



Medicinal Uses of Plants in Indigenous Folklore of Manapari Range in Tiruchirappalli District Tamilnadu, South India

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Authors' contributions

This work was carried out in collaboration between all authors. Authors PD and KS designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author UM managed the literature searches. Author NN managed the experimental process and author PD identified the species of plant. All authors read and approved the final manuscript.

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Short Communication

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ABSTRACT

Aim: To find out knowledge of traditional practitioners to cure various diseases in Tiruchirappalli District of Tamil Nadu, India.

Study Design: Ethnobotanical information obtained from 100 inhabitants in 2 groups of people using questionnaires, and collection of plant material by several field visits.

Place and Duration of Study: The present ethnobotanical explorations conducted in 2014 and 2015 and the surveys were conducted using questionnaire in forest areas of Manaparai Forest Range.

Results: A total of 739 species of 74 plants species belonging to 41 families and 69 genera utilized by traditional healers. Of these, maximum species belongs to Euphorbiaceae, Asclepiadaceae, and Fabaceae with 7, 6, 5, species respectively. Diseases/ailments are wide spread such as fever,

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cough, cold, kidney stone, skin diseases, wounds and toothaches. Most of the drugs preparation is from leaves and a few are from underground parts like root, rhizome, tuber, and rarely preparation from flowers and stem barks etc. Following data includes botanical name vernacular name family parts used, process of drug and details about its application. Among these plants parts used in mixture prepared according to some different formulations, leaves are abundantly used which is followed by stem and roots.

Conclusion: Information gathered from study area indicates that excellent knowledge of herbal drugs this region forest dwellers, however their incessant and progressive exposure to modernization may result in extinction of heritage of knowledge in the time. Moreover, this study will promote a practical use of botanicals and must be continuous focusing on its pharmacological validation. Further detailed assessment and compilation of ethnobotanical knowledge, chemical studies and screening for medicinal possessions will provide cost successful and dependable source of medicine for the welfare of humankind.

Keywords: Ethno botany; indigenous folklore; diseases; traditional healers; humankind; pharmacology; questionnaire.

1. INTRODUCTION

Globally 4, 20,000 flowering plants were reported and many tropical species are not yet named [1]. More than 50,000 plants have been used for medicinal purposes. India is rich in its own flora there are 17,500 species of higher plants 15,500 fungi, 2,850 bryophytes, 6,500 algae, 2,021 lichens 1,200 pteridophytes, and 64 gymnosperms, are reported. Among these 5,725 species are angiosperms, 678 bryophytes, 3,500 fungi and 1,924 algae, 466 lichens, 260 liverworts, 193 pteridophytes, 10 gymnosperms, are endemic plant species [2]. In India, 7500 species were used by the main traditional systems of medicine include Ayurveda, Unani and Siddhas are reported.

Indian subcontinent is perhaps the richest repository of traditional medicinal plants uses [3]. The country possesses an oldest method of health care based chiefly medicinal plants of diverse nature, ranging from higher plants to lower plants, from which higher than 80% of herbalism are obtained and have been utilized for 6000 -7000 years. Generally, this source of knowledge has been passed on orally to next generation without any written document [4]. These Traditional peoples have their own peculiar culture, food habit religious rites, and a treasure of knowledge of ethno medicine [5,6,7]. Traditional healers provide substantial information about the use of most of the plant parts as medicine even today, the local communities herbalism to cure a different kind of diseases. We report on the information collected from traditional practitioners to cure various diseases in Tiruchirappalli District of Tamil Nadu, India.

2. STUDY AREA

2.1 The Hills of Manaparai Range

The hill of Manaparai consists of groups of small isolated hills sometimes forming small ranges in the western portion of the Tiruchirappalli district. The hills extend westwards into the forests of Ayyalur Range of Dindigul division and towards south east into the forests of Pudukkottai district. The elevation of these hills varies from 300 m. to 800 m. This includes parts of Eastern Ghats area viz; Ayyalur Hill Reserved Forest and Semmalai Hill Reserved Forests (Fig. 1).

