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Ethnobotanical survey of medicinal plants used by Malayali tribes in Jawadhu hills of Eastern Ghats, Tamilnadu, India

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ABSTRACT

An ethnobotanical survey was carried out to collect information from the Malayali tribes of Jawadhu hills, Thiruvannamalai district, Tamilnadu, India from August 2016 to July 2017. A total of 63 plant species belonging to 32 families were distributed into 55 genera, which were commonly used by the local Malayali tribes for the treatment of various diseases such as headaches, fevers, asthma, coughs, colds, wounds, snake bites, piles, stomach disorders, skin diseases, gastric ulcers, kidney stones, urinary infection, diabetes, jaundice, inflammation etc. In the present study, Acanthaceae, Euphorbiaceae, Amaranthaceae, and Asclepiadaceae are the most dominant families used in the treatment of various ailments. Generally, leaves are used to prepare herbal medicine. The ethnomedicinal plants used by the Malayali tribes were arranged alphabetically followed by botanical name, family, local name, medicinal uses and mode of administration.

KEYWORDS: Ethnobotany, medicinal plants, Malayali tribes, Jawadhu hills, medicinal uses

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INTRODUCTION

Ethnobotany deals with the study of relationships between humans and indigenous plants. Plants are an important source in the preparation of herbal drugs and play a significant role in the survival of tribal and indigenous people throughout the world. According to the World Health Organization (WHO), it is estimated that more than 80% of the world population relies on traditional medicines, mostly plant drugs, for their healthcare needs (Kala *et al.*, 2006). In developed countries, 25% of herbal medicines are used to treat chronic as well as infectious diseases. The indigenous people in rural areas have a vast knowledge of how to use plants for the treatment of various diseases. In India, about 1.5 million indigenous people use plant drugs as a traditional medicine for preventive and curative purposes. The tribes and indigenous peoples in India use more than 6,000 of 15,000 herbal plant species as herbal medicine (Dhamija *et al.*, 2011).

The tribal and indigenous people have a strong faith in herbal native traditional medicine to cure diseases. Generally, every tribal group has a wide range of ethno-medicinal knowledge for the identification of medicinal plants and also has a unique and different technique for using these herbs for the treatment of various diseases. In India, some tribal groups have started to

use allopathic medicine along with ethnomedicine. But still, there is a lack of documentation of indigenous knowledge of herbal medicine. So awareness should be created among the tribal and indigenous people to explore their ethnomedicinal knowledge for the treatment of diseases. The current study aimed to document indigenous knowledge on medicinal plant species used by local Malayali Tribes in the Jawadhu Hills, Thiruvannamalai district, Tamilnadu, India.

MATERIALS AND METHODS

Study Area

Jawadhu Hills are located in the Southern Eastern Ghats, spread over Vellore and Tiruvannamalai districts of Tamil Nadu. The Jawadhu Hills cover an area of 80 km wide and 32 km long. It is bisected into western and eastern parts by three major rivers, viz., Cheyyar, Agaram, and Palar. The altitude of the Jawadhu Hills ranges from 1100 m to 1150 m above mean sea level. It is located between 12.5833° N latitude and 78.8333° E longitude. Jawadhu Hills is a humid subtropical climate area mainly occupied by Malayali tribes (98%) and others (2%). The vegetation of the study area falls under the moist and dry deciduous forest types (Figure 1).

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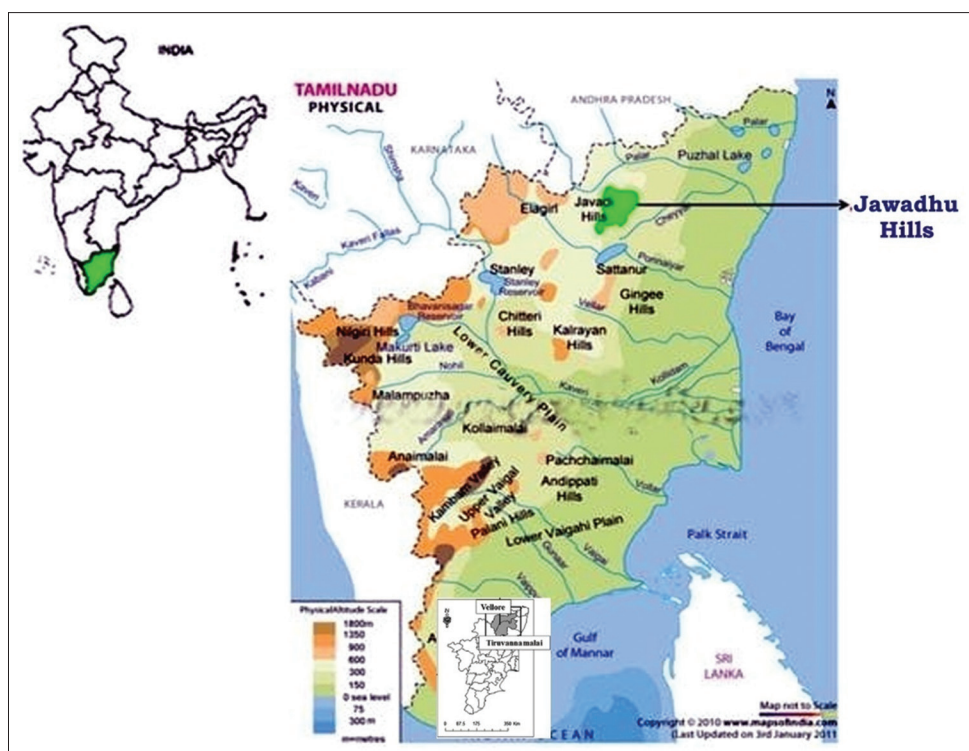


