

# Indigenous Uses of Medicinal Plants of Keonjhar Forests, Odisha, India

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## Abstract

Based on field surveys during 2014-15, the present paper deals with the field observations on the traditional phytotherapy of indigenous people of the Keonjhar forest division of Keonjhar district, Odisha. A total of 64 folk medicinal plants species belonging to 60 genera and 31 families were collected from the study area and identified. First-hand information on medicinal uses was gathered from knowledgeable tribals, rural and traditional healers ('*Vaidyas*') through semi structured questionnaire. The inhabitants of the area investigated mostly rely on medicinal plants for the treatment of different types of ailments such as cuts, wounds, itching, eczema, burn sensation, boils, scabies, indigestion, stomachache, joint pain, headache, kidney stone, diabetes, jaundice, malaria etc. It is re-stressed that pharmacological and phytochemical investigations may be undertaken on all these reported folk medicinal plants to validate the claims. The information provided may also help in the discovery of new drugs of plant origin.

**Keywords:** Folk medicinal plants, Keonjhar forests, Odisha.

## Introduction

Herbal system of medicine has been practiced since historical times and traces its roots to ancient civilizations (Martin, 1995). Plants contain a large number of pharmacologically active ingredients and each herb possesses its own unique combination and properties. According to World Health Organization about 25% of modern medicines are developed from plants sources used traditionally; and in this context, this traditional knowledge of plants has led to the discovery of 75% of herbal drugs (Malla *et al.*, 2015; Mian-Ying *et al.*, 2002). Therefore, traditional knowledge of medicinal plants in the tribal people is unique source for exploring bioactive compounds of therapeutic importance in phytochemical research (Malla *et al.*, 2015; Newman, 2008; Sharma and Mujundar, 2003).

Odisha is rich with diversity of ethno-botanical species and valuable herbal medicinal knowledge (Sen and Behera, 2015). Keonjhar, the northern district of the Odisha state, lies between 21°63' N latitudes and 85°60' E longitude and spread over an area of 8,240 km<sup>2</sup>. About half area of the district (4043 km<sup>2</sup>) is covered by tropical moist deciduous type forests which possess good amount of diversity of medicinal plants. The district is the homeland of various tribal communities which constitutes 43.88% of its total population, out of which about 86.36% tribal communities are living in the rural areas of different isolated hill pockets (as per 2001 census). The principal tribes of area are Bathudi, Bhuyan,

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Bhumij, Gond, Ho, Juang, Kharwar, Kisan, Kolha, Kora, Munda, Oraon, Santal, Saora, Sabar and Sounti. Due to poverty and lack of primary health care centers (PHC's) in many areas, they depend on the herbal products to cure various ailments. Generally, the people of this area still have a strong belief in the efficacy of herbal medicines and possess a good amount of knowledge regarding the medicinal plants. Though, traditional knowledge among indigenous people exist orally in most parts of Odisha without any manuscript, therefore in the emerging threats of modernization, industrialization and lack of interest of local youth to learn the traditional knowledge from the old herbal healers, it is constantly eroding due to lack of proper recording (Gadgil, 1996; Utarsh et al., 1999). Therefore, it has becomes imperative to document the valuable indigenous knowledge of these plants before it is lost. Consequently the present study is an effort with the ultimate aim of exploring the phytodiversity and their utilization pattern in the study area.

A review of literature, however, indicates that the forests of Keonjhar were earlier investigated in 1980 collecting some 277 medicinal plants species. Of these, 79 were reported to be used in folk medicines of the study area comprising 34 recipes for treating various diseases and conditions (Singh and Dhar, 1993; Singh and Khan, 1989).

## **Material and Method**

Field surveys were carried out during December, 2014 to January, 2015 to collect ethno-medicinal plants from the study area. Some 57 villages of BJP, Patana, Ghatgaon and Keonjhar forest ranges of the district were explored to collect the botanical specimens and folk information on medicinal plants. The studied villages were located in interior pockets surrounded by hills and forests. The information on traditional knowledge of medicinal plants species were collected by interacting and discussions with the local traditional healers '*Vaidyas*', elderly knowledgeable people, and various tribal communities through semi-structured interviews. The medicinal plants specimens collected during the field trip were mostly known to the local informants.

