



Ethnobotany and Folk Medicines Used by the Local Healers of Bhadrak, Odisha, India

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THE PRIMARY objective of this study is to present a database of indigenous knowledge on medicinal plants used to cure diseases among the local traditional people of Bhadrak district of Odisha, which could provide novel remedies for diseases. The study highlights the use of local flora (wild and cultivated plant species); explore; identify; ethnobotany and conservation of Bhadrak district. It also pays heed to the proper utilization of flora as a way of highlighting its ethnopharmacological importance. A field survey was conducted to collect the information about floral diversity in and around the study site. Data on the use of plants were collected with a semi-structured questionnaire and from the peer reviewed literatures. A total of 85 plant species belongs to 46 different families were identified and documented along with their botanical name. Among them Cucurbitaceae, Asteraceae, Euphorbiaceae, Solanaceae, Amaranthaceae, Fabaceae and Rutaceae were found to be dominated families. It is concluded that many people in the studied area still depend on medicinal plants for their treatment of different diseases like urinary tract infections, gastrointestinal tract infections, piles, tumors, asthma, diabetes, etc. This study needs to harness this traditional knowledge and preserve for the betterment of future mankind.

Keywords: Diseases, Ethnobotany, Indigenous, Questionnaire, Traditional.

Introduction

Ethnobotany is the study of people and the study of plants, this is represented the good relationship between wild plants (Herbs, Shrubs and Trees) and tribal's. Ethnobotany is the branch of Ethnobiology and complete information about plants and their medicinal uses is given by ethnobotanical studies (Rahul, 2013). Plants represent important natural resources that can produce various products and chemicals for all life. Ethnobotany represents historical and present plant use to fulfill a wide variety of human needs, so the documentation of ethnobotanical knowledge is important for species conservation and sustainable use of resources and these studies are important for leading to the discovery of crude drugs. India is one of the twelve mega

biodiversity countries of the world, having rich vegetation with a wide variety of medicinal plants and a tradition of plant-based knowledge distributed a vast number of ethnic groups. The use of traditional medicine remains widespread in developing countries, while the use of complementary alternative medicine (CAM) is increasing rapidly. For meeting the future needs, the cultivation of medicinal plants has to be encouraged. Plants and plant-based medicaments are the basis of many of the modern pharmaceuticals we used today for our various ailments. At a time, nearly all medicines were derived from biological resources (Yuan et al., 2016). In India, almost 95% of the prescriptions are plant-based in the traditional systems of Unani, Ayurveda, Homoeopathy and Siddha (Savithamma et al., 2007; Mahalik et al., 2015).

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The vegetation of the Bhadrak of Odisha, India has high ethnobotanical values by its rich floral diversity. People in the urban area are highly dependent on the plants and plant-based medicine. The present study highlights the use of local flora, explore, identify, ethnobotany and conservation of wild and cultivated plant species in the city of Bhadrak, Odisha, India. In the rural communities, wounds arising from bruises, cuts and scratches are sometimes untreated at the initial stages, which is also a common problem. In most cases such wounds become septic and inflamed before they are brought to the attention of parents, who might treat such wounds in a traditional way using plant materials or seek the advice of an herbalist (Grierson & Afolayan, 1999). According to the World Health Organization (WHO), about 4 billion people in developing countries not only believe in the healing properties of plant species but also use them regularly (Rai et al., 2000).

Since medicinal plants are easily affordable they play a vital role not only for pharmacological

research and drug development, but also when plant constituents are used directly as therapeutic agents and as starting materials for the synthesis of drugs. The study is based on the interviews with local traditional practioners, tribals and villagers living in this study area and entirely dependent on the plants occurring around them.

Materials and Methods

Study area

The study has carried out in Bhadrak district, Odisha, India falls within a geographical tract of 20° 43'–21° 13' N latitude and 86° 6'–87° E longitude. The total area of the district is 2505 Km² with a population of 1.507 million (2011 Census). It is bounded on the north by Balasore district, on the east by the Bay of Bengal and Kendrapara district, on the south by Jajpur district and west by Koenjher district (Fig. 1). The district is inhabited by a large section of rural population and different tribes. People of the area practice agriculture and grow paddy, mustard and vegetables.

