ISSN: 2377-6196
The American Journal of
SCIENCE AND MEDICAL RESEARCH, 1(1), 129-135

Research Article Open Access

Study on some medicinal plants used by the tribals of Khammam district, Telangana state, India

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Abstract

Background: Use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. This study was carried out in the different Mandals of Khammam district, Andhra Pradesh to document the traditional knowledge of local peoples on medicinal plants; and to investigate the distribution, abundance, taxonomic diversity and biological activity of medicinal plants.

Methodology: Field trips were conducted and ethnomedicinal data were collected through conversation with traditional healers', tribal doctors and elder people in the field trips.

During the interviews local names, useful plant parts, method of preparation and dosage were recorded. The voucher specimens were directly dried in the field using a conventional plant press. Herbarium Voucher specimens are deposited and plant species are enumerated by family followed by their tribal names and uses.

Results: In the present account, 44 species of angiosperms belonging to 27 families are reported. They are used as ethnomedicines for various severe diseases like jaundice, cancer, etc. by employing the preparations in the form of extracts, pastes, juices and powders. The data collected from the tribal people of Khammam district pertaining to the treatment of various ailments by Plant parts used for medicinal preparation were bark, roots, leaves, fruits, flowers, Stem, seeds and the whole plants. The most frequently utilized plant parts percentage were leaves (42.5%), followed by the roots (11.5%), seeds (4%), Stem bark (8%) fruits (8.5%), Stem (3.5%) flowers (8%), in the form of decoctions, extracts, paste, juices and powders.

Conclusion: The present investigation revealed that medicinal plants still play a vital role in the primary health care of the people and this study also generated a broad spectrum of information concerning medicinal plants used by tribal's

Keywords: Khammam, Telangana, Medicinal Plants, tribals

INTRODUCTION

Plants have been used both in the prevention and cure of various diseases of humans and their pets. With the advent of human civilization, many systems of therapy have been developed primarily based on plants. Ayurveda, Homeopathy, Sidda, Unani, etc. are our traditional systems of medicines. The plant-based traditional medical systems continue to provide the primary health care to more than three-quarters of the world's populace. The World Health Organization has estimated that over 80% of the global population relies chiefly on traditional medicine (Arshad and Akrams, 1999).

Indigenous herbal treatment is a part of the culture and dominant mode of therapy in most of the developing countries. These traditional phytoremedies, with a considerable extent of effectiveness, are socially accepted, economically viable and mostly are the only available means. Still, one-third of the modern pharmaceutical preparations have botanical origin.

How to Cite this Article:
Kavitha Burgula and Estari Mamidala (2015). Study on some medicinal plants used by the tribals of Khammam district, Telangana state, India. *The Ame J Sci & Med Res*, 1(1):129-135. doi:10.17812/ajsmr20151122.
Published online 29th June, 2015

International trade on medicinal plants is, therefore, increasing rapidly mainly as result of intensified adoption 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 was officially recognized that 2500 plant species have medicinal value while over 6000 plants are estimated to be explored in traditional, folk and herbal medicine (Brooks et al, 1991).

Use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance. (Diallo *et.al*.1999). The medicinal value of plants lies in some chemical substances that produce a definite physiological action on the human body. The most important of these bioactive compounds of plants are alkaloids, flavanoids, tannins and phenolic compounds. (Edeoga, H.O.*et al.* 2005)

Ratnam & Raju (2005) reported Folk medicine used for common women ailments by Adivasis in the Eastern Ghats of Andhra Pradesh. S.N. Jadhav & K.N. Reddy (2006) presented detail account on threatened medicinal plants of Andhra Pradesh. Bhakshu & Raju (2007) made abstract account on Ethno-medico-botanical studies of certain medicinal plants and certain Euphorbiaciaceous medicinal plants of Eastern Ghats, Andhra Pradesh. Geetha & Raju (2007) made a note on Ethno-medicobotanical properties of Terminaliaspecies in the forests of Eastern Ghats of Andhra Pradesh.

Jeric, *et.al,* (2007) reported the ethno botanical survey carried out on the territory of the highest mountain in Central Serbia, Kopaonik. In total, 83 wild species from 41 families and 96 preparations for use in human therapy were recorded. Most commonly used plants for medicinal purposes *are Hypericum perforatum* L., *Urtica dioica* L., *Achillea millefolium* L., *Matricaria chamomilla* L., *Sambucus nigra* L., and *Thymus serpyllum* L..

