

Ethno-Medico-Botanical Knowledge of Rural Folk in Anagodu Forest of Davangere District, South India

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Abstract: Now a day studies on herbal medicine is given top priority. People are slowly awakening about the dangerous side effects of the allopathic medicines and are turning towards the so called neglected "backyard plant" for curing many of their ailments. In this context, the preliminary study carried out in Anagodu forest located in Davangere district reveals that the people who are living in rural areas are still using these herbal drugs effectively against various ailments even in this time of sophisticated modern medicine. About six individuals are interviewed during the survey and a total of 70 plant species are used against different problems belonging to 25 families and 70 genera. The present work on wealth of ethno-medical-botanical knowledge of health care points has a great potential for future research, discovery of new effective drugs and for also the conservation aspects.

Keywords: Phyto-Ethno-Medicinal Knowledge, Folklore People, Anagodu forest region, Karnataka

1. Introduction

Ethnobotany is the study of plants in relation to the inhabitants of an area and deals with folk concept of classification by habit, habitat and usage or some other parameters (Berlin *et al.*, 2005). Ethnobotany studies by national and international organisation (WHO) have shown that for 75-90% of the world, the local herbalists alone attend to their medical problems. Some ethno-botanical studies have covered total relationship of the target human society with plants but they have been directed mainly to plant used in medicine and food (Morton, 1981; Jain, 1991). The art of herbal healing has very deep roots in Indian culture and folklore. Even today in most of the rural areas, people are depending on local traditional healing systems for their primary health care (Harsha *et al.*, 2003). About 80% of the world's population used plant materials as their source of primary health care as ethno-medicine (Farnsworth *et al.*, 1985; Kirtikar and Basu, 1996).

In India, it was reported that traditional healers use 2500 plant species and 100 species of plant serve as regular sources of medicine (Pei, 2001). Ethno-botanical knowledge has been documented from various parts of the Indian sub-continent (Das and Tag, 2006; Tribedi *et al.*, 1993; Prasad and Pandey, 1993; Udhyan *et al.*, 2005). Several medicinal herbs are flourishing in the state which has been in constant use by local inhabitants in serving to cure the ailments of livestock as ethnobotanical medicine (Bharati *et al.*, 2009; Balakrishnan *et al.*, 2009).

In Karnataka many tribal groups and rural districts has been studied to document the ethno-medicinal value of plants used by them (Bhandary *et al.*, 1995; Harsha *et al.*, 2002; Parinitha *et al.*, 2005; Rajakumar and Shivanna, 2010; Raju and Parashurama, 2014; Shivakumar and Parashurama, 2014). Our rural people have various knowledge about medicinal plants and their uses. Comprehensive detailed

information on ethnobotanical knowledge in Karnataka, which are lacking to certain areas (Bhandari *et al.*, 1995, Parinitha *et al.*, 2004, 2005) and particularly in Anagodu forest region of Davangere district of Karnataka. This district is having dry deciduous forest. It is having an area of 5913.4 km. The rural people of this area are making use of available biodiversity as medicine through local naati medical system to cure their ailments. The present paper deals with the commonly used various ailments are used in Anagodu forest region. This work would highlight the possibilities of drug development and scope for further detailed phytochemical or bioactive screening for the development of new therapeutic agents against various diseases.

2. Materials and Methods

To make study more comprehensive different peoples are interviewed residing around the Anagodu forest located in Davangere district. It has an area of 5913.4 sq km is situated between 13°.45" N latitude and 75°.3" E longitude (Fig.1). The information on the herbal medicine used against various diseases were collected through repeated interviews and discussions using questionnaire prepared according to the WHO- questionnaire model (Sinha, 1996) with the people who are practicing the local cure system and also the people who are using herbal products.

3. Results and Discussion

About 6 individuals are interviewed during the survey and a total of 70 plant species are used against different health problems belonging to 25 families and 70 genera were collected, identified and preserved for future studies. Plants were characterized based on identification keys given in standard identification manuals (Gamble, 1995; Manjunatha *et al.*, 2004), species are arranged by their botanical names, family name; local name and mode of usage are summarized in Table 1.