Figure 1: Location map of the Jawadhu hills

Data Collection

An extensive field survey was carried out to get information on the medicinal plants from the Malayali tribes in the study area. In order to document the existing information on the medicinal plants from tribal practitioners, several field trips were carried out from August, 2016 to July, 2017 in the Jawadhu Hills. During the study, the ethnomedicinal information was collected from middle-aged and older tribal practitioners in their local language, Tamil, through direct interviews, questionnaires and discussions.

The information on the local name of the plant, parts of the plant used, method of preparation and mode of administration (*i.e.*, paste, powder, juice and decoction) of all collected ethnomedicinal plants was recorded during the survey period. The collected ethnomedicinal plants were identified by using The Flora of the Presidency of Madras (Gamble, 1935) and The Flora of Tamil Nadu Carnatic (Matthew, 1983). Further, the identification was confirmed by referring to authentic specimens deposited at the Botanical Survey of India, Southern Circle, Coimbatore.

RESULTS AND DISCUSSION

The present study revealed that a total of 63 plant species belonging to 32 families were distributed into 55 genera, which were commonly used by the local Malayali Tribes for the treatment of various diseases. The most commonly represented families were Acanthaceae (8 species), followed by Euphorbiaceae (5 species), Amaranthaceae and Asclepiadaceae (4 species each), and the remaining 28 families were represented

by less than 4 species in the study forest, Jawadhu Hills. The most represented genera are *Cassia* (3), *Achyranthes*, *Barleria*, *Euphorbia*, *Phyllanthus*, and *Sida* (2) in the studied plants (Table 1).

Tribes are using these plants to cure diseases like headaches, earaches, sore throats, fevers, viral fevers, asthma, cough, cold, blockage of nose, wounds, snake bites, insect bites, scorpion stings, antidotes, piles, gonorrhea, stomach aches, stomach disorders, psoriasis, skin diseases, ringworm, gastric ulcer, kidney stone, urinary infection, antiseptic, gallstones, arthritis, diabetes, wheezing, ulcers, joint pains, inflammation, rheumatism, infection fingers, traumatic, folkloric, hair growth, diabetes, leucoderma, jaundice, leprosy, anti-fertility, bronchitis, tooth diseases, antidepressant, dyspepsia, and eye inflammation. The different parts of plants were used to prepare medicines in the form of paste, powder, juice, decoction, and oil. Further, it was observed that some of the plants were used in more than one form of mode of preparation (Table 1).

Among the different parts of the plant used, leaves (43.41%) were most frequently used in the preparation of medicine followed by whole plant (21.20%), root (11.10%), leaf and root (8.8%), fruit (3.3%), flower, inflorescence, seed, tuber, rhizome, leaf and flower, leaf and seed, root and flower, leaf and seed, root and flower, leaf and seed, root and flower, leaf, root, fruit and seed with 2.2% (Figure 2). Xavier *et al.* (2014) reported that leaves are mostly recommended for the preparation of ethnomedicine. The most frequently used method of preparation was paste (27.26), followed by powder (17.17%), decoction, juice (11.11% each category), paste and juice (8.8%), paste and powder (6.6%), decoction and juice,

Table 1: Ethnomedicinal plants, local name, mode of administration and uses in Malayali Tribes of Jawathu hills, Tamilnadu.