3. METHODOLOGY

The present ethnobotanical explorations conducted in 2014 and 2015 and the surveys were conducted using questionnaire in forest areas of Manaparai Forest Range for documentation of ethnobotanical information and collection of plant material, several field visits were undertaken. Ethno botanical information obtained from 100 inhabitants in 2 groups of people using questionnaires. Among the 100 respondents, 40 were female and 60 were males 20 peoples were aged between 20 -30 years, 20 peoples were between 31-40 years, 30 peoples were in the age range 41-50 years, 30 numbers were above 50 years old peoples. Data presented here is based on interviews from informants and 5 traditional healers (Vaithiyar) [8]. Ethno botanical information gathered was documented in data sheets prepared. For collection of plant material, local informer accompanied to authors. The collected Plants were identified by the experts and with help of

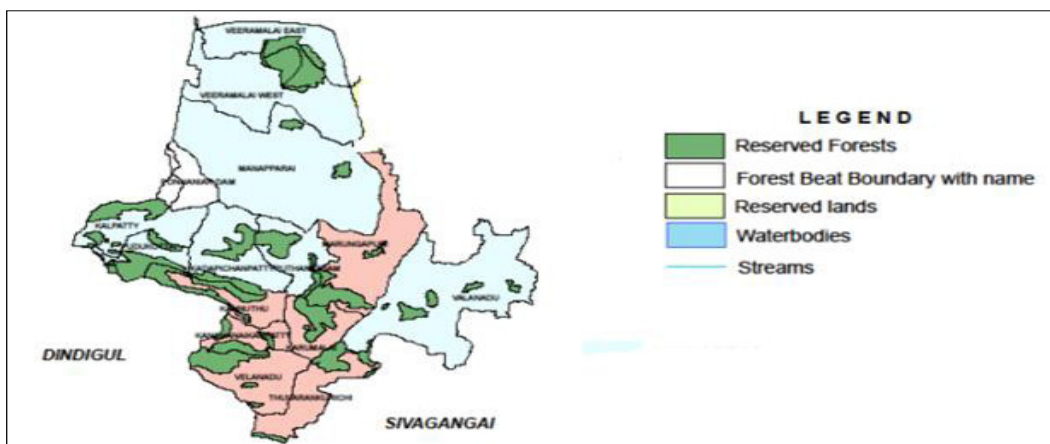


Fig. 1. Manaparai range map

different floras and available literature [9]. Herbarium specimens are deposited at the Herbarium Department of Botany, Jamal Mohamed College, Tiruchirappalli.

4. RESULTS

The survey identified and recorded 74 medicinal plants were utilized by traditional healers. Among these plants belonging 69 genera and 41 families are documented in this study. Of these, most of the species belongs to Euphorbiaceae, Asclepiadaceae, and Fabaceae with 7, 6, 5, species respectively (Table 1) following data includes scientific name of species, local name, family, and using plant part, preparation method, mode of administration and details about its application. Who has provided the information is given in digression after each use. Non-tribal informer has been put in to the category of forest dweller. Information collected from the village inhabitants of this study area have excellent knowledge of herbal medicine, however their incessant and gradually exposure to rejuvenation as a result it's going to extinction of the wealthy traditional knowledge in the course of the period. The collective efforts of pharmacognostists botanist ethno-botanists, taxonomist's phytochemists, wild life conservator and pharmacologists are needed to document and assess the effectiveness and safety of the claims. The life forms are analyzed and found that there are 26 herbs (35%), 17 shrubs (22%), 18 trees (20%) and 13 climbers (23%), out of 40 plants. Majority of medicine prepared from leaves (38), root (16), fruits (10), stem (7), bark (5), flower (4) etc. Most prevalent diseases/ailments found in the areas are skin diseases and wounds (12 plants each), 6 plants were used for kidney

stone, 6 plants for jaundice, and 3 for joint pains, etc.