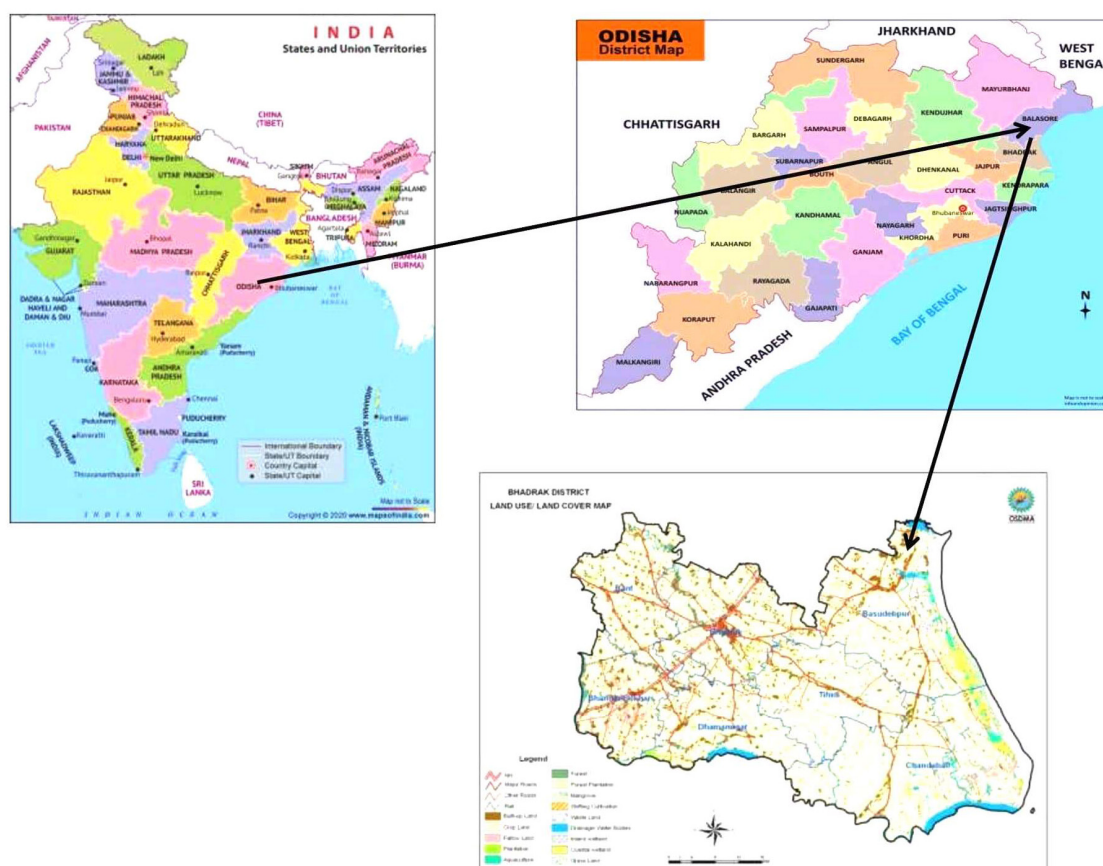


Fig. 1. Map indicating the location of the study area

Climate of Bhadrak district

The climatic condition of the district is generally hot with high humidity during April and May and cold during December and January. This city has a tropical climate. In winter, there is much less rainfall than in summer. The average annual temperature in Bhadrak is 26.8°C

Field survey

Various tribal rich forest pockets of the district were identified and field trips were conducted at regular intervals in differing seasons. Tribal uses of plants as medicine were studied *in situ* by establishing close intimacy with the tribal healers. Care was taken to prioritize vulnerable areas for immediate attention especially forest pockets which are under intensive mining activity. Folklore claims were documented along with voucher specimens. As different species come to flowering and fruiting at different seasons, field surveys were executed in such a way as to accommodate relevant information in different stages of their life history (Mahalik et al., 2015).

Data recording

The detailed information about the plants, dosages, method of preparation, mode of administration, precautions to be taken was recorded. The folklore claims as revealed by the practitioner in colloquial languages were recorded in the tape recorder and standard questionnaires. Wherever difficulties were encountered in understanding the language, the tapes were replayed before the tribal chief and the correct meaning were translated.

Plant collection and herbarium studies

The supportive plant specimens of folklore claims were collected, processed, critically studied, identified and preserved in the form of the herbarium and deposited at the Department of Botany, Centurion University of Technology and Management (CUTM) Bhubaneswar Campus, Odisha. Different Herbaria of Bhadrak that held the specimens of earlier workers were visited and checked their identity. Voucher specimens were identified by referring standard local floras (Saxena & Brahmam, 1994-1996; Haines, 1921-1925).

Cris-cross checking

An effort was made to cross check the folklore claims. This study involved checking and rechecking of particular folklore claims by the

different dwellers of the same tribe in different forest pockets. This had cleared many doubts regarding the use and identity of plant specimens.

Local names

Vernacular names in vogue in the different tribal languages and Odia were given.

Ethnobotanical noting

A brief but crisp note about the uses of the plants by the local inhabitants is given. Every care is taken to avoid ambiguity as regards to plant part, quantity, dosage, method of preparation, mode of administration of the drug or drugs.

Results and Discussion

The present study was conducted to investigate the use of traditional medicinal plants in the treatment of various diseases in the Bhadrak district of Odisha. Persons above 45-75 (37 number of male and 21 female practitioners) of age had more traditional knowledge about medicines. It was observed that 85 traditional medicinal plants were used by the local people for the treatment of many diseases. After identifying the plant specimens, it was found that the information is quite interesting and worth pursuing for their efficacy. All the data was cross checked with the published literature (Aminuddin & Girach, 1991; Bal, 1942; Das & Kant, 1998; Tribedi et al., 1982; Satapathy, 2008; Mahalik et al., 2014, 2015; Dash et al., 2018, Sahoo & Mahalik, 2020).

A total number of 85 medicinal plant species were recorded belonging to 46 families, among them Cucurbitaceae, Asteraceae, Euphorbiaceae, Solanaceae, Amaranthaceae, Fabaceae and Rutaceae were found to be the dominant families in Bhadrak. Most of the identified species were herbs (45%), trees (33%), shrubs (8%) and climbers (24%) (Figs. 2, 3). The plant parts such as seed, root, leaves, branch, bark, fruit, flower, latex, gum, pulp, etc. were used by local people and tribes for preparing various herbal drugs. Furthermost of the plant were leaf (61%), root (36%), seed (35%), whole plants (18%), bark (20%), flower (26%), branch (12%), gum (4%), pulp (3%), bud (3%), latex (8%) and fruit (33%) (Fig. 4). An ethnobotanical survey is most useful for scientists, research scholars and scientific companies for further studies on the isolation and identification of active formulated into antibiotic

drugs. During the survey, the most common plants like *Achyranthes aspera* L., *Apium graveolens* L., *Azadirachta indica* L., *Solanum lycopersicum*, *Clitoria ternatea* L., *Cyperus scariosus* R.Br., *Ocimum sanctum* L., *Ananas comosus* (L.) Merr., *Acmella paniculata* (Wall. Ex DC) R.K. Jansen, *Phyllanthus fraternus* G.L. Webster, *Cynodon dactylon* (L.) Pers., *Citrus limon* (L.) Burm.f., *Citrus medica* L., *Vitex negundo* L., *Moringa oleifera* Lam., *Zingiber officinal* Rosc. are useful in the treatment of fever. Some plant- like *Albizia lebbbeck* (L.) Benth., *Zingiber officinal* Rosc., *Moringa oleifera* Lam., *Mimusops elengi* L.,