S.No.	Species	Family	Local Name	Parts used	Medicinal uses	Mode of administration
1	<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppaimeni	Leaf	Headache, wound	Paste, juice
2	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	Nayurivi	Inflorescence	Insect bites.	Paste
3	<i>Achyranthes bidentata</i> Blume	Amaranthaceae	Sennaiyuruvi	Whole plant	Asthma, antidote	Paste
4	<i>Aerva lanata</i> (L.) Juss.ex.Shut.	Amaranthaceae	Sirupeelai	Root	Piles	Paste
5	<i>Ageratum conyzoides</i> Linn.	Asteraceae	Appakkoti	Leaf	Psoriasis	Paste
6	<i>Alternanthera pungens</i> Kunth.	Amaranthaceae	Ottaramul, Thevadiyalmul	Leaf	Gonorrhea	Decoction
7	<i>Alysicarpus monilifer</i> (L.) DC	Fabaceae	Kasukkoti	Leaf	Stomach ache, fever, skin diseases	Paste
8	<i>Ammannia baccifera</i> L.	Lythraceae	Kall-uruvi	Leaf	Rheumatism, ringworm	Paste
9	<i>Andrographis paniculata</i> (Burn.F) Wall.ex.Nees.	Acanthaceae	Nilavembu	Leaf, root	Snake bite and fever\	Paste, decoction
10	<i>Anisochilus carnosus</i> (L.f.) wall	Lamiaceae	Karppura-valli	Whole plant	Gastric ulcer, skin diseases	Paste
11	<i>Asparagus racemosus</i> Willd.(L.)	Asparagaceae	Thaneervitaan Kizhangu	Tubers	Kidney stone	Paste, powder
12	<i>Barleria buxifolia</i> (L.)	Acanthaceae	Rose mullippoondur	Leaf	Viral fever, urinary stomach disorders	Juice
13	<i>Barleria prionitis</i> Linn.	Acanthaceae	Kattukanagambaram	Whole plant	Urinary infection, fever	Decoction, juice
14	<i>Bidens pilosa</i> Linn.	Asteraceae	Mukkuthi	Leaf	Antiseptic	Paste
15	<i>Biophytum sensitivum</i>	Oxalidaceae	Tintanali	Leaf	Bite poisoning, wound	Paste
16	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Mookkaratti	Root	Asthma, sugar in urine	Decoction
17	<i>Borreria hispida</i> (L.) K. Schum.	Rubiaceae	Nattai-churi	Leaf	Gallstones, headache	Decoction
18	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Mudakathaana	Leaf	Cough, piles, arthritis, joint pains	Decoction
19	<i>Cassia occidentalis</i> L.	Caesalpineaceae	Narattantakarai	Leaf, root, fruit, seed	Rheumatism, digestive, diabetes, wheezing, cough, cold	Decoction of Leaf, leaf paste, root power, juice
20	<i>Cassia tora</i> L.	Caesalpineaceae	Thakarai	Leaf, seed	Skin disease	Paste, power
21	<i>Cassia hirsuta</i> L.	Caesalpineaceae	Malaiyavarai	Leaf, root	Kidney disorders, Skin disease	Paste, juice
22	<i>Cissus quadrangularis</i> L.	Vitaceae	Pirantai	Whole plant	Bone fracture, wound digestive	Root and stem paste, leaf juice
23	<i>Coccinia indica</i> Wight & Arn.	Cucurbitaceae	Kovai	Leaf	Asthma, earache, ulcer	Juice
24	<i>Cocculus hirsutus</i> Linn	Menspermiaceae	Kattu-k-koti	Leaf, root	Fever, skin diseases, stomach disorders	Paste, decoction
25	<i>Commelina benghalensis</i> L.	Commelinaceae	Kanavazhai	Leaf	Sore throat, burns, pain, inflammation	Decoction
26	<i>Crotalaria verrucosa</i> Linn.	Fabaceae	Kilukilippai	Whole plant	Fever, stomach pains.	Paste, juice
27	<i>Croton sparsiflorus</i> Morong	Euphorbiaceae	Reilpoondur	Seed	Malaria.	Powder
28	<i>Cyanotis arachnoidea</i> Clarke	Commelinaceae	Nirupalli	Root	Rheumatics	Decoction
29	<i>Cymbopogon citratus</i> (DC) Stapf.	Poaceae	Vasanapullu	Leaf	Anti periodic	Leaf extract
30	<i>Daemia extensa</i> (Jacq.) R. Br. Ex Schult.	Asclepiadaceae	Veliparuthi	Leaf	Cold, Cough, fever, asthma	Juice
31	<i>Euphorbia heterophylla</i> Linn.	Euphorbiaceae	Paal perukki	Leaf	Traumatic, folkloric	Paste
32	<i>Euphorbia hirta</i> Linn.	Euphorbiaceae	Ammam Paccharisi	Leaf	Snake bites	Decoction
33	<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Vishnukranthi	Whole plant	Hair growth, fever	Paste, juice
34	<i>Gloriosa superba</i> L.	Liliaceae	Kannuvelli	Rhizome	Snake bites, scorpion stings.	Paste, power
35	<i>Gymnema sylvestre</i> (Retz.) R. Br.ex. schutt.	Asclepiadaceae	Sirukurinjan	Leaf	Diabetes	Powder
36	<i>Hemidesmus indicus</i> (L) R. Br. In Aiton	Asclepiadaceae	Nannari	Root	Leucoderma	Paste
37	<i>Impatiens balsamina</i> L.	Balsaminaceae	Kaci-t-tumpai	Flower	Tonic	Powder
38	<i>Ionidium suffruticosum</i> Ging.	Violaceae	Orilaiththamarai	Leaf, root	Diuretic, scorpion sting.	Decoction, Juice
39	<i>Ipomoea staphylinia</i> Roem. & Schult.	Convolvulaceae	Onaankodi	Leaf	Stomach disorders, pain, inflammation	Paste
40	<i>Justicia tranquebariensis</i> L.f.	Acanthaceae	sivanervembu	Leaf	Jaundice, Skin aliments	Paste, juice