5. DISCUSSION

Traditional system of medicine is deliberate the very old health care system identified to mankind on this globe. Growths of contemporary drugs, the traditional systems of medicine that have developed over the centuries within various group of people, are still sustained as a huge knowledge base in herbal drugs [10]. Knowledge of ethno medicine has been forward next generation orally without any document and also maintained the traditional knowledge by various native people in globally. Herbal plants using separately or mixed together one more plants by traditional healers. Some diseases to cure instantaneously by to prepared combinations of plants. Usually, Fresh plant part is used for the preparation of drug. When fresh plant parts are not used as simple drugs and some plants are used with a number of medicinal plant parts. The knowledge obtained from this study is in deals with the previous data [11]. The medicinal plant part used for preparation of medicine like stem, root, leaves, fruits, the whole parts of above ground, the entire plant, barks of stem, and floral parts. Hence, leaves were found most regularly used part. The information composed from the study are clearly indicates that 12 Herbal plants are used for the healing of various skin diseases like scabies, eczema and ringworms. Tirunelveli district Kani tribal were using 14 medicinal plants for the treatment of skin problems [12]. Uttar Karnataka district indigenous peoples were using 52 medicines preparation from 31 plants for skin diseases.

Table 1. Enumeration of plants used for the treatment of some common diseases by the people of study area

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
1	<i>Abrus precatorius</i> L.	Fabaceae	Kundumani	Root, leaf	Spermatogenesis	Small root pieces with 4-5 leaves taken orally three time per day its continued a week
				Leaf	Kidney stones	To prepare the leaf extract 3 to 4 tablespoons are taken orally at early morning for 15 days
				Leaf	Wounds	Leaves crushed and paste applied infected place
2	<i>Abutilon indicum</i> (L.)	Malvaceae	Thuthi	Leaf	Stomach pain	Leaves crushed with jaggary to prepare 1 g of tablets, and 3 tablets are used one time
				Leaf	Wounds	Leaves Crushed and paste applied infected place
3	<i>Acalypha indica</i> L.	Euphorbiaceae	Kupaimeni	Entire plant	Jaundice	<i>Acalypha indica</i> and <i>Momordica charantia</i> taken in 1:1 ratio and crushed juice is given 5 table spoon for adult 3 for children to continue for 10 days
4	<i>Achyranthes aspera</i> L.	Amaranthaceae	Naiyuruvi	Leaf	Ring worm scabies and itch	The crushed leaves extract can be applied
				Root	Leucorrhoea	Crushed root juice add goat milk is given orally once on alternate day for 10 -15 days
				Leaf	Wounds and cuts	Leaves crushed and paste applied infected place
5	<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	Kulapoo, sirupeelai	Seeds	Snake and dog bite	The seeds are taken orally immediately.
				Root	Tooth ache	Root is used as tooth brush
				Entire plant	Kidney stone	Whole plant crushed with cumin seeds and sugar is given orally for 10 – 15 days
6	<i>Alangium salvifolium</i> (L.f.)	Alanginaceae	Alingi	Leaf	Kidney stone	Curry of plant leaves can also be taken orally
				Stem, bark	Wounds and cuts	Dried stem bark with shade than powdered and mixed with coconut oil applied affected place
7	<i>Allium cepa</i> . L.	Liliaceae	Vengayam	Bulb	High blood pressure	Bulbs eating regularly
				Bulb	Cold	Bulbs are eaten
8	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	Ponnakanni keerai	Leaf	Eyesight improvement	The leaf juice is mixed with boiled cow milk and given in morning on empty stomach to improve the eyesight.
9	<i>Aloe vera</i> Burn.f.	Xanthorrhoeaceae	Shothu katalai	Leaf	Painful menstruation	Dried <i>Aloe vera</i> juice added with sugar and 1 g of tablets are prepared taken twice a day
				Leaf	Piles	10 g Tablets with 2.5 g sulphur powder and 2 tablets are given daily with buttermilk
10	<i>Andrographis paniculata</i> Burm.F.	Acanthaceae	Nilavembu	Leaf	Skin disease	1 spoon of leaf powder is taken with water taken orally
				Whole plant	Diabetes	Taken plant power after meal Regularly controls diabetes.
				Leaf	Viral fever & malaria	Leaves extract with pepper powder is given orally.