For collecting, preserving and identifying the plant specimens standard procedures were adopted (Jain and Rao, 1977). The terminologies followed for describing and identifying the plants are in conformity with Harris and Harris (1994), Jain and Rao (1977) and Womersley (1981). International Code of Botanical Nomenclature, Ambasta (1986), Bennet (1987) and several other floras have been followed for correctly naming the plants. Plant specimens were identified with the help of flora of Odisha (Saxena and Brahmam, 1996), Botany of Bihar & Orissa (Haines, 1921-25) and other regional floras. Botanical

specimens are deposited in the Herbarium of the Survey of Medicinal Plants Unit of Regional Research Institute of Unani Medicine, Bhadrak for future reference.

## Observations

The present study identifies and documents some 64 plants species which are well known for medicinal value by virtue of their tribal and rural traditional practices. Medicinal plants species discussed are provided with botanical names, their family, local names, locality with collection number, part(s) used, medical efficacy claimed, and mode of administration in respect to different diseases:

*Abrus precatorius* L. (Fabaceae); Rati/Runjo; Newgaon-10127; Fruit; to improve eye site and itching; Fruits extraction is used to improve eye site. Leaves paste is used for itching.

*Acacia auriculaeformis* A. Cumm. (Mimosaceae); Akashi/Jangli jalebi; Biokhuntia-10056; Leaf, and stem; Headache and bloody dysentery; Extraction of leaves used for headache and bloody dysentery. The stem is used for cleaning teeth.

*Acacia nilotica* (L.) Del. syn. *A. arabica* Willd. (Mimosaceae); Babool; Goripokhari-10137; Bark; Diarrhea; Powder of bark is taken orally to cure diarrhea.

*Achyranthes aspera* L. (Amaranthaceae); Apamarang; Dhudh Kundh-10042; Leaf and root; Diarrhea and cut/wound; Extraction of fresh leaves (5-6 ml) is orally given for diarrhea and externally it is also applied on cuts and wounds for healing. Root is used for cleaning teeth.

*Aegle marmelos* Corr. (Rutaceae); Bel Ptra; Godo Chompe-10045; Leaf; Diabetes; Leaves extraction is used for diabetes.

*Aerva lanata* (L.) Juss. ex Schults. (Amaranthaceae); Paunsia; Junga-10191; Whole plant; Wound and kidney stone; Extraction of whole plant is used for healing on wounds. Decoction of whole plant is used for kidney stone.

*Alangium salvifolium* (L.f.) Wang (Alangiaceae); Ankulo; Kontiyapada-10150; Root; Diabetes; Roots are dried in shade and made into powder. One tablespoon of powder is taken for diabetes.

*Albizzia lebbek* (L.) Benth. (Mimosaceae); Siris; Goripokhari-10136; Bark; Boils; Bark paste is used to cure boils.

*Aloe barbadensis* Mill. syn. *A. vera* (L.) Burm.f. (Liliaceae); Ghritkumari, Batkumari; Ban Mohuldih-10108; Whole plant; Diabetes; Decoction of whole plant is used for diabetes.

*Alternanthera pungens* Kunth. (Amaranthaceae); Gonthi Gass; Koipur-10088; Whole plant; Malaria and itching; Decoction of whole plant is used for malaria and itching.

*Amaranthus spinosus* L. (Amaranthaceae); Kanta Mariso; Godo Chompe-10044; Leaf; Indigestion; Leaves decoction is used for indigestion.

*Andrographis paniculata* (Burm.f.) Wall. ex Nees (Acanthaceae); Bhuni/Bhuinimo; Mundura-10059; Leaf; Menstrual cycle problem; Extraction of fresh leaves is given for menstrual cycle problem.

*Argemone mexicana* L. (Papaveraceae); Agar; Dhumuria-10119; Whole plant; Skin diseases; Past of whole plant is used for skin diseases.

*Asparagus racemosus* Willd. (Liliaceae); Satmuli; Tandijoda-10073; Whole plant; Jaundice; Extract of plant is used for jaundice.