Unfortunately, such knowledge of tribals has only oral traditions without any written documents. Due to the changing life style of tribals and fast urbanization, the Ethnobotanical knowledge on useful plants acquired are accumulated through generations is gradually getting lost. Hence, documentation of the indigenous knowledge of wild plants has become imperative lest the vital clues they hold for the quality of life of the modern man would be lost forever.

The present-day traditional healers are very old. Due to lack of interest among the younger generation as well as their tendency to migrate to cities for lucrative jobs, wealth of knowledge in this the area is declining. So far no systematic ethnobotanical survey has been made in this area and this is the first report on the medicinal plants used by the local traditional healers. During the course of exploration of ethnomedicinal plants of the Khammam district, the information's have been gathered from the healers of rural villages found near forest areas where the people depend mostly on forests for their need and have sound knowledge of herbal remedies.

This study was carried out in the different Mandals (Chintoor, Chidumooru and V.R Puram) of Khammam district, Andhra Pradesh to document the traditional knowledge of local peoples on medicinal plants; and to investigate the distribution, abundance, taxonomic diversity and biological activity of medicinal plants. The medicinal plant lore and their distribution in the natural vegetation and home gardens and biological activity have as yet not been studied in the Khammam district, Andhra Pradesh. The aims of this study is to document the ethnomedicinal knowledge of traditional healers in Khammam District, Telengana State.

MATERIALS AND METHODS

Demography of Study Area:

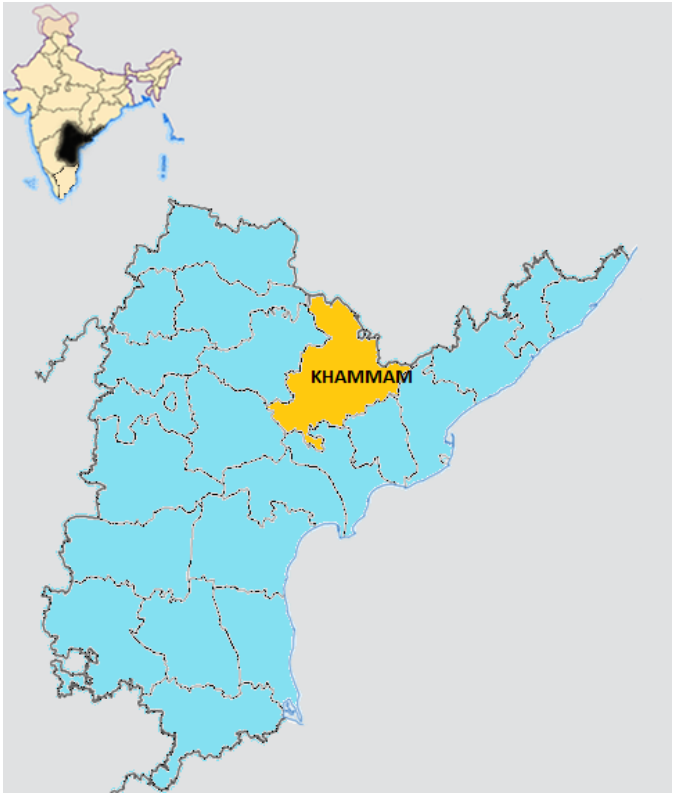
Khammam district is located in the south-eastern part of the Indian sub-continent and is an important district in the state of Telangana State. Khammam town is the district headquarters. The district is known for its ethnic life style. It can be said that Khammam district has a strong historical lineage and at the same time in the present day the district also continues with its process of advancement. The geographical location of the district is between 16.45 degrees and 18.35 degrees north latitude and 79.47 degrees and 80.47 degrees east longitude. It encompasses an area of 16,029 square kilometers. Khammam is bounded by the Krishna district in the north, East and West Godavari districts in the west, Nalgonda and Warangal districts in the west and the state of Chhattisgarh borders Khammam towards the north. River Godavari is the main river of the district

The Scheduled Castes and the Scheduled Tribes form a sizeable portion of the population in Khammam. There are around 3, 60,154 Scheduled Castes and 5, 58,958 Scheduled Tribes in the district. Only 20 percent of the population in Khammam lives in the urban areas. The main tribes which comprise a major portion of the population of Khammam district are the Koyas, Lambadas and Kondareddis. The tribal population in Khammam account for 13.29 percent of the total population.