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
11	<i>Annona squamosa</i> L.	Annonaceae	Seetha pazham	Leaf	Tooth ache, ringworm wound sand hair lice	Leaves extract applied externally
12	<i>Asparagus racemosus</i> Willd	Asparagaceae	Thannirvitan Kilangu	Whole plant	Breast ulcer	Plant juice and cow milk taken orally 6 spoon its continued for a week
13	<i>Calotropis gigantea</i> (L.) Ait.	Asclepiadaceae	Erukku	Flower Latex Flower & Leaf	Arthritis Black marks and Pimples Head ache	Flowers warmed and tied on feet overnight Latex applied to pimples and black marks on face. Flowers and leaves are kept on fore head and warmed utensil used for messaging head.
14	<i>Cassia auriculata</i> L.	Caesalpinioideae	Avarai	Leaf, flower	Diabetes	Leaves and flower dried on shade and are given one teaspoon daily
15	<i>Cassia alata</i> (L.)	Caesalpinioideae	Thagarai	Leaf Leaf Root	Body heat Itch Ringworm	Leaf decoction 100 ml per day taken orally Leave extract applied externally Root paste with lemon juice controls ringworm.
16	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Sudukattu arali	Leaf	Anti-diabetic	4 to 6 fresh leaves eating daily.
17	<i>Cissus quadrangularis</i> L.	Vitaceae	Pirandai	Stem	Piles	1 g of stem powdered mixed with sugar taken for 2 to 3 weeks..
18	<i>Clitoria ternatea</i> L.	Fabaceae	Sangu puspam	Root	Headache	Root extracts few drops put in the nose.
19	<i>Cocculus hirsutus</i> (L.) Theob.	Menispermaceae	Kattukodi	Leaf Leaf Leaf	Headache Ringworm, wound, and cuts Spermatogenesis	Leaves extract is applied on forehead. Leaf crushed with water and applied externally Fresh leaves directly consumed.
20	<i>Crotalaria retusa</i> L.	Fabaceae	Kiluklupai	Leaf Leaf Root	Leprosy Fever	To prepared leaves extracts and taken orally 5 to 10 ml for 10 days Root extract taken orally 10 ml twice a day.
21	<i>Cynodon dactylon</i> Pers.	Poaceae	Arugampul	Whole plant Entire plant	Kidney stone Amoebiasis	Plant extract taken orally 10 -20 ml for 8 -10 days. Root prepared by mixing dry plant powder and wheat floor.
22	<i>Datura metel</i> L.	Solanaceae	Karumathai	Leaf Root Fruits	Joint pain Pimples Wounds	Leaf dipped in warmed castor oil and is applied externally. Root crushed and applied externally The fruit roasted in burning ash and then applied.
23	<i>Dendrophthoe falcata</i> (L.f.)	Loranthaceae	Kadalathi	Twig Leaf Flower	Reduce sterility Wounds Asthma	Tender twigs with <i>Ficus racemosa</i> bark powder crushed than added to goat milk is taken orally 20 -30 ml. Crushed leaves applied externally 1 g of flower paste and added to 1 g honey and taken orally for 8 – 10 days
24	<i>Diplocyclos palmatus</i> (L.) C. Jeffrey.	Cucurbitaceae	Lingam kai	seed	Promote fertility	20 g of seeds taken orally one time per day for 10 -15 days.