*Atylosia scarabaeoides* Benth. (Fabaceae); Ban kulthi; Janghira-10185; Seed; Kidney stone; Seeds are boiled in three cup of water and when one cup left, decoction is consumed for kidney stone.

*Azadirachta indica* A. Juss. (Meliaceae); Maha neem; Baraduta-10080; Leaf and stem; Fever; Leaves extraction is used for fever. Stem is used for cleaning teeth.

*Bambusa bambos* Druce syn. *B. arundinacea* Willd. (Poaceae); Bansa; Molipasi-10102; Leaf and root; Skin disease (eczema); Leaves and root paste is used for skin disease such as eczema.

*Bauhinia purpurea* L. (Caesalpiniaceae); Dev Kanchan; Koipur-10084; Leaf and bark; Leucorrhoea and digestion; Decoction of bark is used to cure leucorrhoea. Young leaves consumed in cooked form to improve digestion.

*Bryophyllum calycinum* Salisb. syn. *Kalanchoe pinnata* Pers. (Crassulaceae); Amarpoi; Nippo-10075; Leaf and root; Jaundice and Headache; Leaves decoction is used for jaundice and root paste is used for headache.

*Cassia fistula* L. (Caesalpiniaceae); Sunari; Baipada Dhar-10096; Seed; Gastric problem; Seed powder is used for gastric problem.

*Cassia tora* L. (Caesalpiniaceae); Chakunda; Madhavpur-10111; Seed; Itching; Seeds paste is used for itching.

*Celosia argentea* L. var. *argentea* Weight. (Amaranthaceae); Longa; Biokhuntia-10057; Leaf; Itching; The paste of fresh leaves is used for itching.

*Centella asiatica* (L.) Urban (Apiaceae); Thalkudi; Talpada-10070; Leaf; Joint pain and eczema; Paste of young leaves is used for joint pain and eczema.

*Chloroxylon swietiana* DC. (Rutaceae); Bheru; Mundura-10061; Leaf; Indigestion; Leaves powder is used for indigestion.

*Chromolaena odorata* (L.) King. & Robins. (Asteraceae); Poksunga; Bansapal-10040; Leaf; Cuts/wound; Extraction of young leaves is used on cuts and wounds for healing.

*Cleistanthus collinus* (Roxb.) Benth. ex Hook.f. (Euphorbiaceae); Korda/Sidi; Mangal Pur-10133; Root; Heel cracks; Root paste is applied on heels to cure cracks.

*Costus speciosus* (Koenig.) Smith. (Zingiberaceae); Ban-maka; Hatinota-10125; Root; Constipation; Dry roots are grinded into powder and one table spoon is consumed for constipation in the morning.

*Crotalaria pallida* Ait. syn. *C. stricta* DC. (Fabaceae); Nirmishi; Poipani-10142; Leaf; Cut/wound; Leaves paste is used on cuts and wounds.

*Croton bonplandianus* Baill. syn. *C. sparsiflorus* Morong (Euphorbiaceae); Ban Maricho; Poipani-10141; Leaf; Scabies; Leaves paste is applied to cure scabies.

*Cuscuta reflexa* Roxb. (Cuscutaceae); Banpoi; Gonasika-10054; Whole plant and stem; Joint pain and urinary tract infections; Paste of whole plant is used for joint pain and decoction of stem is used to cure urinary tract infections.

*Datura fastuosa* L. syn. *D. metel* L. (Solanaceae); Kala datura; Dhumuria-10120; Leaf; Swelling; Extraction of fresh leaves juice is used for swelling,

*Dendrophthoe falcata* (L.f.) Etting syn. *Loranthus longifolius* Desr. (Loranthaceae); Malang; Godo Chompe-10046; Bark; Menstrual cycle problem; The decoction of bark is used to regulate the menstrual cycle.

*Eclipta alba* (L.) Hassk. syn. *E. prostrata* (L.) L. (Asteraceae); Bhringraaj; Buxibaringao-10202; Root; Constipation; Roots powder is used for constipation.

*Elephantopus scaber* L. (Asteraceae); Mayur Chudi; Bansapal-10038; Root; Cut/wound; Roots paste is used to cure cuts and wounds.