The Koyas are the major traditional groups, distributed over a large part of the Khammam district. Their habitat extends from the Sileru river in the north to

the Sabari river in the west According to the reports of Tribal Cultural Research and Development (TCRT), a government agency, the Koyas of Bhadrachalam are generally, sturdly and medium in stature, with short flat nose, with spreading nostrils, thick and projecting lower lips and the complexion varies from light copper brown to dark chocolate colour. Their hair is usually wavy but almost straight. The Koyas speak very ancient type of speech, which is veryclose to Gondi and Telugu as well.

Figure-1. Map showing the location of study area



Ethnobotanical Survey

Field trips were conducted from October, 2011 through September, 2013 in tribal parts (Chintoor, Chidumooru and V.R Puram) of Khammam district, Andhra Pradesh (New State: Telangana), India. Ethnomedicinal data were collected through conversation with traditional healers', tribal doctors and elder people in the field trips. The field visit was conducted several times to the study area (during the study period).

During the interviews local names, useful plant parts, method of preparation and dosage were recorded (Figure-2). The specialists in traditional medicine were first asked about their healing experiences and about themselves. Next, during an excursion to the surroundings, the healer chose the plants he knew and was willing to show. On-site the specialist was interviewed about use (s), preparation, applications(s), plant name(s), as well as his healing concepts. Representative pictures of the plant were taken and herbarium specimens ere prepared. In addition information about illnesses and their causes were collected. The whole data were collected in an oral interview using the questionnaires.

Preparation of Herbarium Specimens

The method of collection of voucher specimens, preservation, herbaria and technique for the collection of Ethnomedicinal information's follows Jain (1977). The voucher specimens were directly dried in the field using a conventional plant press. A number tag was added to each specimen and it was placed on an open folder (wrapping-paper or newspaper) and sandwiched between pieces of newspaper and corrugated paper. The straps were fastened tightly and the press was hung up in the house to allow a steady flow of warm air and to avoid ants. The papers were changed regularly to keep the moisture content as low as possible (to avoid mould and decay) and to check for insect attack.

Herbarium Voucher specimens are deposited at Kakatiya University, Warangal, Telangana State, India. The plant species are enumerated by family followed by their tribal names and uses.

RESULTS AND DISCUSSION

Description of medicinal properties of plants used by traditional healers:

In the present account, 44 species of angiosperms belonging to 27 families are reported (Table 1). They are used as ethnomedicines for various severe diseases like jaundice, cancer, etc. by employing the preparations in the form of extracts, pastes, juices, powders, etc. Other common diseases and health complaints like Abortion, Anti inflammations, Asthma, Arthritis, Blood Pressure, Blood Bleeding, Cough, Diabetes, Dandruff, Diarrhea, Fertility improvement of male, Fever, Filaria, Hepatitis, Jaundice, Kidney disease, Ladies White Discharges, Muscular Pains, Pains, Paralysis, Ring Worm, Sugar, Scorpion Bite, Skin Allergy, Stomach Pain, Skin Diseases, STD's, Snake Bite, Tooth ache, Wound healing are cured by using of various plants found in the tribal healers of Khammam district .

The most dominant families of ethnobotanical importance are Fabaceae (4 species), Asclepiadaceae (4 species), Amaranthaceae (3 species), Asteraceae (3 species), Leguminoceae (3 species), Euphorbiaceae (2 species), Solanaceae (2 species), Phyllanthaceae (2 species), Lamiaceae (2 species), Simaroubaceae (1 species), Agavaceae (1 species), Aristolochiaceae (1 species), Meliaceae (1 species), Graminae (1 species), Rutaceae (1 species), Moraceae (1 species), Cucurbitaceae (1 species), Morigaceae (1 species), Bignoniaceae (1 species), Rosaceae (1 species), Combritaceae (1 species), Menispermaceae (1 species), Aizoaceae (1 species), Zygophyliaceae (1 species) and

Zingibaraceae (1 species). In the present study percentage of remedies using for different diseases as shown in figure 3.

Traditional healers of Khammam used 8 species to treat body pain relief, 6 species to treat skin diseases and other for different problems like jaundice, STDs, female genital problems , fever, poisonous bites , diabetes etc.

Table-1. Description of medicinal properties of plants used by traditional healers from rural areas of Khammam District, Telangana State, India.