The dominant families used in the treatment of the ailments are as follows (Fig.2), Amaryllidaceae (16%), is the most used family in the treatment. Besides Piperaceae (15%), Acanthaceae and Liliaceae (13%), Rutaceae, Solanaceae and Fabaceae (10%), Poaceae (8%), and less used family is Apiaceae (5%). Among the parts used from the plant leaf is mostly used part (53%), apart from the root, seeds, fruit, latex are used in less amount (Fig.3). The most commonly used plant part to prepare the formulation is leaf (52%) followed by root (12%), latex (10%), seed and bark (8%) and fruit and bulb (5%). The use of plant part can also depend on its availability. The leaves and roots are always available

and most of the the healers prefer these parts in Kappathgudda region of Gadag district of Karnataka (Shivakumar and Parashurama, 2014). Similarly, the utilization of leaves and roots was maximum in the study area. The informant consensus in the usage of these medicinal herbs is providing an additional validity to this folk medicine. The wealth of ethno-medical-botanical knowledge of medicinal and other useful points has a great potential for future research, discovery of new drugs and for the conservation aspects.

Table 1: Medicinal plants used in the treatment of human diseases by folklore people in Anagou forest region of Davangere district, Karnataka

Sl.no	Ailments	Botanical name / Vernacular name	Family	Mode of use
1.	Ascariasis	<i>Butea monosperma</i> (L.) (Muttugada mara) (DU/BOT/AGA-VVP61)	Fabaceae	Two seeds of <i>B. monosperm</i> is powdered mixed with water, taken orally early in the morning, for three days.
2.	Blood dysentery	<i>Achyranthes aspera</i> (L.) (Uttarani gida) (DU/BOT/AGA-VVP59) <i>Cuminum cyminum</i> (L.) (jeerige) (DU/BOT/AGA-VVP64) <i>Cocos nucifera</i> (L.) (Tengina mara) (DU/BOT/AGA-VVP65)	Amaranthaceae Apiaceae Arecaceae	The roots of these three plants mixed and squeezed, taken orally during the meal.
3.	Blood pressure	<i>Allium sativum</i> (L.) (Bellolli) (DU/BOT/AGA-VVP28)	Amaryllidaceae	Two teaspoon of onion extract and is mixed with honey is added taken orally early in the morning, for a week.
4.	Body imbalance. Osteoarthritis	<i>Withania somnifera</i> (L.) (Ashwagandha) (DU/BOT/AGA-VVP29) <i>Asparagus racemosus</i> (Willb.) (DU/BOT/AGA-VVP30) (Shatavari)	Solanaceae Liliaceae	Roots of two plants are boiled in cow milk, taken orally early in the morning daily once for a week.
5.	Burning wound	<i>Cassia auriculata</i> (L.) (Honnarrike soppu) (DU/BOT/AGA-VVP46) <i>Tectona grandis</i> (L.) (Saagavani mara) (DU/BOT/AGA-VVP69)	Caesalpinaceae Verbenaceae	Leaves are fried on fire, and made into powder applied to affected part with coconut oil. The twig is squeezed and applied along with coconut oil.
6.	Chronic cough for adults	<i>Adhatoda vasica</i> (L.) (Adusoge) (DU/BOT/AGA-VVP31)	Acanthaceae	2 to 3 leaves are boiled in water with sugar and taken orally, early in the morning, for a week.
7.	Chicken fox	<i>Tamarindus indicus</i> (L.) (Hunase mara) (DU/BOT/AGA-VVP74)	Caesalpinaceae	The leaves of <i>T. indicus</i> are boiled in water and taken orally early in the morning for a week.
8.	Cough in children	<i>Ocimum sanctum</i> (L.) (Tulasi) (DU/BOT/AGA-VVP32) <i>Piper nigrum</i> (L.) (Kari menasu) (DU/BOT/AGA-VVP33) <i>Allium sativum</i> (L.) (Bellolli) (DU/BOT/AGA-VVP28)	Lamiaceae Piperaceae Amaryllidaceae	Leaves paste mixed with <i>P. nigrum</i> , <i>A. sativum</i> are boiled in water and taken for three days .
9.	Crack heels	<i>Biophytum sensitivum</i> (L.) (Ola muchugana soppu) (DU/BOT/AGA-VVP40) <i>Piper nigrum</i> (L.) (Kari menasu) (DU/BOT/AGA-VVP33) <i>Allium sativum</i> (L.) (Ballolli) (DU/BOT/AGA-VVP28)	Oxalidaceae Piperaceae Amaryllidaceae	Leaf extract, <i>P. nigrum</i> and <i>A. sativum</i> bulb made into a paste, applied to affected part, for three days.
10.	Diabetes	<i>Balanoites rouxburghii</i> (L.) (Ingalarada mara) (DU/BOT/AGA-VVP34) <i>Gymnema sylvestre</i> (Retz.) (Madhu nashini) (DU/BOT/AGA-VVP35) <i>Aegle marmelos</i> (L.) (Bilpatre gida) (DU/BOT/AGA-VVP36)	Simarobaceae Asclepidaceae Rutaceae	Leaf paste mixed with one spoon of honey taken orally early in the morning for one week. 2 to 3 leaves are taken orally early in the morning for one week. The fruit is taken after removing its seeds early in the morning.
11.	Dandruff	<i>Sapindus laurifolia</i> (L.) (Antavala) (DU/BOT/AGA-VVP37)	Sapindaceae	Fruits are squeezed in water and applied during bathing for one week.