*Eranthemum roseum* (Vahl) R.Br. (Acanthaceae); Daskrinda; Ban Mohuldih-10105; Root; Burn sensation; Roots past is used to reduce burning sensation.

*Holarrhena pubescens* (Buch.-Ham.) Wall. ex. G. Don. syn. *H. antidysentrica* Wall. (Apocynaceae); Kurchi; Kontiyapada-10149; Bark; Fever; Decoction of bark is used to cure fever.

*Jatropha gossypifolia* L. (Euphorbiaceae); Gabo; Kuntapada:10140; Leaf; Cut/wound; Paste of leaves is applied on cuts/wounds.

*Justicia adhatoda* L. syn. *Adhatoda zeylanica* Medic. (Acanthaceae); Basongo; Baraduta-10079; Leaf; Fever; Leaves are boiled in three glass of water and when one glass left decoction is given to cure fever.

*Macaranga peltata* (Roxb.) Muell.–Arg. Syn. *Macaranga indica* Wight. (Euphorbiaceae); Pohari; Talpada-10068; Bark; Kidney stone; Bark is used for kidney stone.

*Madhuca indica* J. F. Gmel syn. *Bassia latifolia* Roxb. (Sapotaceae); Mahua; Mundura-10066; Bark; Diarrhea; Decoction (5-10 ml) of bark is used for diarrhea.

*Michelia champaca* L. (Magnoliaceae); Champaka; Koipur-10087; Bark; Fever; Decoction of bark is used for fever.

*Mucuna prurita* Hook. (Fabaceae); Bi-danko; Maidankel-10114; Root; Bodyache; Roots paste is applied for body ache.

*Murraya koenigii* (L.) Spreng. (Rutaceae); Bhursunga; Poipani-10144; Leaf; Indigestion; Leaves are consumed with normal diet for indigestion.

*Nyctanthes arbor-tristis* L. (Oleaceae); Singarhar; Hatinota-10123; Leaf; Fever; Leaves powder is used to cure fever.

*Phyllanthus emblica* L. syn. *Emblica officinalis* Gaertn. (Euphorbiaceae); Dhatri; Kandiposi-10097; Leaf; Stomachache; Juice of leaves is used to cure for stomachache.

*Pongamia pinnata* (L.) Pierre syn. *P. glabra* Vent. (Fabaceae); Karanjo; Bansapal-10037; Seed oil and root; Skin disease, joint pain and to kill lice; Seed oil is used for skin disease, joint pain and to kill lice. Roots are used for cleaning teeth.

*Pterocarpus santalinus* L. (Fabaceae); Rakat Chandan; Headache and skin problem (boils, skin eruption, infection); Beguna Khamana: 10129; Wood; Wood paste is applied on forehead to reduce headache. Paste of wood also applied on skin problem such as boils, skin eruption and infection.

*Rauvolfia serpentina* (L.) Benth. ex Kurz. (Apocynaceae); Patal Garud; Maidankel-10113; Root; Snake bite; Root extraction is used for snake bite.

*Rauvolfia tetraphylla* L. (Apocynaceae); Patal Garudo; Hatinota-10126; Root and Fruit; Snakebite and indigestion; Roots are used for snakebite. Fruits extraction is used for indigestion.

*Santalum album* L. (Santalaceae); Chandan; Mangal Pur-10131; Wood and leaf; Headache and skin problem (allergy); Wood paste is applied on forehead to relief from headache. Leaves paste is used for allergy.

*Semecarpus anacardium* L.f. (Anacardiaceae); Bhalia; Purunia-10146; Seed; Heel cracks; Oil extracted from burned seeds is used to heal cracks of heel.



*Solanum nigrum* L. (Solanaceae); Putu Kundi; Dhudh Kundh-10043; Leaf; Jaundice; Juice (5-10 ml) of the leaves is used for jaundice till cure.

*Solanum surattense* Burm.f. syn. *S. xanthocarpum* Schrad. ex Wendl., *S. virginianum* L. (Solanaceae), Akranti; Gonasika-10053; Fruit; Wound; Fruits extraction is applied on wounds for quick healing.

*Sphaeranthus indicus* L. (Asteraceae); Bhui Kadam; Mangal Pur: 10130; Leaf; Cut/wound; Leaves paste is applied on cuts and wounds for healing.