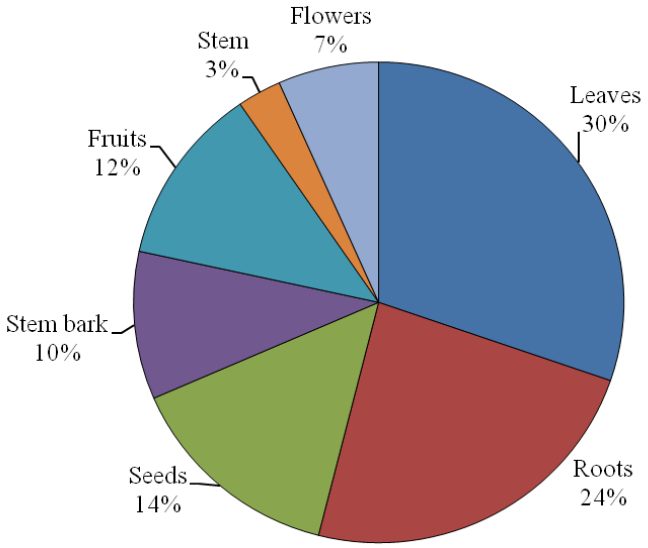
S. No	Botanical Name	Common Name	Family	Part Used	Medicinal Uses
01	*Abrus precatorius*	Gurijalu	Fabaceae	Seeds	Snake bite
02.	*Achalypa Indica*	Muripinda	Euphorbiaceae	Leaves	STDs, anti-diabetic & Jaundice
03.	*Achyranthes Aspera*	Uttareni	Amaranthaceae	Root	Tooth Ache
04.	*Ailanthus Excelsa*	Peddmamu Tree	Simaroubaceae	Root	Abscess
05.	*Aloe Barbadensis*	Aloe-Vera	Agavaceae	Stem	Skin Allergy & Ladies White Discharges
06.	*Alternanthera Sessilis* *Achyranthes Aspera*	Gungu Uttareni	Amaranthaceae Amaranthaceae	Root Root	Ladies White Dicharges
07.	*Aristolochia India*	Nalla Eswari	Aristolochiaceae	Root	Snake Bite
08.	*Azadirachta Indica*	Neem	Meliaceae	Leaves	Fever
09.	*Bambusa*	Veduru	Graminae	Leaves	Abortion
10.	*Butea Monosperma(L)*	Moduga	Fabaceae	Leaves	*Pain*
11.	*Calotropis Gigantea*	Jilledu	Asclepiadaceae	Flower	Cramps& Arthritis& Pains
12.	*Cassia Obtusifolia*	Thagerashe	Fabaceae	Leaves	Scorpion -Bite
13.	*Cassia Occidentalis (L.)*	Kassitha	Leguminaceae	Fruit	Sugar &Pains
14.	*Citrus Limon*	Limon Tree	Rutaceae	Fruit	Diarrhoea Dandruff, &Hair fall
15.	*Datura Metal(L)*	Erriummetta	Solanaceae	Leaves	Pains
16.	*Ecilptaalba*	Bhringraj	Asteraceae	Leaves	Blood Bleeding Skin Allergy, Hair fall, Dandruff
17.	*Ficus Religiosa*	Ravi	Moraceae	Stem bark	Hepatitis, anti-diabetic & STD's
18.	*Hemiessmus Indicus(L)*	Sugandi Pala	Asclepiadaceae	Roots	Tooth ache
19.	*Mimsa Puvica(L)*	Atti Patti	Leguminaceae	Leaves	Filaria, Blood Pressure
20.	*Momordica Charantia*	Bitter Gourd	Cucurbitaceae	Leaves	Jaundice& Diabetes,
21	*Moringa*	Munaga	Morigaceae	Root	Skin diseases
22.	*Ocimum Tenuiflorm (L)*	Tulasi	Lamiaceae	Leaves	Skin Allergy
23.	*Oroxylum Indicam*	Namale Tree	Bignoniaceae	Leaves	Pains
24.	*Pergularia Daemia*	Dustapu Teega	(Asclepiadaceae	Leaves	Fever
25.	*Phyllanthu Amarus*	Nalla Usiri	Phyllanthaceae	Fruit	Ring worm, Jaundice &Fever
26.	*Phyllanthus Emblica*	Usiri	Phyllanthaceae	Fruit	STD's, anti-diabetic & Skin diseases