Syzygium cumini (L.) Skeels, *Tagetes erecta* L., *Psoralea corylifolia* L., *Acmella paniculata* (Wall. Ex DC) R.K. Jansen, *Cascabela thevetia* (L.) lippold., *Oxalis corniculata* L., *Ficus religiosa* L., *Erythrina variegata* L., *Eclipta alba* (L.) Hassk., *Apium graveolens* L. and *Achyranthes aspera* L. are used in toothache and tooth problems. Some plants that used to cure many diseases like cough, cold, bronchitis, asthma, tuberculosis, fever, skin diseases, bone fracture, stomach-ache, diarrhea, dysentery, gastric, digestion problem, respiratory problem.

■ Herb ■ Shrub ■ Climber ■ Tree

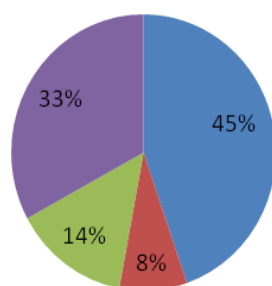


Fig. 2. Habit wise flora of Bhadrak district of Odisha.

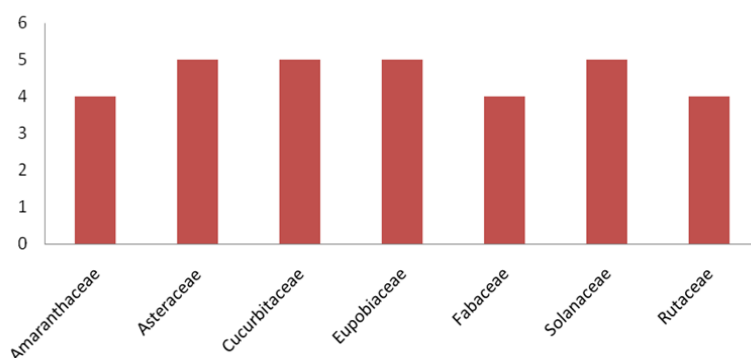


Fig. 3. Dominate plant family in Bhadrak district of Odisha

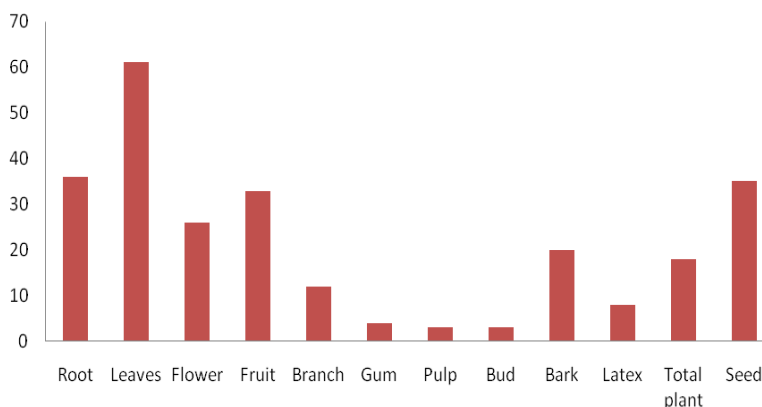


Fig. 4. Plant parts used for different medicinal purposes

Recent literature revealed that *Allium cepa* L. is used as cataplasm with salt or wine or with olive oil to treat skin burns, bruises and edemas in two cities viz. Edessa, Naoussa and nearby villages of Central Macedonia, Greece decoction of *Apium graveolens* L. is also used against hypertension and the seeds boiled with milk is used to treat symptoms of common cold *Aloe vera* L. gel is used on wounds, sunburns and insect bites. *Cucurbita pepo* L. juice is also reported to treat gastric ulcer (Efthymia et al., 2019). In this study it was found that *Momordica charantia* L. leaf juice is used to treat skin diseases, which is also reported in the folk medicine in Central Macedonia, but the oil extract is used on goats and pigs. In this study it was observed that the seeds of *Carica papaya* L. are used to treat indigestion problem which coincided with the

study conducted in South East Ethiopia, where the seeds were ground and boiled with coffee and taken with honey to treat diarrhea (Jima & Megersa, 2018). *Anacardium occidentale* L. is reported to be used to different skin ailments along with maintaining good health which is also proved because of presence of various secondary metabolites in its leaf, shoot, fruits and other parts of the plant, which can be used for their nutraceutical, medicinal and biological aspects. This information transferred from generations is a very useful source for scientific research in the field of medicine and new drugs can be developed using these sources (Salehi et al., 2020). The medicinal and ethnobotanical values of the different collected plant species are provided in Table 1.