*Stereospermum tetragonum* DC. (Bignoniaceae); Patudi; Kolimati-10183; Fruit; Joint pain; Fruits made into paste with mustered oil and hot paste is applied for joint pain.

*Strychnos nux-vomica* L. (Strychnaceae); Kochila; Dhamuni-10197; Seed; Fever and stomachache; Seed powder of plant is mixed with seed powder of *Piper nigrum* L. (Kali mirch), rhizome of *Zingiber officinale* Roscoe. (Saonth), seeds of *Trachyspermum ammi* (L.) sprague (Ajwain), fruits of *Myristica fragrans* Houtt. (Jayphal), seeds of *Helecteres isora* L. (Murod phalli), bark of *Cinnamomum zeylanicum* Blume (Dal Chini), fruits of *Ficus religiosa* L. (Pepal phal), fruits of *Piper Longum* L (Long), ghee honey and rock salt. All are mixed and made into tablets. Tablets are given for fever and stomachache pain.

*Syzygium cumini* (L.) Skeels (Myrtaceae); Jamun; Purunia-10147; Seed; Diabetes; Seed powered (10-15 gm) is used to cure diabetes.

*Tephrosia purpurea* (L.) Pers. (Fabaceae); Kulthia; Poipani-10143; Whole plant; Acidity; Plant extraction is used to cure acidity.

*Terminalia bellirica* (Gaertn.) Roxb. (Combretaceae); Baheda; Janghira-10186; Fruit; Diarrhoea and dysentery; Fruits powder is used for diarrhea and dysentery.

*Terminalia tomentosa* (Roxb. ex DC.) Wight. & Arn. syn. *T. alata* Heyne ex Roth. (Combretaceae); Aasan; Talpada-10067; Bark and leaf; Urinary infection and headache; Decoction of bark is given orally for urinary infection and paste of leaves is applied for headache.

*Vanda roxburghii* R. Br. syn *Vanda tessellata* (Roxb.) Hook. ex G. Don. (Orchidaceae); Madang; Mundura-10062; Leaf; Fever; Paste of leaves is applied on forehead during fever to slow down the temperature.

*Viscum articulatum* Burm.f. (Loranthaceae); Madang; Dhamuni-10199; Whole Plant; Arthritis; Dried plant is used as poultice to cure arthritis.

*Vitex negundo* L. (Verbenaceae); Begonia; Mundura-10065; Leaf and stem; Headache and Joint pain; Paste of leaves is used for headache and joint pain. Stems are used as toothbrush.

*Zizyphus mauritiana* Lamk. (Rhamnaceae); Ber; Jamidalia-10152; Leaf; Cut/wound; Leaves extraction is applied on cut and wound for quick healing.

## Results and Discussion

The present study has revealed the traditional folk medicinal uses of 64 plants species belonging to 60 genera and 31 families (Fig. 1). Top ten families are Fabaceae with 7 species followed by Amaranthaceae, Euphorbiaceae (5 sps. each), Asteraceae (4 sps.), Acanthaceae Apocynaceae Caesalpiniaceae