27.	*Pongamia Pinnata*	Kanugatree	Fabaceae	Leaves	Blood Pressure Paralysis& Pains
28.	*Prunsdomesica*	Plum	Rosaceae	Leaves	LadiesWhite Discharges
29.	*Ricinus Communis (L.)*	Amudamu	Euphorbiaceae	Steem - Bark	Pains& Jaundice
30.	*Terminlia Chebula*	Myrobalan	Combretacece	Fruit	Cough &Diabetes,
31.	*Tinospora Cordfiolica*	Tippatheega	Menispermaceae	Leaves	STD's, Diabetes,& Sugar
32.	*Trianthema portulacastrum*	Thella galijeru	Aizoaceae	Stem-Bark	Kidney disease
33.	*Tribuluste restris*	Palleru	Zygophyliaceae	Leaves	Asthama
34.	*Trigonella foenumgraecum*	Menthulu	leguminoceae	Leaves	skin diseases
35.	*Trodax procumbens*	Nallaalam (Gaddichamanthi)	Astaraceae	Leaves	Wound healing
36.	*Tylophora Indica*	Kakapalla	Asclepiadaceae	Leaves	Anti-diabetic & Asthama
37.	*Vitex nigunda*	Vaavili	Lamiaceae	Leaves	Pains
38.	*Withania sominifera*	Ashwagandha	Solanaceae	Stem-bark	Fertility improvement of male
39.	*Zingibar officinale*	Sonti	Zingibaraeae	Root	Asthma ,Fever
40.	*Teprosia purpurea*	Vempali	Fabaceae	Whole plant	Urinary problems,diabetes
41	*Psidium guava*	Jama	Myrtaceae	Fruit	Mouth ulcers
42	*Mucuna prurita*	Duldumma (Duradagondi)	Fabaceae	Whole plant	Tooth ache
43	*Justicia adhatoda*	Addasaram (Ippatheega)	Acanthaceae	Stem and Leaves	Fever and cough
44	*Euphorbia antiquorum*	bramhajemudu	Euphorbiaceae	Leaves	Cancer & Diabetes

Plant Parts Used:

The plant material is employed in the form of decoctions, extracts, pastes, juice & Powder some times in combination with other parts of same or different plants other substances, such as sugar candy, curd, honey, hair oil, milk and turmeric powder, are also used in various preparations. The data collected from the tribal people of Khammam district pertaining to the treatment of various ailments by Plant parts used for medicinal preparation were bark, roots, leaves, fruits, flowers, Stem, seeds and the whole plants. The most frequently utilized plant parts percentage were leaves (42.5%), followed by the roots (11.5%), seeds (4%), Stem bark (8%) fruits (8.5%), Stem (3.5%) flowers (8%), in the form of decoctions, extracts, paste, juices and powders (Figure-2).

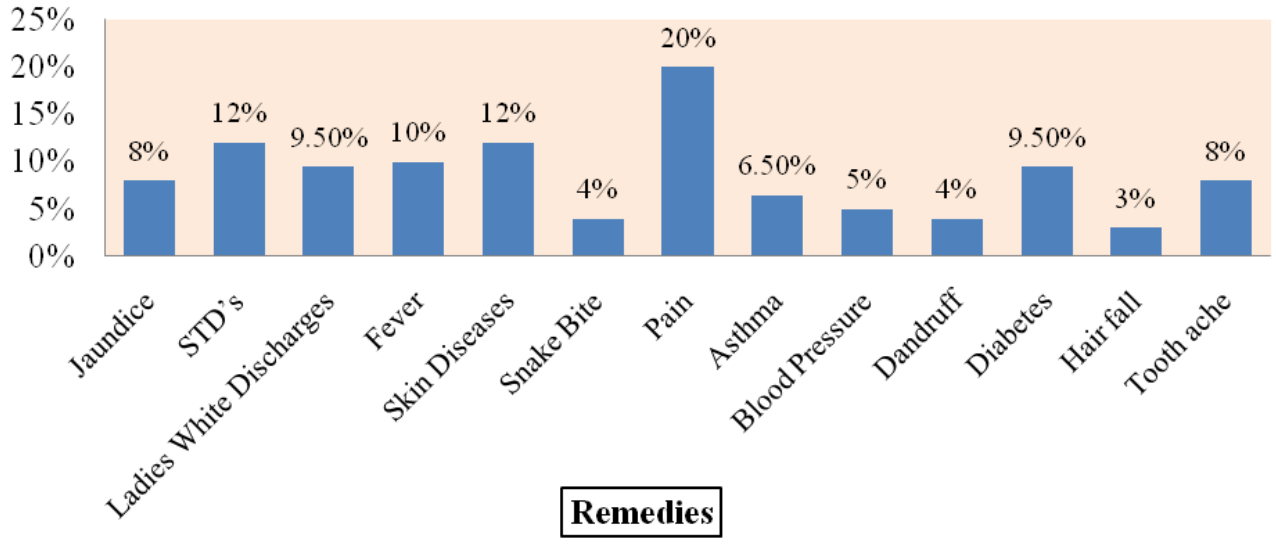
Figure-2: Plant parts used for medicinal purposes and percentage of total medicinal species