TABLE 1. List of ethnomedicinal plants

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
1	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apamaranga	Seed, leaves, root, branch etc.	<ul style="list-style-type: none"> ❖ Take 20gm of seeds and leaves mixed with 2-3 <i>Piper longum</i> to cure cough, asthma, fever and anti-chicken pox. ❖ The paste of roots and branches used to cure toothache, deafness, eye disorder, piles, and cholera. ❖ A decoction of leaves used against pain due to stones and also cure ulcers.
2	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Sapuri	Ripe fruit, green fruit, leaf.	<ul style="list-style-type: none"> ❖ Ripen and green fruit juice take an empty stomach in the morning to cure stomach problems. ❖ Leaf juice mixed with <i>Syzygium aromaticum</i> (1gm) and take twice a day to cure breathing problems and diabetes.
3	<i>Aglaia roxburghiana</i> (Wight & Arm.) Miq.	Verbenaceae	Biswaksena	Fruit, seed	<ul style="list-style-type: none"> ❖ Dry powder of seeds mixed with lukewarm water during painful maturation and fever. ❖ The paste of fruit used to treat skin diseases and inflammations.
4	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Kantasago	Total plant, leaves, seed etc.	<ul style="list-style-type: none"> ❖ Young leaves were consumed for health development. ❖ The paste of roots and seeds was used to treat urinary troubles, gonorrhoea and diarrhoea.
5	<i>Anacardium occidentale</i> L.	Anacardiaceae	Kaju	Fruit, seed, leaves, etc.	<ul style="list-style-type: none"> ❖ Fruit pulp was used as a health tonic as well as to treat a dry cough. ❖ Leaf paste (50gm) used to treat skin diseases. ❖ Syrup of seeds was used against cough and cold.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
6	<i>Apium graveolens</i> L.	Apiaceae	Juani	Whole plant, root, leaf, flower, fruit	<ul style="list-style-type: none"> ❖ The paste of whole plant, leaf or root used with earthen pot water daily in the early morning for one week to cure skin diseases, tooth problem, and cold. ❖ Dry flower and fruits (5-10gm) were taken with warm water to treat heart diseases asthma, diarrhoea, fever and worms.
7	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neema	Leaves, fruits, seed, flowers, bark, branch, soft tip	<ul style="list-style-type: none"> ❖ The paste of leaves, fruits, seeds, flowers, and the soft tip were used to treat skin disorder, eczema, chickenpox, plague, bleeding diathesis, malaria, fever, chronic fever, diabetes, calculus, piles. ❖ The decoction of bark used to cure vomiting, malaria, urinary disorder, jaundice, diarrhoea, acidity, hiccoughs, headache and tooth problem.
8	<i>Areca catechu</i> L.	Arecaceae	Gua	Fruit, seed	<ul style="list-style-type: none"> ❖ The decoction of nuts and fruit (20gm) is given once a day for one month to cure swelling of nose, throat and skin diseases.
9	<i>Acmella paniculata</i> (Wall. Ex DC) R.K. Jansen	Asteraceae	Akarkara	Whole plant, leaves, flower, stem, root, etc	<ul style="list-style-type: none"> ❖ The decoction of whole the plant used to treat giddiness, toothache, mouth smell, fever, and cough. ❖ The paste of flower applies in the face for 5 days to cure twice pimple and other skin problems. ❖ Dry powder of stem and roots is given twice a day with lukewarm water for one week to treat asthma, mental retardation, stomach problem and menstrual problem.
10	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Bela	Leaves, ripe fruit, root, unripe fruit	<ul style="list-style-type: none"> ❖ Dry powder of the leaf, unripe fruit, and roots mixed with an equal amount of turmeric powder is taken orally to treat stomach pain, indigestion, acidity, weak digestion, bleeding piles, cholera, vomiting, diabetes, and dysentery. ❖ Raw leaf (2-3 leaf) was taken empty stomach for 15 days to cure gastric problems.
11	<i>Aloe vera</i> (L.) Burm.f.	lilliaceae	Ghrita-kumari	Total plant, pulp, root, juices leaves	<ul style="list-style-type: none"> ❖ Juice of whole plants used to cure headache, alopecia, eye disorder, stomach pain, jaundices, constipation in children, diabetics etc.
12	<i>Allium cepa</i> L.	Liliaceae	Piaja	Bulb, leaf, flower	<ul style="list-style-type: none"> ❖ Juice of the bulb, leaf, or flower used to treat sleepiness, cold, throat problem, cough, asthma, calculus, cholera. ❖ Raw onion used in daily food help to reduce piles and blood pressure.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
13	<i>Albizia lebbek</i> (L.) Benth.	Mimosaceae	Sirisa	Seed, leaves, oil, bark, flowers	<ul style="list-style-type: none"> ❖ Seeds or oil extracted from seeds were used against skin diseases, tooth problems etc. ❖ The paste of leaves bark and flower were used to treat insect bite, poison and wound healing.
14	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees	Acanthaceae	Chiraita	Total plant, root, branch, leaves	<ul style="list-style-type: none"> ❖ Whole plant, roots, branches or leaves was grounded into a paste and used to treat leprosy, scabies, eczema. ❖ The paste of leaves (20gm approx.) was also used twice a day for 7 days to cure ringworm infection and pills.
15	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Amarpoi	Leaves, root, it's aerial part	<ul style="list-style-type: none"> ❖ 2-3 leaves were crushed and extracted the juice and used to treat eye infections, headache, hypertension. ❖ The paste of roots and aerial parts (30gm) mixed with honey and take twice a day to cure asthma, calculus, urinary disorder, bleeding diarrhoea.
16	<i>Brassica oleracea</i> L.	Brassicaceae	Olakobi	Total plant	<ul style="list-style-type: none"> ❖ The whole plant was used for cooking purposes. This also helps to cure constipation, heart problems etc.
17	<i>Borassus flabellifer</i> L.	Arecaceae	Tala	Fruit, seed, leaves, flower, root, etc.	<ul style="list-style-type: none"> ❖ Ripen fruits used for food. ❖ Dry powder of seeds, leaves, flowers and roots was given cold water for 15 days to treat eye problems, chest pain, ear pain, and skin diseases.