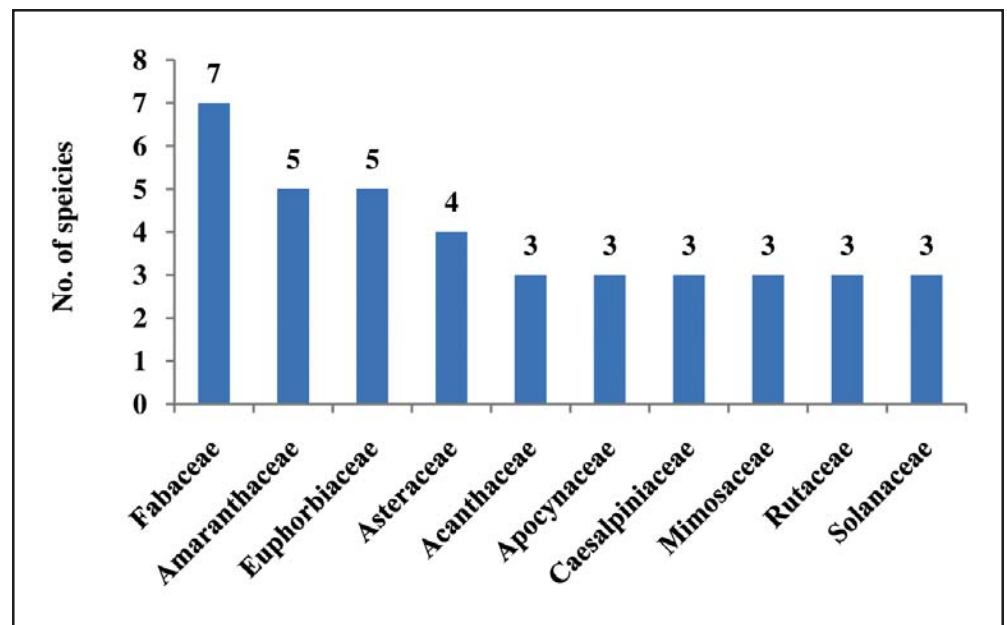


**Figure 1:** Some ethnomedicinal plants of the study area.

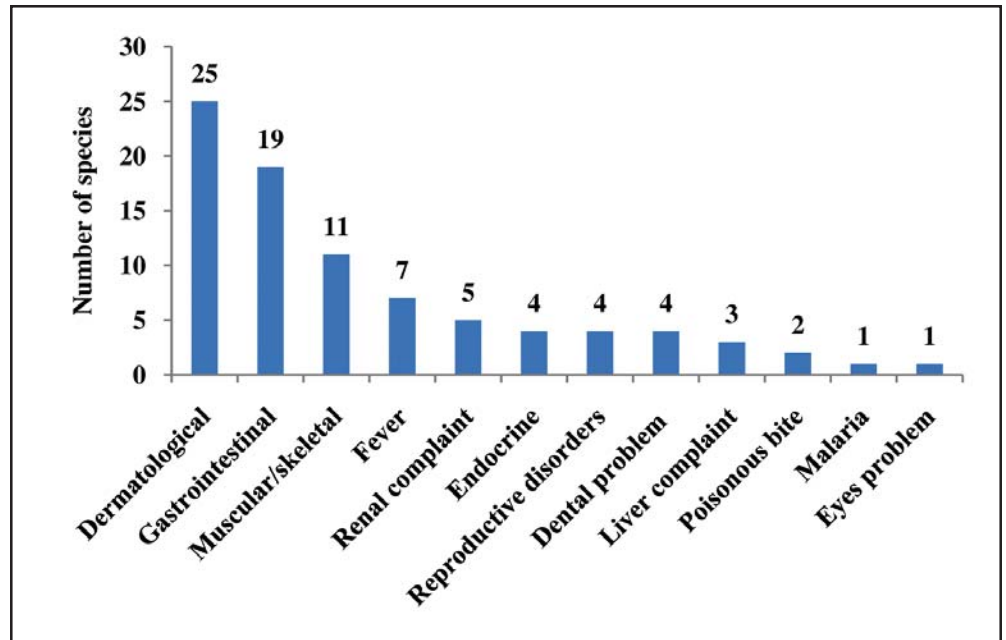


Mimosaceae Rutaceae and Solanaceae (3 spp. each) (Fig. 2). Rest of the families are represented by one or two species.