12.	De-Alcoholism	<i>Adhatoda vasica</i> (L.) (Adu sogge gida.) (DU/BOT/AGA-VVP31)	Acanthaceae	The leaf juice is taken orally daily once for one week.
13.	Constipation	<i>Aloe barbadensis</i> (L.) (Lole sara) (DU/BOT/AGA-VVP38)	Liliaceae	Mucilage tissue is taken orally in the morning, for three days.
14.	Fever	<i>Adhatoda vasica</i> (L.) (Adu sogge soppu) (DU/BOT/AGA-VVP31) <i>Piper nigrum</i> (L.) (Karimenasu) (DU/BOT/AGA-VVP33) <i>Allium sativum</i> (L.) (Bellolli) (DU/BOT/AGA-VVP28)	Acanthaceae Piperaceae Amaryllidiaceae	Leaf paste is mixed with <i>P. nigrum</i> and <i>A. sativum</i> boiled in water and taken orally early in the morning for three days.
15.	Conjunctivitis	<i>Syzygium zeylanicum</i> (L.) (Bilihoovina gida/Panneralu). (DU/BOT/AGA-VVP55)	Myrtaceae	2 to 3 leaves are crushed and extracts put into eye drop wise, daily once for three days.
16.	Gastric	<i>Dalbergia lanceolata</i> (L.) (Bili Beete). (DU/BOT/AGA VVP39)	Fabaceae	Two to three leaves taken orally early in the morning.
17.	Infertility in women	<i>Barleria prionitis</i> (L.) (Gotali gida) (DU/BOT/AGA-VVP66) <i>Solanum americanum</i> (Miller) (Kaki gida) (DU/BOT/AGA-VVP67)	Acanthaceae Solanaceae	The leaf extract of <i>B. prionitis</i> , <i>S. americanum</i> plants are mixed, taken orally early in the morning, once in a month for three months.
18.	Indigestion	<i>Tinospora cardifolia</i> (Willd.) (Amruta balli) (DU/BOT/AGA-VVP41)	Menispermaceae	The basal stem part taken orally for three days.
19.	Jaundice	<i>Azadiracta indica</i> (Roxb.) (Bevina mara) (DU/BOT/AGA-VVP42) <i>Lawsonia innermis</i> (L.) (Madarngi gida) (DU/BOT/AGA-VVP68) <i>Cynodon dactylon</i> (L.) (Garike hullu) (DU/BOT/AGA-VVP69)	Meliaceae Lythaceae Poaceae	Two teaspoon of leaf extract along with the honey taken orally early in the morning for a week. The leaves of <i>L. innermis</i> , <i>C. dactylon</i> are crushed along with the cow milk, and taken orally early in the morning and applied to whole body, after 3-4 hours bathing has to be done.
20.	Leg swelling (Lymphedema)	<i>Cissus quadrangularis</i> (L.) (Mungura balli) (DU/BOT/AGA-VVP43)	Vitaceae	Latex obtained from breaking of stem is applied to affected part, for three days.
21.	Menstruation problem	<i>Securinega virosa</i> (Willd.) (Bilihuli soppu) (DU/BOT/AGA-VVP44) <i>Azima tetrcantha</i> (Lam.) (Asipakale gida) (DU/BOT/AGA-VVP45) <i>Cassia auriculata</i> (L.) (Tengati gida). (DU/BOT/AGA-VVP46)	Euphorbiaceae Salvadoraceae Caesalpiniaceae	Leafy twig extract from these three plants is taken orally just before periods time once for three months.