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
25	<i>Dodonea viscosa</i> (L.) Jacq.	Sapindaceae	Virali	Leaf	Bone fracture	Leaves, turmeric and oil crushed together and applied.
26	<i>Eclipta prostrata</i> (L.) L.	Astaraceae	Kanjankorai	Leaf	Joint pain	Fresh leaves are boiled and applied externally.
27	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Nelli	Leaf	Jaundice	Leaf curry is useful to purify the blood
28	<i>Euphorbia heterophylla</i>	Euphorbiaceae	Gamalkota	Whole plant	Hair diseases	Plant boiled with gingelly oil than used as a hair oil
29	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Amman pacharisi	Fruits	Anti-allergic	Fruits and jaggary 1:1 ratio proportion crushed and taken orally
30	<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Visnu kiranthi	Fruits	Digestive	Fresh fruits taken orally.
				Leaf	Constipation	Eating leaf curry.
				Leaf	Wounds and mouth ulcers	Leaves crushed and applied directly
				Whole plant	Cough, cold,	Plant decoction taken orally 2-3 times a day to cure cough and cold.
				Root	Fever	<i>Evolvulus alsinoides</i> , <i>Andrographis paniculata</i> , and <i>Adhatoda zeylanica</i> roots are dried, then powdered administered 2-3 times a day
31	<i>Ficus benghalensis</i> L.	Moraceae	Alamarum	Latex	Sterility	Latex mixed with turmeric powder and tablets prepared dry dates taken out and plant latex is filled kept overnight and taken 2 fruits daily for about 15 days to promote spermatogenesis and reduce sterility.
				Prop roots	Tonic for children	Tender prop roots are useful as tonic for children.
				Latex	Foot cracks	Latex is useful to cure foot cracks.
32	<i>Ficus hispida</i> L.	Moraceae	Peiathi	Stem bark	Menorrhagia	Stem bark powder 2-3 g taken twice a day for a week
				Stem bark	Piles	Taken stem bark powder two times per day for 10-12 days
				Stem bark,	Leucoderma	2 g of tablets are prepared by using stem bark powder with leaf juice and taken two times per day for 7 weeks.
				Leaf		
33	<i>Gloriosa superba</i> L.	Colchiaceae	Kalapai Kilangu	Stem	Wounds	Crushed stem applied externally
				Entire plant	Lice in hair	Plant powder applied externally
34	<i>Gossypium herbaceum</i> L.	Malvaceae	Paruthi	Leaf	Wounds caused by rat bite	Crushed leaves with rice washed water (locally known as 'Kalneer') and applied
				Fruits	Kidney stones	Fruits heat in burning ash after that, extract of fruit taken orally
35	<i>Gymnema sylvestre</i> (Retz.) R.Br. ex	Asclepiadaceae	Siru kurunjan	Leaf	Conjunctivitis	Fresh leaves taken orally
36	<i>Hemidesmus indicus</i> (L.) Schult.	Asclepiadaceae	Nannari	Root	Tonic and cooling	Root boiled in water or milk and taken orally
37	<i>Jatropha gossypifolia</i> .	Euphorbiaceae	Adali	Fruits	Teeth problem	Fruit powder is applied
38	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Udian	Bark	Bone fracture	Bark is used as a bandage

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
39	<i>Lawsonia inermis</i> L.	Lythraceae	Maruthani	Leaf	Tuberculosis	Tender leaves one hand and added 7 pepper seed then crushed and taken early morning daily for 3 weeks
40	<i>Leucas aspera</i> (L.) R.Br. ex Vatke	Limniaceae	Thumabai	Leaf	Cold and fever	Taken 20 ml of leaves extract with equal amount of cow milk.
41	<i>Mangifera indica</i> L.	Anacardiaceae	Mamarum	Leaf	jaundice	50 g of leaves are crushed well water is given orally once a day for 5 - 8 days.
				Stem bark	Cooling	10 -20 ml of bark extract given orally.
				Leaf	Muscle pain	Leaves crushed and applied topically.
				Stem bark	Loose motion	Bark extract with water and sugar is prepared and given thrice a day.
42	<i>Martynia annua</i> L.	Martyniaceae	Thelkodukku	Leaf	Sore throat	Leaf decoction gargle two times per day.
				Fruits	Scorpion sting	Fruit crushed and applied.
43	<i>Momordica charantia</i> L.	Cucurbitaceae	Paharkai	Leaf	Piles	Fruit or leaves is added sugar and given orally twice in a day regularly till cure.
44	<i>Moringa oleifera</i> Lam.	Moringaceae	Murungai	Leaf	Spermatogenesis	Curry of leaves and fruits eaten to promote.
45	<i>Mukia maderaspatana</i> (L.) M. Roemer	Cucurbitaceae	Musumusukai	Root	Toothache	Crushed root used as toothpaste
				Leaf,	Pitham, stimulation	Leaf extract used against pitha leave juice mixed with food given for body stimulation
46	<i>Murraya koenigii</i> (L.) Spr.	Rutaceae	Karuvepilai	Leaf	Diarrhea	15 ml of leaf decoction taken thrice a day
47	<i>Ocimum basilicum</i> L.	Lamiaceae	Thiruneetrapachilai	Leaf	Earache	Leaf juice 3-5 drops put in to the ear.
				Seed	cooling	Seeds are taken one teaspoon and soaked in water and given orally.
48	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Tulasi	Leaf	Cough, fever and skin disease	Leave extract orally.
49	<i>Oxalis corniculata</i> L.	Oxalidaceae	Puliarai	Entire plant	Wounds	Plant paste applied affected place
				Whole plant	Teeth pain	Leaf decoction gargle two times per day.
				Whole plant	Scorpion sting	Plant paste applied affected place
50	<i>Pedaliium murex</i> L.	Pedaliaceae	Yanai Nerungil	Whole plant	kidney stones and urinary problems	Whole plant dipped in to 500 ml pure water and kept for 15 minutes. The water changed like viscous fluid and added sugar take orally
				Seed	kidney stones and urinary problems	Dry seed powder it taken with water orally
51	<i>Phyllanthus niruri</i> L.	Euphorbiaceae	Keelanelli	Leaf	Cooling	Leaves, cumin seeds and sugar, crushed with water and taken orally 30 - 40 ml.
				Whole plant	Laxative	Plant extract taken orally
				Entire plant	Jaundice and leucorrhoea	Crushed plant prepared as a tablets are, taken daily twice for 2 weeks.