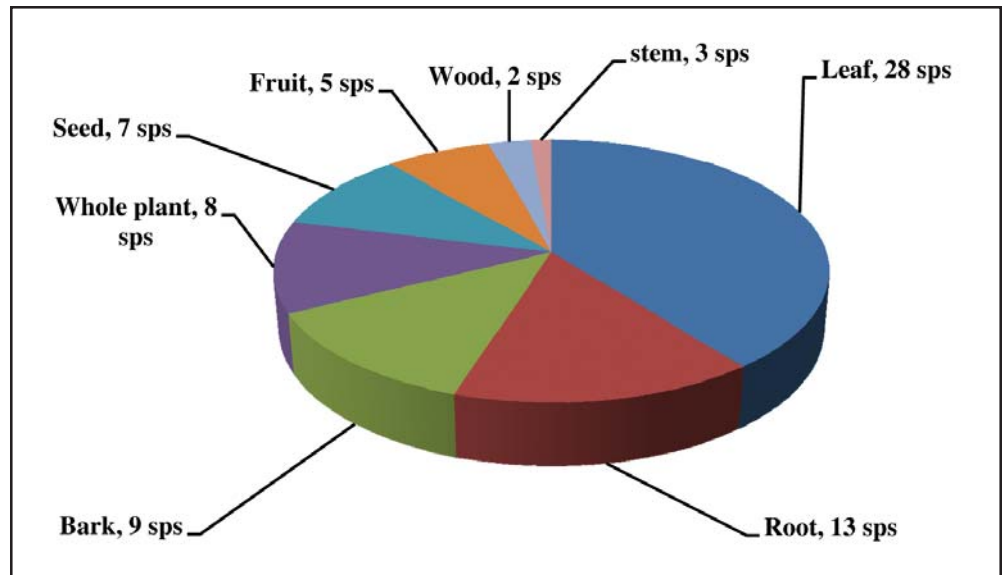
Folk medicinal species collected are used to treat 30 different types of ailments. Most of the species are used for dermatological problems such as cuts, wounds, itching, eczema, burn sensation, skin eruption, boils, scabies, heel cracks followed by gastrointestinal problems (indigestion, bloody dysentery, gastric problem, stomachache, constipation, acidity, dysentery); muscular/skeletal problem (joint pain, headache, arthritis); fever; renal complaint (urinary tract infection, kidney stone); endocrine disorder (diabetes); reproductive disorders (leucorrhoea, menstrual cycle problem); dental problem; liver complaint (jaundice); poisonous bite; malaria and eye problem (Fig. 3). Different plants parts used for making herbal preparations to cure these ailments are leaves, roots, stem, bark, whole plant, seeds, fruit, wood, and stem (Fig. 4). Mostly the local inhabitants use freshly collected plant parts to prepare the formulation but sometimes seeds, barks and other useful plant parts are collected, dried and stored in homes for future use. They have been employing all these plants in the form of paste, powder, decoction, extraction, juice, oil and also in cooked form. Of the 64 plants uses, 70% of the applications are internal and 30% external. Majority of the external uses are for dermatological problems, muscular/skeletal problems and dental problems; internal uses are for conditions affecting the gastrointestinal complaints, renal complaints, liver complaints, endocrine disorders etc. The highly interesting findings for dermatological problems and gastrointestinal problems require further confirmation and research, while the efficacy of the various other indigenous uses will need to be subjected to scientific



**Figure 2:** Top ten families with species number in the study area



**Figure 3:** Graph showing categories of ailments cured by different plant species in the study area



**Figure 4:** Pie diagram showing different plant part used for curing various ailments in the study area

validation. Information on folk medicinal uses of plants collected from the study area are compared with the existing literature on folk medicines (Ali *et al.*, 2010; Aminuddin *et al.*, 2013; Aminuddin and Girach, 1996; Anonymous, 2001; Behera *et al.*, 2008; Behera *et al.*, 2006; Dhal *et al.*, 2014. Girach *et al.*, 2011; Jain, 1991, Kandari *et al.*, 2012; Kirtikar and Basu, 1935; Mallik *et al.*, 2012; Mukesh

*et al.*, 2011, 2012, 2014a,b; Patra *et al.*, 2014; Raut *et al.*, 2009, 2013; Sahu *et al.*, 2010, 2013a, b; Sen and Behera, 2015; Singh and Dhar, 1993). It has been revealed that majority of the folk claims reported here are either less known or imperfectly known although their mode of administration, ingredients used and plant parts were different. Therefore, present study represents contemporary uses of medicinal plants for the area investigated. It is suggested that detailed phytochemical, pharmacological and clinical researches should be undertaken on all these folk medicinal plants in the context of claims reported. This may help in discovering new therapeutic agents of natural origin, hitherto, unknown to science.

It has also been observed that over exploitation of some species, destructive way of collection, vulnerability due to anthropogenic pressure are some of the major threats to these medicinal plants; therefore, a multi-disciplinary approach must be considered which includes ecological, biological, socio-cultural and economical aspects of these valuable species.

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