22.	Mother milk allergy to child	<i>Asparagus racemosus</i> (Willb.) (Shatavari gida) (DU/BOT/AGA-VVP30)	Lilliaceae	The root of asparagus is boiled in cow milk with sugar and given to child for three days.
23.	Migraine	<i>Holoptelia integrifolia</i> (Roxb.) (Tapasi mara) (DU/BOT/AGA-VVP47)	Ulmaceae	The bark will be inhaled/ smelled alternatively. If right side head ache, it is applied to left nose, inhalation of bark should be done vice versa.
24.	Neck swelling	<i>Leucas aspera</i> (Willb.) (Tumbe gida) (DU/BOT/AGA-VVP48)	Labiatae	Leaf extract, lime and jaggery mixed well and applied to affected area, for one week.
25.	Piles	<i>Mimosa pudica</i> L. (ola mucchaka). (DU/BOT/AGA-VVP49) <i>Abrus precatorius</i> (L.) (Kari gulaganji). (DU/BOT/AGA-VVP50)	Fabaceae Fabaceae	Leaf extracts of <i>M. pudica</i> crushed seeds of <i>A. precatorius</i> mixed and applied to affected part for one month.
26.	painful urination	<i>Aloe barbedensis</i> (L.) (Lole sara) (DU/BOT/AGA-VVP38)	Caesalpiniaceae	Mucilage tissue is taken orally early in the morning, for three days.
27.	poly urination	<i>Tribulus terrestris</i> (L.) (Ane naggali mullina gida) (DU/BOT/AGA-VVP51)	Zygophyllaceae	Spines of the plant soaked in water for few hour and taken orally early in the morning, for three days.
28.	Pitta	<i>Limonia acidissima</i> (L.) (Bellada hannu) (DU/BOT/AGA-VVP52) <i>Saccharum officinarum</i> (L.) (Kabbu) (DU/BOT/AGA-VVP54)	Rutaceae Poaceae	The ripened seed free fruit mixed with jaggery and taken orally.
29.	Paralysis	<i>Allium sativum</i> (L.) (Ballolli) (DU/BOT/AGA-VVP28) <i>Terminalia bellirica</i> (Roxb.) (tare mara) (DU/BOT/AGA-VVP64) <i>Citrus limon</i> (L.) (Nimbe) <i>Piper beetle</i> (L.) (veelyada yele) (DU/BOT/AGA-VVP65)	Amaryllidiaceae Combretaceae Rutaceae Piperaceae	2-3 pieces of garlic bulb are boiled in cow milk and taken orally, once in night, for a week. Bark of <i>T. bellirica</i> made pasted with limon, and it is taken in <i>P. beetle</i> orally for a week.
30.	Induce vomiting	<i>Adhatoda vesica</i> (L.) (Adu sogge gida.) (DU/BOT/AGA-VVP30)	Acanthaceae	The leaf juice is taken orally.
31.	Severe stomach	<i>Cassia auriculata</i> (L.) (Tengati gida)	Caesalpiniaceae	Bark of the plant kept in water for few