Remedies used for various diseases:

The medicinal plants based on their use in treatment of 30 different diseases were found to be very valuable such as Jaundice, asthma, diabetes, STD's, paralysis, snake bite, Fever . Among the different plant parts used for the preparation of medicine the leaves were the most important and frequently used and majority of the remedies reported in the present study are by administering the leaves orally (Figure 3).

Figure-3; Percentage of remedies used for various diseases



DISCUSSION

The study of Rajendra Prasad Gujjeti and Estari Mamidala (2012) revealed a rich diversity of medicinal plants used to treat various disease conditions in the villages around Khammam forest reserve. The families Euphorbiaceae, Apocynacae and Fabaceae which were the most dominant in this study are consistently recorded in other ethnomedicinal studies (Sharma et al, 1994 and Kapkoti, B., Lodhiyal, N., & Lodhiyal, L. S. 2014; Raju Porika and Mamidala Estari, 2015) and could be attributed to their wide range of bioactive ingredients. The fact that majority of the plant species recorded were sourced from the wild and only a few were cultivated may imply that many indigenous plant species may be difficult to propagate.

Most of people interviewed traditional healers were familiar with the species dealing with common ailments like cold, cough, fever, digestive problems, fever, headache, skin infection, and plant remedies were used on regular basis. Like other rural and tribal communities (Poojari, S., Porika, R., & Mamidala, E. 2014; Lev and Amar, 2000; Katewa et al., 2004; Ghorbani, 2005; Teklehaymanot et al., 2006; Pattanaik et al., 2008 and Vinatha Naini, Estari Mamidala, 2013), common knowledge was learned from the elders and community members who share knowledge of mode of collection, preparation and administration of medicinal plants to cure diseases. Earlier studies on traditional medicinal plants reveals that the economically backward local people of Kani tribals in Tirunelveli hills prefer folk medicine due to low cost and sometimes it is a part of their social life and culture (Census of India, 2005; Ramakrishna, N., and Ch Saidulu. 2014; Paindla, P., & Mamidala, E. 2014; Nigam. 2014 and Rajendra Chary Vijayagiri, Estari Mamidala 2012).

Present study revealed that the local traditional healers of Khammam district, Telangana State are rich in ethno-medicinal knowledge and majority of people rely on plant based remedies for common health problems like headache, body ache, constipation, indigestion, cold, fever, diarrhea, dysentery, boils, wounds, skin diseases, urinary troubles, fractures, round worms, etc. The survey also revealed that all the traditional healers have strong faith on ethnomedicines although they were less conscious about the documentation and preservation of ethno medicinal folklore and medicinal plants. The group discussion and personal interviews show that youngsters of forest areas belonging to tribal villages are less aware about the use of ethnomedicines.

The present study shows that the Khammam forest areas have great diversity of medicinal plants with rich ethnomedicinal uses, since this type of research must be promoted to understand the potential use of their plant resources, as well as a means to better promote basic healthcare.

The present investigation revealed that medicinal plants still play a vital role in the primary health care of the people. The information gathered from the tribal is useful for further researchers in the field of ethno-medico-botany, taxonomy and pharmacology. This study is based on the information provided by local tribal medicinal practitioner of Rural areas of Khammam district (Chintoor, Chidumooru and V.R Puram), Telangana State. This study offers a model for studying the relationship between plants and people, within the context of traditional medical system. The purpose of standardizing traditional remedies is obviously to ensure therapeutically efficacy. The value of using ethno medical information is to initiate drug discovery efforts. This study also generated a broad spectrum of information concerning medicinal plants used by tribal's. Due to lack of interest among the younger generation of

tribal's as well as their tendency to migrate to cities for lucrative jobs, we face the possibility of losing this wealth of knowledge in the near future.

Competing interests

The authors have declared that no competing interests exist.

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