18	<i>Bambusa bambos</i> (L.) Voss	Poaceae	Baunsha	Leaves, root, etc.	<ul style="list-style-type: none"> ❖ The paste of leaves and roots was used against skin diseases, pimples, poison, mouth problems, ear problems, and headache.
19	<i>Impatiens balsamina</i> L.	Blsaminaceae	Hargaura	Leaves, root, etc.	<ul style="list-style-type: none"> ❖ The paste of roots and leaves mixed with another paste of <i>Lawsonia inermis</i> and apply hair to treat hair problems.
20	<i>Cucumis sativus</i> L.	Cucurbitaceae	Kakudi	Fruit, seed, Leaves, etc.	<ul style="list-style-type: none"> ❖ Raw fruits used as food to cure gastric problems and skin related problems. ❖ The paste of seeds and leaves was also used to treat skin diseases, throat problems.
21	<i>Citrus medica</i> L.	Rutaceae	Kagagi lembu	Bark of root, seed, flower, buds, and fruit	<ul style="list-style-type: none"> ❖ Fruit juice mixed with salt and sugar were used to control vomiting and loose motions. ❖ The decoction of bark, seeds, flowers and buds were also used against spleen, urinary disorder, and fever.
22	<i>Citrus limon</i> (L.) Burm.f.	Rutaceae	Lembu	Seed, fruit	<ul style="list-style-type: none"> ❖ Fruit juice mixed with salt and sugar were used to control Insanity, headache, vomiting, worms, jaundice, cholera, diarrhoea ❖ The paste of seeds directly applies in the area of insect bite, scorpion bite, itching for instant relive.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
23	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Duba ghasa	Total plant, leaves	❖ Leaves or total plants were ground with 5-10 leaves of <i>Ziziphus mauritiana</i> and twice a day for one month to cure nasal bleeding, mouth problem, vomiting, urinary problem, malaria fever.
24	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Thalakudi	Total plant, leaves	❖ The paste of whole plant and leaves used during food to boost memory power, it also used to treat sleeplessness, anxiety, hair fall, blood pressure, and chickenpox.
25	<i>Cyperus scariosus</i> R.Br.	Cyperaceae	Nagamutha	Total plant, root, leaves, stem	❖ The paste of all parts was mixed with old jaggery is given 7 days to cure epilepsy, disinterest in food, vomiting, fever, ulcer, and wounds.
26	<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Nirmuli-lata	Total plant	❖ Paste of total plants used against hair problem, Eye problem, Nervous disorder, stomach problem, Liver disease, piles and blood purification.
27	<i>Curcuma longa</i> L.	Zingiberaceae	Haladi	Leaves, stem	❖ The paste of rhizome (stem), or leaves was taken with half a litre of cold water at night for 10 days to cure jaundice, cough, cold, stomach pain, diarrhoea, urinary disorder, and piles.
28	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Pita kunduri	Leaves, total plant, root, flower.	❖ 10-20gm of plant parts paste used to treat hair problems, fever, poisonous, wound, skin diseases, diabetes, and headache.
29	<i>Clitoria ternatea</i> L.	Fabaceae	Aparajita	Fresh fruit beans, root's juice, dried root powder, leaf, bark	❖ The paste of all plant parts is used to cure headache, migraine, tonsil, jaundice, fever, boils, normal delivery, ulcers and wounds.
30	<i>Citrus grandis</i> (L.) Osbeck	Rutaceae	Batapi	Fruit, leaves, seed, pulp, etc.	❖ Raw fruits and pulp was eaten to treat diarrhoea and stomach ❖ The paste of leaves and seeds were used to cure skin diseases.
31	<i>Carica papaya</i> L.	Caricaceae	Amrutab-handa	Fruit, seed, latex, leaves, etc.	❖ The ripen fruits used to cure ulcers, mouth diseases. ❖ Dry powder seeds and leaves are taken with lukewarm water to cure piles, indigestion, malaria etc. ❖ Dry latex mixed with Desi ghee to treat skin diseases.
32	<i>Capsicum annum</i> L.	Solanaceae	Lonka	Seed, fruit	❖ Powder of seeds and fruits (5-8gm) was used for the treatment of voice disorders, cholera, urinary disorder, and dog bite.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
33	<i>Calotropis gigantea</i> R.Br.	Asclepiadaceae	Arakha	Leaves, branch, latex, flower, stem, root, etc.	<ul style="list-style-type: none"> ❖ Juice of leaves taken orally against infertility. ❖ The paste of branches, stem, flower and roots mixed with 3-5 black pepper and taken orally once a day for 7 days to cure fever, stomach pain, skin parasites, piles, cholera, breathing problem, tooth removal. ❖ The paste of flower mixed with one cup of milk and takes orally to cure liver problems.
34	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Kakharu	Leaves, flower, branch, seed, fruit etc.	<ul style="list-style-type: none"> ❖ All the parts were used as food for health development.
35	<i>Cissampelos pareira</i> L.	Menispermaceae	Akanbindhi	Leaves	<ul style="list-style-type: none"> ❖ The pastes of leaves were used to stop bleeding.
36	<i>Datura metel</i> L.	Solanaceae	Dudura	Leaves, seed, branches.	<ul style="list-style-type: none"> ❖ The paste of leaves, seeds and branches are used headache, skin disease.
37	<i>Datura stramonium</i> L.	Solanaceae	Kaladudura	Leaves, seed, branches	<ul style="list-style-type: none"> ❖ In paste of leaves, seeds and branches are used headache, skin disease.
38	<i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Bhringaraj	Leaves, dried leaves, root, total plant	<ul style="list-style-type: none"> ❖ Dry powders of leaves, roots, and total plants (5-10gm) mixed with warm water and take orally for the treatment of hair disorders, eye disorders, toothache, cough, blood pressure, urinary problems, and stomach pain.
39	<i>Erythrina variegata</i> L.	Fabaceae	Paladhua	Bark, leaves etc.	<ul style="list-style-type: none"> ❖ The decoction of bark and leaves (50gm) used for the treatment of Fever, pimples, mouth problems, toothache, cough, indigestion, ear pain and eye diseases.
40	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Dhatri	Fruit, leaf, bark, root	<ul style="list-style-type: none"> ❖ Dry fruit and root powder are taken with lukewarm water for 15 days to treat eye swelling, hair problems, nasal bleeding, voice problem, vomiting, acidity, piles, bleeding piles, blood dysentery, and diarrhoea. ❖ The decoction of leaves and bark used for the treatment of jaundice, fever, and ulcer.