	pain/ Red menstrual problem	(DU/BOT/AGA-VVP46)		hours , water which contain dry bark extract is taken, has to be drink once in a month just before the periods, for three months.
32.	Scorpion sting	<i>Achyranthus aspera</i> (L.) (Uttarani gida). (DU/BOT/AGA-VVP57) <i>Saccharum officinarum</i> (L.) (Kabbu) (DU/BOT/AGA-VVP54)	Amaranthaceae Poaceae	Leaf extract is rubbed continuously over the stringed area, till cure. Lime and jiggery mixed and applied to affected part for three days.
33.	Tooth ache	(Marale soppu) (DU/BOT/AGA-VVP58) <i>Piper nigrum</i> (L.) (Kari menasu) (DU/BOT/AGA-VVP33) <i>Allium sativum</i> (L.) (Ballolli) (DU/BOT/AGA-VVP28) <i>Solanum torvum</i> (Sw.) (Kaadu badane)	Piperaceae Amaryllidiaceae Solanaceae	Leaf extract is mixed with <i>P. nigrum</i> , <i>Allium sativum</i> (L.) bulb is crashed and paste is applied to affected part, for three days. Fruit of the <i>S. torvum</i> is squeezed soaked with cotton and put in affected place, for an hour.
34.	Stomach Ulcer	<i>Tinospora cardifolia</i> (Willd.) (Amruta balli). (DU/BOT/AGA-VVP41)	Menispermaceae	Two inch fibre free root piece is taken, orally in the morning, for three days.
35.	Skin itches	<i>Butea monosperma</i> (L.) (Muttugada mara) (DU/BOT/AGA-VVP61) <i>Pongamia pinnata</i> (L.) (Hulagila mara) (DU/BOT/AGA-VVP62) <i>Encostemma axillare</i> (Lam.) (Karibantana balli) (DU/BOT/AGA-VVP63)	Fabaceae Fabaceae Gentleaceae	Seeds powder of <i>B. monosperma</i> , <i>P. pinnata</i> is mixed with 50 ml coconut oil, and milk of <i>E. axillare</i> is added and applied to affected part with a hen feather, for one week.
36.	Septic	<i>Mimosops elengi</i> (L.) (Najalu mara) (DU/BOT/AGA-VVP70) <i>Citrus medica</i> (L.) (Nimbe) (DU/BOT/AGA-VVP71)	Sapotaceae Rutaceae	The root of the <i>M. elengi</i> is made pasted along with <i>C. medica</i> fruit, and taken orally early in the morning.
37.	Vaajikaran	<i>Withania somnifera</i> (L.) (Ashwagandha) (DU/BOT/AGA-VVP29) <i>Asparagus racemosus</i> (Willb.) (Shatavari gida) (DU/BOT/AGA-VVP30) <i>Phoenix dactylifera</i> (L.) (Uttatti) (DU/BOT/AGA-VVP60)	Solanaceae Liliaceae Arecaceae	Roots of two plants are boiled in cow milk taken orally early in the morning, 3 dates are given orally, afterwards for one week.
38.	White jaundice	<i>Phyllanthus amarus</i> (L.) (Nela nelli) (DU/BOT/AGA-VVP72) <i>Cuminum cyminum</i> (L.) (Jeerige) (DU/BOT/AGA-VVP73)	Euphorbiaceae Apiaceae	The twig of <i>P. amarus</i> and seeds of <i>C. cyminum</i> are roasted and powdered, taken orally along with early in the morning for a week.

