. (Seemachintha) NP 202 | Mimosaceae | Tree (L) | Paste (O) | Daily licking of paste form of leaf with admixtures of honey and turmeric powder up to 4-7 days to cure fever and the paste prepared with admixtures of 5 year old children urine poultice to stomach to cure nerve disorders in the case of postpartum mothers |
| <i>Polygala arvensis</i> Willd. NP 128 | Polygalaceae | Herb (L) | Paste (T) | External application of paste form of leaf with admixtures of lime stone and turmeric powder for 3-5 days to cure pimples and skin diseases |
| <i>Sansevieria roxburghiana</i> Schult. and Schult.f. (Jaga) NP 143 | Vitaceae | Herb (L) | Juice (T) | Oral intake of 3-5 drops of leaf juice to reduce cold, cough and pouring into ear to cure earache |
| <i>Scutia myrtina</i> (Burm.f.) Kurz. (Budidhapallu) NP 184 | Rhamnaceae | Shrub (R) | Paste (T) | Licking of root paste with admixture of gingelly oil thrice per day up to 3 days to cure scorpion stinging/snake bites |
| <i>Sida acuta</i> Burm.f. (Medabirusaku) NP 245 | Malvaceae | Herb (L) | Paste (T) | External application of leaf paste prepared with the help of castor oil for 7-10 days cure psoriasis and rheumatic pains |
| <i>Strychnos nux-vomica</i> L. (Mushti) NP 165 | Strychnaceae | Tree (S) | Paste (T) | Oral intake of paste form of stem thrice per day up to 3 days to cure scorpion stinging/snake bites |
| <i>Syzygium cumini</i> (L.) Skeels. (Nerudu) NP 132 | Myrtaceae | Tree (SB) | Decoction (O) | Oral intake of 10-15 ml of decoction twice per day up to 3 days to cure diarrhea and gastric ulcers |
| <i>Tragia involucreta</i> L. (Nosintaku) NP 178 | Euphorbiaceae | Climber (L) | Capsule (O) | Oral intake of 2 capsules per day up to 3 days to get relief from scorpion stinging/snake bites and continued up to 5-6 days with a glass of milk and honey acts as aphrodisiac |
| <i>Tribulus subramanyamii</i> Singh et al. (Peddanugu palleru) NP 214 | Zygophyllaceae | Herb (Fr) | Powder (O) | Daily intake of pinch of powder with glass of hot water up to 10-15 days to reduce bladder stones |
| <i>Wattakaka volubilis</i> (L.f.) Stap f. (Kalisaku) NP 217 | Asclepiadaceae | Climber (L) | Paste (T) | 100 g of leaves with 10 g of camphor, 5 g of turmeric powder and ground to prepare paste, rubbed thrice per day up to 1 week to reduce rheumatic pains |
| <i>Ziziphus xylopyrus</i> (Retz.) Willd. (Gotti) NP 254 | Rhamnaceae | Tree (R) | Decoction (O) | Oral intake of 10-15 ml of root decoction prepared with admixtures of <i>Curcuma aromatica</i> tuber and <i>Piper longum</i> fruit powder for 3 days for snake bite Precaution: Avoid head bath and taken curd meals at the time of treatment |