41	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Patra siju	Latex, leaves, flowers	<ul style="list-style-type: none"> ❖ Latex is used to stop nasal bleeding and snake bite. ❖ Powder of leaves and flowers (25gm) mixed with Zinger juice and take with warm water to cure night blindness, asthma, and diabetes.
42	<i>Eichhornia crassipes</i> (Mart.) Solms-Laub.	Pontederiaceae	Bilatidala	Leaf petioles, flower spikes	<ul style="list-style-type: none"> ❖ All parts were steamed and the juice is taken orally to cure diarrhoea.
43	<i>Euphorbia ligularia</i> Roxb.	Euphorbiaceae	Siju	Leaves, latex etc.	<ul style="list-style-type: none"> ❖ Dry latex and leaves were taken with goat milk to cure toothache, piles, and intestinal worms.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
44	<i>Ficus religiosa</i> L.	Moraceae	Aswatta	Root, bark, ripe fruit, branch, leaves, fruits, seed	<ul style="list-style-type: none"> ❖ The decoction of roots, bark, branches and leaves are used to treat snake venom, blood purification, itching, jaundice, and tooth problem ❖ Juice of ripen fruits (1 cup) were used in the early morning to cure gastric problems, kidney stones, and urine problems.
45	<i>Ficus rcemosa</i> L.	Moraceae	Dimiri	Bark, gum, leaves, ripe fruits, latex, root, green fruit, fresh bark	<ul style="list-style-type: none"> ❖ All the parts are used either raw or decoction for the treatment of mouth disorder, swelling years, chickenpox, bleeding diathesis, excessive hunger, dysentery, stomach pain, urinary disorder etc.
46	<i>Ficus benghalensis</i> L.	Moraceae	Baro	Root, dried yellow leaves, seed, flower, bark, latex, buds, fruits	<ul style="list-style-type: none"> ❖ The decoction of roots, bark, and flowers were used to treat bleeding piles, diarrhoea, diabetes, urinary disorders, pain due to cuts, and ulcer. ❖ Latex is used to cure wounds. ❖ Dry leaves powder (10 gm) mixed with one tablespoon of honey and take empty stomach for one month against asthma, for severe ulcers and cyst.
47	<i>Glinus oppositifolius</i> (L.) A.DC.	Molluginaceae	Pitagama	Total plant	<ul style="list-style-type: none"> ❖ The paste of total palnt is used orally for one week to cure skin diseases.
48	<i>Helianthus annus</i> L.	Asteraceae	Surjomukhi	Seed, total plant, leaves, flower, pulp, root etc.	<ul style="list-style-type: none"> ❖ Paste of all parts and oil extracted from seeds were used to control cholesterol fever, ear problem, swelling, etc.
49	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Mandara	Leaves, flowers, root, bud	<ul style="list-style-type: none"> ❖ The paste of all the parts mixed with paste of <i>Lawsonia inermis</i> for the hair treatment. ❖ The decoction of roots and buds are used to boost memorypower, cure cough, and ulcer.
50	<i>Spondias pinnata</i> L.f.	Moringaceae	Ambada	Leaf ,fruit, seed, bark, flower	<ul style="list-style-type: none"> ❖ The paste of fruits taken orally to enhance memory power and eyesight ❖ The decoction of leaf, seeds, bark and flowers is used to treat toothache, cough, cholera, piles urinary diseases, wound, and ulcer.
51	<i>Lawsonia inermis</i> L.	Lythraceae	Menjuati	Flower, leaves, root, bark	<ul style="list-style-type: none"> ❖ The paste of leaves (100gm) was used hair colouring. ❖ The decoction of bark, root and flowers used to treat burn sensation in the head, sleep, nasal bleeding, chickenpox, and jaundice.
52	<i>Lantana camara</i> L.	Verbenaceae	Naguari	Fresh laves	<ul style="list-style-type: none"> ❖ The paste of fresh leaves used externally to treat insect stings, skin eruptions, and itch of measles.
53	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Gaiso	Fresh laves	<ul style="list-style-type: none"> ❖ 5-8gm of fresh juice taken daily empty stomach against ringworm infections.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
54	<i>Laportea interrupta</i> (L.) Chew	Urticaeae	Ghodabich- uati	Seed, leaves	❖ Powder of seeds was mixed with goat milk and taken orally to one to enhance the fertility of men. ❖ The paste of leaves used to treat the wound.
55	<i>Lagenaria siceraria</i> (Molina) Standley	Cucurbitaceae	Lau	Leaves, fruit, flower	❖ All parts were used for cooking purposes which helps to treat gastric problems. ❖ Fruit juice used to reduce fat in the body.
56	<i>Magnifera indica</i> L.	Anacardiaceae	Amba	Fruit, leaves, seed, ripe fruit, branch, pulp, kernel, gum, flower, etc.	❖ The paste of leaves, seeds, branches, and flowers was used to treat hair problem, spider bite, insect bite, sunstroke, itching, for body health, pain in testicles. ❖ Juice of fruits used against diarrhoea in children, cholera, diabetes, etc. ❖ Dry powder of gums and kernel mixed with cow milk and take twice a day for 4 days to treat worms in the stomach, urinary tract infections, and constipation.
57	<i>Mimusops elengi</i> L.	Sapotaceae	Baula	Bark, fruits, branch, soft portion of tip, flower, seed	❖ The decoction of barks, branches, and flowers was used to treat diarrhoea, cleansing of the uterus, ulcers, boils, cough, mouth problem, headache, tooth problem, etc. ❖ The paste of fruits, soft tip and seeds mixed with neem oil to cure scabies, spider bit etc.
58	<i>Momordica charantia</i> L.	Cucurbitaceae	Kalara	Leaves, green fruits, ripe fruits, seed	❖ Juice of leaves, fruits mixed with <i>Piper longum</i> and take twice a day for one month to check diabetes, jaundice, menstrual cycle, and piles. ❖ The paste of seeds diabetes, cholera, skin disorder etc.
59	<i>Mimosa pudica</i> L.	Mimosaceae	Lajakulilata	Leaves, root, seed	❖ Dry powder of leaves, roots and seeds (20gm) mixed with one spoon of honey given twice a day for 5 days to cure cough, bleeding, diarrhoea, indigestion, jaundice, calculus, diabetes, non-healing wound, etc.
60	<i>Moringa oleifera</i> Lam.	Moringaceae	Sajana	Leaves, root, fruit, flower, bark, gum etc.	❖ About 100-200g leaf paste is given twice a day for 7 days to treat bronchial asthma, dog bite and high blood pressure. ❖ Fruits and flowers are streamered and juice is extracted and used to treat a broken bones. ❖ Dry powder of gum mixed with Desi ghee to cure headache and skin related problems.