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
52	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Chithramulam	Leaf Root Entire plant	Pimples Fever Loss motion	Leaf paste applied for affected place Roots paste applied on back bone reduce fever Plant crushed with ghee and taken orally
53	<i>Pongamia pinnata</i> (L.) Pierre.	Fabaceae	Pungamaram	Stem	Tooth ache	Stem is used as toothbrush.
54	<i>Psidium guajava</i> L.	Myrtaceae	Koiya	Leaf	Diabetes	Leaves dipped soaked in water for overnight and taken early in the morning.
55	<i>Punica granatum</i> L.	Punicaceae	Madulai	Bark & root	Cooling	Prepared sarbat by root and stem bark
56	<i>Randia dumetorum</i> (Retz.) Poir.,	Rubiaceae	Madukarai	Whole plant Flower	Dog bite Hair fall	Whole plant crushed and taken orally. Flowers paste are applied in hair.
57	<i>Ricinus communis</i> L.	Euphorbiaceae	Amanakku	Seed oil	Constipation	<i>Ricinus</i> oil, honey and dry <i>Zinger</i> powder taken in to equal proportion and crushed to prepare a liquid solution. One teaspoonful taken orally.
58	<i>Sapindus emarginatus</i> Vahl.	Sapindaceae	Ponthikottai	Fruits Bark	Hair tonic Antidote to poison and animal bite.	Crushed fruits applied in hair than washed. Stem bark powder with water taken orally
59	<i>Sarcostemma intermedium</i> (L.) R.Br.	Asclepiadaceae	Kodikalli	Entire plant	Bone fracture	100 g plant crushed and taken with 100 ml of goat milk applied for a week.
60	<i>Sida rhombifolia</i> L.	Malvaceae	Aruvalmanipoondu	Whole plant Whole plant Root	Cooling Tonic Leucorrhoea	Fresh plant taken orally. Plant powder 20 g add to 100 ml of milk taken orally Root powder 20 g, sugar 10 g and 100 ml of water taken orally.
61	<i>Solanum nigrum</i> L.	Solanaceae	Manathakkali	Fruits Leaf Leaf	Liver infection Night blindness Joint pain	Fruits are taken orally Curry made of leaves. Crushed leaves applied directly
62	<i>Solanum virginianum</i> L.	Solanaceae	Kandangkathiri	Leaf Fruits Flower Root	Ring worm Hair fall in patches & hair Cough Kidney stone	Crushed leaves with turmeric powder and applied. Fruits with <i>Hibiscus</i> flowers made into paste and applied Dry flower powder is mixed with honey is given orally two time per day. Root powder is added to butter milk and it is taken early morning before eating for a week.
63	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Navel	Fruits Stem bark Leaf	Kidney stone Stomach pain Teethache bleeding gums	Fruits directly eaten. Stem bark with common salt crushed and taken orally. Gargling of leaf extract
64	<i>Tabernaemontana divaricata</i> (L.) R.Br	Apocynaceae	Nanthiavattai	Root	Body heat	Root powder taken orally
65	<i>Tectona grandis</i> L.f.	Verbenaceae	Thekku	Bark	Cramps and rheumatism	Stem bark powder is warmed with water and taken orally 2 ml.