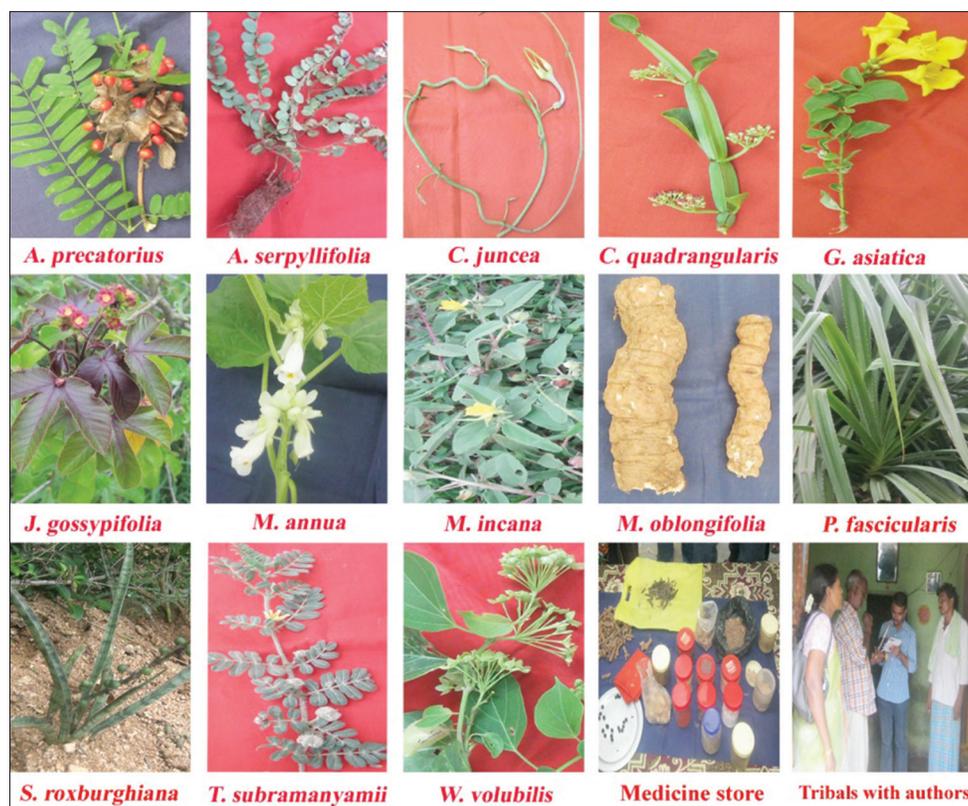


Figure 3: List of important medicinal plants used by Yanadi tribe of Chandragiri reserve forest area

form like juice, paste and some of the medicines were stored as capsules, decoctions, dried root bulbs, seeds and powders. Among the documented data most of the medicinal plants materialized from Asclepiadaceae by 05 species followed by Euphorbiaceae by 04 species, Acanthaceae, Caesalpiniaceae, Fabaceae, Malvaceae by 03 species and finally Capparidaceae, Mimosaceae, Rhamnaceae, Verbenaceae, Vitaceae by 02 species. While rest of the families represented only by 01 species each. The collected materials from medicinal plants, most of the herbal medications prepared from shrubs (15) followed by herbs (14), climbers (11), trees (07), and lianas (01) [Figure 4]. These medicines were prepared mostly from leaf (40%) part of the plant followed by root (17%), root tuber (12%), stem bark (13%), flower (8%), whole plant (6%), and fruit (4%) [Figure 5]. They commonly prepared herbal medicines in the form of a paste (33%) followed by powder (25%), juice (15%), capsule (10%), natural form (6%), crushed form (4%), decoction (4%), fumes (2%), and latex (2%) [Figure 6]. Tribal people of the Chandragiri reserve forest area preferred the administration of their herbal medicines through oral (58%) followed by topical (40%) and inhalation (02%) through the nostrils [Figure 7]. This documented ethnomedicinal data were cross-checked with Dr. Duke's phytochemical and ethnobotanical database, most of the plants, i.e., 30 are correlated out of 48 plants at least by one ethnomedicinal use.

DISCUSSION

Previously a number of ethnobotanists studied ethnomedicinal knowledge of the Yanadi tribe in different parts of Chittoor

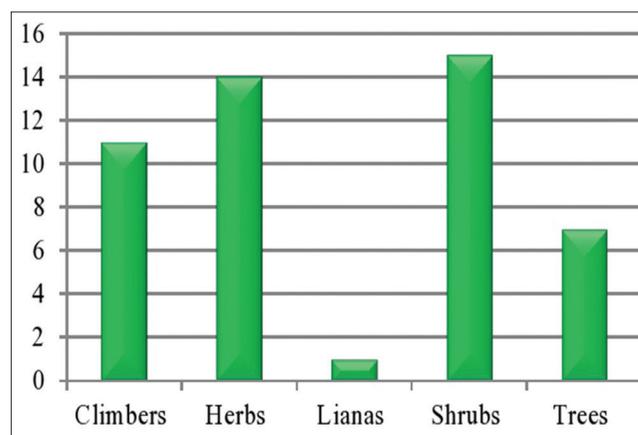


Figure 4: Life form of medicinal plants used for the preparation of herbal medicines by Yanadi tribe

District [22,23]. However, no more ethnomedicinal study is carried out in Chadragiri and Gopalapuram village areas of Chandragiri reserve forest area. The usage of medicinal plants from plant families like Asclepiadaceae is the most preferred by this tribe. Our findings regarding most utilization of this family are due to wide distribution of these family plants in the study area and known number of traditional uses. This type of wide documentation of Asclepiadaceae members was observed in Yanadi tribe of Kavali district [24]. Shrubs are most utilized plants in these areas for preparation of herbal formulations due to easily available and made easy for collection of these plants. This type of results was found in medicinal plants used by the