61	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulasi	Total plant, leaves, tip portion of plant, seed, leaves etc.	❖ The fresh leaf (200g) is boiled with 5 cups of water and the decoction is used to cure cold, and cough. ❖ Seeds were used in the form of powder mixed with honey to treat snake bite, night blindness, vomiting, skin diseases, and typhoid. ❖ The decoction of total plant used to cure malaria fever.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
62	<i>Oxalis corniculata</i> L.	Oxaludaceae	Ambiliti	Leaves, total plant	❖ The paste of leaves or total plants mixed with rock salt and taken orally to treat headache, foul smell of mouth, tooth powder, stomach pain and burning sensation.
63	<i>Origanum vulgare</i> L.	lamiaceae	Sumita, Pukasunga	Fresh leaves root	❖ The plant extract were used 3 days in the morning time to cure abdominal pain, diarrhoea, purgation, menstrual cycle, sprain, and swelling.
64	<i>Phyllanthus fraternus</i> Webster	Eubhorbiaceae	Bhuianla	Leaves, total plant, root	❖ The plant extract is given 7 days to dissolve kidney stones, diabetes, mouth problems, and jaundice.
65	<i>Psoralia corylifolia</i> L.	Fabaceae	Bakuchi	Root, seed, leaves, seed oil	❖ The paste of roots, seeds, and leaves was mixed with pepper (2g) to treat tooth infection, diarrhoea, jaundice, piles, tumor, sterility and Infertility. ❖ Oil extracted from seeds is used to cure skin problems.
66	<i>Psidium guajava</i> L.	Myrtaceae	Pijuli	Fruits, leaves, root, bark, seed	❖ Decoction of plant parts used to treat headache, toothache, Fever, diarrhoea.
67	<i>Phaseolus vulgaris</i> L.	Fabaceae	Beam	Fruit, seed	❖ Steamed fruits and seeds used for health development.
68	<i>Raphanus sativus</i> L.	Brassicaceae	Mula	Fruit, leaves	❖ Juice of leaves/ raw fruit was taken to treat ophthalmic problems, acidity, jaundice, kidney disorders, calculus, diarrhea, etc.
69	<i>Ricinus communis</i> L.	Euphorbiaceae	Jada	Seed, leaves, root, soft buds	❖ About 50g of seed mixed with honey and taken orally to cure jaundice, skin cracks on the breast area, cough, stomach disorders, and appendicitis. ❖ The decoction of leaves, roots, and bud was used to treat piles, labor pain, uterus swelling and vaginal pain, menstrual cycle, and worm diseases.
70	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamu	Leaves, fruit, seed, root, bark	❖ Ripen fruits eaten directly which are good for diabetic patients. ❖ The decoction of leaves/seeds/roots/ bark mixed with the juice extracted from neem leaf used against Tooth problem, eye disorder, throat problem, diabetics, diarrhoea, bleeding dysentery.
71	<i>Saraca asoca</i> (Roxb.) de Wilde	Caesalpiniaceae	Ashoko	Bark, seed, flowers, branch	❖ The paste of bark/ seeds/ flower was taken cold water for the treatment vomiting, bleeding diarrhoea, Bleeding piles, leucorrhoea, Menstrual cycle, sexual vigour for women, ❖ The decoction of bark used to cure renal stones fracture.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
72	<i>Solanum virginianum</i> L.	Solanaceae	Ankranti	Fruit, root, flower, leaves, seeds	<ul style="list-style-type: none"> ❖ Fruits and leaves were fried in Desi ghee and used or one month to treat asthma and other respiratory problems. ❖ The paste of flower, roots, and seeds (5gm) mixed with 2-3 black pepper and take empty stomach for 7 days to cure pimples, hair problem, eye diseases, and mouth problem.
73	<i>Sida cordata</i> (Burm.f.) Borssum	Malvaceae	Bala	Total plant	<ul style="list-style-type: none"> ❖ The decoction (250g plant adds 1 litre water) has been taken empty stomach, twice a day for 15 day used to treat asthma, cure pain, swelling disorder, and heart diseases
74	<i>Saccharum officinarum</i> L.	Poaceae	Akhu	Stem	<ul style="list-style-type: none"> ❖ The juice is used to treat stomach pain, indigestion, jaundice, diarrhoea, typhoid fever, blood in stool, and headache.
75	<i>Solanum lycopersicum</i> L.	Solanaceae	Bilati	Fruit, leaves	<ul style="list-style-type: none"> ❖ The pulp of fruit is used to boost the immune system, mouth problem, chest disease. ❖ The paste of leaves was used externally to treat the skin problems.
76	<i>Spinacia oleracea</i> L.	Amaranthaceae	Pui	Total plant	<ul style="list-style-type: none"> ❖ The whole plant is used as food which helps to cure gastric problems and constipation.
77	<i>Tagetes erecta</i> L.	Asteracea	Gendu	Leaves, seeds, flowers, Flower Petals, total plant	<ul style="list-style-type: none"> ❖ Fresh juice of leaves (20g) used to cure ear pain. ❖ The paste of seeds, flowers, petals and whole plants used externally to treat wounds, bleeding, and other skin problems.
78	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjuna	Root, bark, leaves	<ul style="list-style-type: none"> ❖ Fresh leaves (2-3 leaf) chew directly to treat mouth-related problems. ❖ The decoction of bark and root is taken with <i>Piper longum</i> to treat heart problems, urinary disorder, ulcer, fever, and Dyspepsia.
79	<i>Toona ciliata</i> Roem.	Meliaceae	Mahalimba	Leaves, bark, flower, gum	<ul style="list-style-type: none"> ❖ Dry powder of flowers, gum, and leaves (2-3g) is taken with warm water to treat asthma, diabetes. ❖ The decoction of leaves and barks are also used against skin problems, chickenpox, wounds, and boils.
80	<i>Cascabela thevetia</i> (L.) Lippold	Apocynaceae	Kaniara	Flowers, branch, bark, root, leaves	<ul style="list-style-type: none"> ❖ The paste of all parts was used externally to treat headaches, joint pain, skin problem, itching, and snake bite.
81	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Tentuli	Leaves, seed, fruit, root, flower, bark	<ul style="list-style-type: none"> ❖ The paste of leaves, fruits (20g) mixed with salt and black pepper to treat throat inflammation, and mouth problems. ❖ The decoction of seeds, roots and flowers was taken thrice a day for 5 days to treat diarrhoea, stomach pain, and sunstroke.