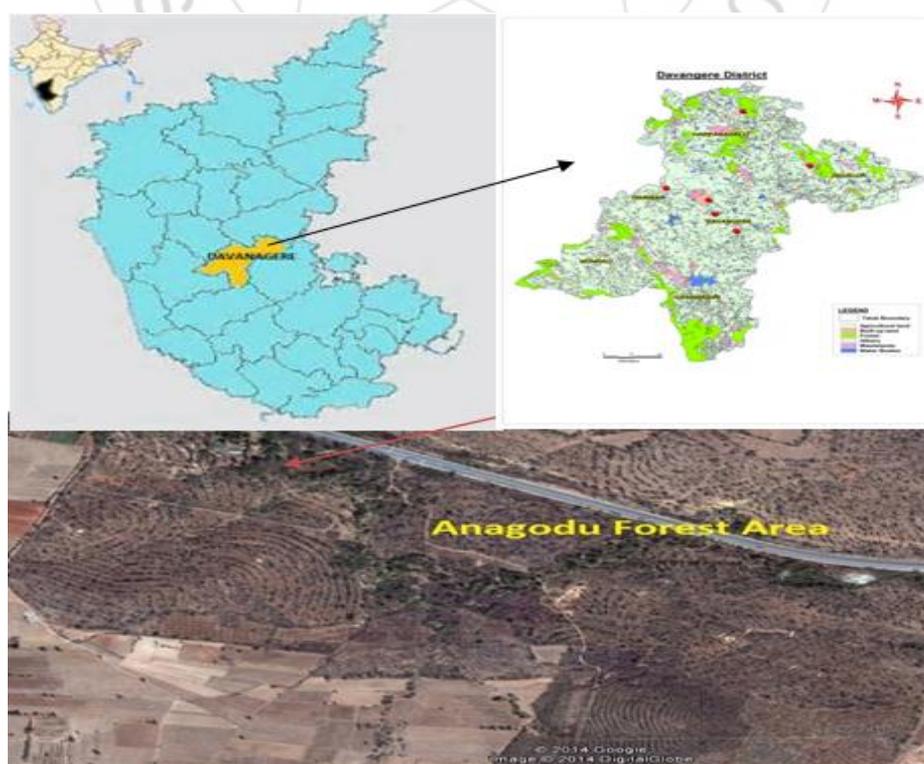


Figure 1: The location map of Anagodu Forest area.

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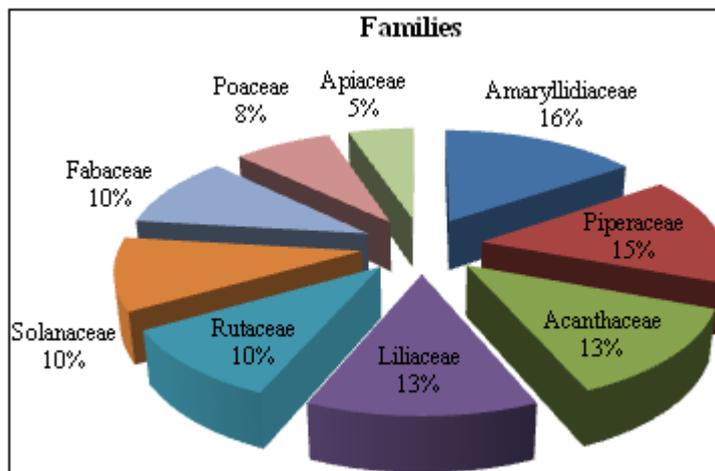


Figure 2: Percentage of families represented in treatment of different ailments in Anagodu forest region

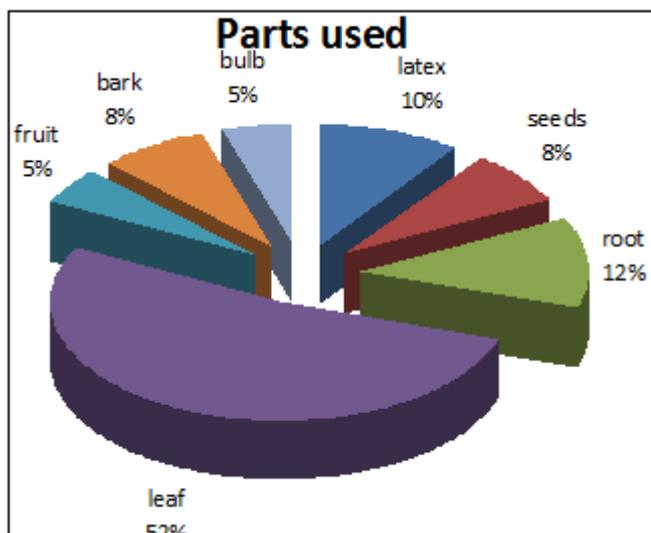


Figure 3: Plant parts used for human health care in Anagodu forest area

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