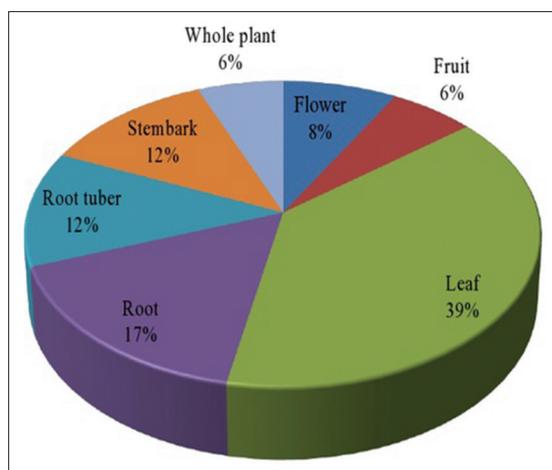


Figure 5: Percentage of plant parts used for preparation of herbal medicines by Yanadi tribe

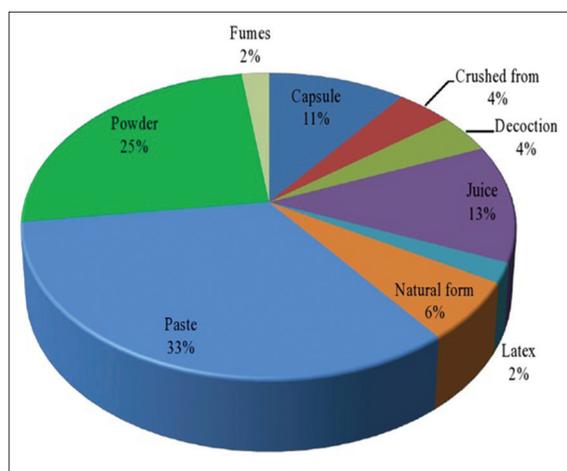


Figure 6: Percentage of different forms of medicines used for preparation of herbal medicines by Yanadi tribe

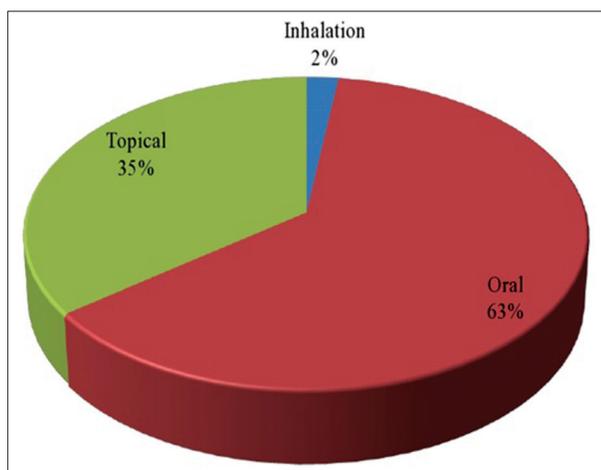


Figure 7: Percentage of administration of herbal medicines by Yanadi tribe

local people in Kailasakona sacred grove area of Chittoor District [18]. Leaf part of plants is most preferable for preparation of

herbal medicine in this areas. The common use of leaf in the preparation of remedies could partly due to the relative ease of finding of this plant part. The leaves remain green and available in plenty throughout the year. The same type of results was observed in Yanadi tribe and local villagers of Veyilingalakona sacred grove of Chittoor District [25]. The herbal preparation in the form paste and oral administration of medicine is the most preferable in these areas; it may due to most of the plant parts were brought fresh from nearby forests and taken orally may be due to the effective exoneration of ailments. This type of results was observed in the tribal people of East Godavri District [26] and Japali Hanuman Theertham sacred grove area of Chittoor District [27].