Sr. no	Botanical name	Family name	Vernacular name	Part used	Disease	Mode of administration
66	<i>Tephrosia purpurea</i> (L.) Pers	Fabaceae	Kolingi	Whole plant Root	Liver disease, paralysis Tooth ache	Dry plant powder with curd taken orally 25 ml. Root is used as toothbrush.
67	<i>Terminalia arjuna</i> Roth.	Combretaceae	Neermaruthu	Bark	Chest pain	Dry bark powder mixed with water two times per day for week.
68	<i>Tinospora cordifolia</i> (Willd.) Miers ex	Menispermaceae	Seenthil Kodi	Leaf Leaf Leaf	Health tonic Jaundice Fever	Fresh leaves extract taken early morning. Fresh leaves extract with honey taken orally. Fresh leaves extract with honey taken twice a day for 3 days.
69	<i>Trianthema portulacastrum</i> L	Aizoceae	Saranai	Leaf	Jaundice	Leaf extract with 50 ml buttermilk are taken orally.
70	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Nerungil	Fruits Entire plant	Kidney stone Arthritis rheumatism	Dry fruit powder 5 g boiled with milk taken orally for couple of weeks. Plant 5 g ginger crushed in 30 ml water taken twice a day for 2 weeks.
71	<i>Tylophora indica</i> (Burn. F) Merr.	Asclepiadaceae	Nanch aruppan	Whole plant Leaf Leaf	Antitoxic Loose motions Cough and cold	Fresh plant extract is taken orally 25 ml leaf extract taken orally two times per day Leaves boiled with milk and taken twice.
72	<i>Vitex negundo</i> L.	Verbenaceae	Nochi	Root Leaf Leaf	Joint pain Body pain Ring worm and itch	Root extracts 50 ml taken orally two times per day. leaves boiled in water and then take bath Leaf paste applied
73	<i>Wattakaka valubilis</i> (L.f.) Stapf	Asclepiadaceae	kodipalai	Leaf	Snake bite	Single leaf with 4 pepper and <i>Achyranthes aspera</i> extracts taken 50 ml thrice to treat snake bite. Three doses are to be given after the interval of half an hour.
74	<i>Wrightia tinctoria</i> RBr	Apocynaceae	Veppalai	Root	Epilepsy	50 ml of root decoction was given to orally.

Indigenous people of Sikkim have been utilized 37 plants of plants as antidiabetic agents [13]. The present study revealed that 12 plants used by peoples for healing of wounds. Many studies have been reported with plants for wound healing and skin diseases worldwide [14]. Madhya Pradesh tribals used 13 plants for jaundice treatment [15]. In the present study identified that the species of *Acalypha indica*, *Evolvulus alsinoides*, *Trianthema portulacastrum* *Leucas aspera*, *Tinospora cordifolia*, *Phyllanthus niruri* and *Eclipta prostrata* are used for jaundice healing. The study area forest dwellers have been used 6 medicinal plants for kidney stone. To test the scientific validity of the herbal preparations or drugs, clinical studies are required, which can establish therapeutic properties of these preparations for safe use.

6. CONCLUSION

The knowledge of information shows that majority of the remedies are in use orally few drugs applied externally for skin diseases. Traditional healers have been prepared the medicines prepared from single part of the plant or a combination of plant parts. Mostly single plants are used for preparation of medicine, combination of plants parts are used rarely. Always used fresh plant parts some time when fresh plant parts are unavailable, dried parts are also used. Generally, the forest dwellers still have a strong belief in the efficacy and success of herbal medicine. The present study provides evidence that herbal plants continue to play in significant role in the healthcare system of this group of people, and also ethnobotanical knowledge of the medicinal plants used by the ethnic people to cure several diseases. Moreover, this study will promote a practical use of botanicals and must be continuous focusing on its pharmacological validation. Further detailed assessment and compilation of ethno botanical knowledge, chemical studies and screening for medicinal possessions will provide cost successful and dependable source of medicine for the welfare of humankind.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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