TABLE 1. Cont.

Sl. No.	Scientific name	Family	Local name	Part (s)	Dosage and mode of administration
82	<i>Tabernaemontana divaricata</i> (L.) R. Br.	Apocynaceae	Tagara	Root, flower, latex, leaves	❖ The paste of roots, leaves and flowers is mixed with need oil to treat skin problems, wound, and scorpion poisoning. ❖ Fresh latex is directly used to stop bleeding.
83	<i>Vitex negundo</i> L.	Verbenaceae	Begunia	Fruit, leaves, root	❖ Leaves are crushed and apply in the body to protect against mosquitoes and other insects. ❖ The decoction of fruit and root was used against fever, warms, and urinary tract infections.
84	<i>Xanthium strumarium</i> L.	Asteraceae	Bilajatiagudi	Leaf, root, green fruit, seed	❖ The paste of all parts is used externally to cure skin related problems.
85	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Ada	Rhizome	❖ About 20gm of rhizome boiled with 200mL of milk and take twice a day for one month to cure asthma, cold, joint pain. ❖ Fresh juice (one spoon) mixed with honey to take 3 days to clear throat problems, cold and digestive power.

Conclusion

Many traditional medicines are now an accepted fact, because of better cultural acceptability, better compatibility with the human body, lesser side effect and effectiveness. Some of the plants which have medicinal property are used as food by the tribal's and the local community. The efficacy of traditional medicine cannot be judged properly, although the ethnic tribal people used these plants for curing different types of diseases. Due importance should be provided for further research on these medicinal plants for their effectiveness, side effects(complication), mode of action etc. This study concluded that even though the accessibility of the modern system of medicine for simple and complicated diseases is available, many people in the studied area still continue to depend on medicinal plants, for the treatment of different types of diseases. Considering the undisputed role played by these medicinal plants in the modern-day world in the health care system, it is of outmost importance that these should be cultivated and propagated. But due to lack of interest among the younger generation as well as their tendency to migrate to cities for lucrative jobs, the wealth of knowledge in this area is declining therefore this study needs development and documentation for the betterment of future mankind.

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conflict of interest.

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