The way of disease treatment, formulation, combination, ingredients used and administration of herbal medicines in these areas claimed was entirely different from the previous studies. The use of hot water for oral administration of medicines prepared from *Abrus precatorius*, *Clerodendrum phlomidis*, *Dichrostachys cinerea*, *Glycyrrhiza glabra*, *Hemidesmus indicus* and *Tribulus subramanyamii*. Use of hot water is due to easy uptake for oral administration and it avoids any microbial organisms which contaminate the medicine. In the case of *Cassitha filiformis*, *Dodonaea viscosa*, *Tragia involucrata* milk is preferred. Milk is an excellent medium for oral administration of drugs and strengthens the patients as nutritionally. Admixtures of sweeteners like jaggery and sugar in the case of *Andrographis serpyllifolia*, *Asparagus racemosus*, *Croton bonplandianum*, *Digera arvensis*, and *Maerua oblongifolia*. These sweeteners avoid the bitterness of medicines and provide cumulative interest to patients to take medicines at regular intervals. An addition of spices like turmeric powder in the case of *Cassia auriculata*, *Cissus quadrangularis*, *Euphorbia antiqorum*, *Justicia tranquebariensis*, *Malvastrum coromandelianum*, *Pithecellobium dulce*, *Polygala arvensis* and *Wattakaka volubilis*. As the turmeric powder elevates the performance of actual drug and its acts as excellent antimicrobial agent on different disease causative microorganisms. Addition of lubricants like castor oil, gingelly oil and honey was in the case of *Sida acuta*, *C. quadrangularis*, *Scutia myrtina*, *Flacourtia indica*, *P. dulce*, and *T. involucrata*. These lubricants are helpful to patients taken oral medicines in an easiest way. Admixture of curd in the case of *D. viscosa*, limestone in the case of *Martynia annua*, *P. arvensis*, camphor in the case of *W. volubilis*, urine in the case of *P. dulce*. Admixtures like curd and limestone improves overall performance of actual medicine, camphor provides excellent relief from rheumatic pains. There is no scientific reason behind the amalgamation of urine in the case of *P. dulce*, only the people of these areas believes about to heal the disease. In the preparation of medicines they admixture, not only the ingredients, but also combination of medicinal plants were used to prepare medicines such as *Curcuma aromatica* and *Piper longum*. This type of utilization of the ingredients or combination of medicinal plants for the preparation of herbal formulations was recorded in Chenchu tribe of Mahabubnagar district [28]. This type of combination and admixture of ingredients is used in preparation of herbal medicines are recorded in our study area is very scant. This documented information is transferred from generations to generations,

especially to the elder son of their family. The younger generations are not interested to learn and practice this system of traditional medicine system. They are inconvenient with this system and desires immediate relief from their afflictions, due to this cumulative reduction of interest on herbal treatments, which become extinct nearby future.

The ethnomedicinal data of 48 medicinal plants enumerated from the Yanadi tribe of Chadragiri reserve forest area, among them medicinal uses of 30 plants are correlated to Dr. Duke's phytochemical and ethnobotanical database at least by one medicinal value. But the medicinal plants like *C. phlomidis*, *Gynandropsis pentaphylla*, *Pachygone ovata* and *S. myrtina* having medicinal value in the database but it's not correlated with this study. The medicinal plants like *A. serpyllifolia*, *Bauhinia racemosa*, *Caralluma attenuata*, *Cassia hirsuta*, *Ceropegia juncea*, *C. bonplandianum*, *Diplocyclos palmatus*, *M. oblongifolia*, *Melhania incana*, *Pandanus fascicularis*, *P. arvensis*, *Tribulus subramayamii*, *W. volubilis* and *Ziziphus xylopyrus* are not appearing at least by one ethnomedicinal use in the database. Based on this database, we concluded that the medicinal values claimed by the Yanadi tribe of Chadragiri reserve forest area are high significance towards curing of different ailments in a traditional way with their unique nature of selection and preparation of herbal medicines from medicinal plants.

CONCLUSION

The tribal people of Chadragiri reserve forest area have vast knowledge on medicinal values of plants in their surrounding forest. The study revealed that 48 medicinal plants belonging to 26 families are used to treat 53 types of ailments. The plant species belonging to Asclepiadaceae are most used for the preparation of herbal medicine and shrubs of life form, leaf part of plant, paste form of medicine, oral administration of medicines are most preferred characters of these study areas. Selection, preparation, addition of ingredients, and combination of medicinal plants for the preparation of herbal formulations is unique and no more documentation was made previously in these areas. Tribal people along with local people of surrounding villages attracted to this traditional medicine, because of its cost-effective and easy to get from local traditional healers. Most of the data claimed in these areas is only get from the above age of 40-60 years and the people of younger generations are not interested in practicing the same. Hence, this is the right time to document the disappearing ethnomedicinal uses of this tribe and to explore this data to globe. The claimed ethnomedicinal data of this tribe is correlated to Dr. Dukes phytochemical and ethnobotanical database concluded that high significance of this tribal claims. Novel information on the preparation of herbal medicines from medicinal plants in this study will be useful for future generations to discover novel drugs.

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