(Contd...)

Table 1: (Continued).

S.No.	Species	Family	Local Name	Parts used	Medicinal uses	Mode of administration
41	<i>Leptadenia reticulata</i> (Retz.)	Asclepiadaceae	Palaikkodi	Leaf	Leprosy, tonic and stimulant	Leaf extract
42	<i>Leucas aspera</i> (Wild). Link, Enum.	Lamiaceae	Thumbai	Leaf, flower	Snakebite, Scorpion bite, blockage of nose, head ache.	Juice
43	<i>Mimosa pudica</i> L.	Mimosaceae	Thotta Surungi	Root	Anti fertility, wounds	Paste, decoction
44	<i>Mollugo pentaphylla</i> L.	Molluginaceae	Seeragappoondur	Leaf	Cooling purpose, urinary troubles	Juice
45	<i>Oldenlandia umbellata</i> L.	Rubiaceae	Saayavaer	Leaf, root	Asthma, bronchitis	Paste
46	<i>Oxalis corniculata</i> Linn	Oxalidaceae	Puliyarai	Leaf	Astringent, antiseptic and anemia	Leaves cooked food
47	<i>Passiflora foetida</i> L.	Passifloraceae	Mosukkattan	Leaf	Cough	Powder
48	<i>Pavonia zeylanica</i> (L.) Cav.	Malvaceae	Mammatti	Whole plant	Skin problems, ringworm, rheumatism	Paste, powder
49	<i>Peristrophe bicalyculata</i> (Retz) Nees	Acanthaceae	Chebira	Whole plant	Bone fracture-sprains	Powder, juice
50	<i>Persicaria chinensis</i> (Linn) H.Gross	Polygonaceae	Erumainakkuchedi	Root	Diarrhoea	Powder
51	<i>Phyllanthus virgatus</i> G.Forst	Phyllanthaceae	Patar nelli	Whole plant	Bleeding	Powder
52	<i>Phyllanthus maderasptensis</i> L.	Euphorbiaceae	Nila-nelli	Fruit	Teeth diseases	Powder
53	<i>Plantago erosa</i> Wall.	Plantaginaceae	Ishappukul vitai	Leaf	Antiseptic, gastric troubles	Powder
54	<i>Polygonum glabrum</i> Willd.	Polygonaceae	Sivappu Kumbakodaali	Whole plant	Antimicrobial, antidepressant	Juice
55	<i>Ruellia prostrata</i> Poir.	Acanthaceae	Pottakanchi	Whole plant	Diabetes	Juice
56	<i>Sida acuta</i> Burm F.F.I.	Malvaceae	Vattatirippi	Leaf	Wound	Paste
57	<i>Sida cordifolia</i> L.	Malvaceae	Arivalmanaippundu	Root	Refrigerant	Paste
58	<i>Smilax aspera</i> Linn.	Smilacaceae	kizhanna	Whole plant	Intestinal diseases	Powder
59	<i>Stachytarpheta indica</i> L.	Verbenaceae	Seemai nayuruvi	Whole plant	Fever	Powder
60	<i>Strobilanthes foliosa</i> T. Anderson	Acanthaceae	Neela Kurinchi	Leaf	Antiseptic	Paste
61	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Kattukolingi	Root, flower	Dyspepsia, eye inflammation	Decoction, juice
62	<i>Toddalia asiatica</i> (L) Lam.	Rutaceae	Kattumilaku	Fruit	Fever, wound, cough	Powder
63	<i>Xanthium strumarium</i> L.	Asteraceae	Marul-umattai	Leaf	Infection fingers	Paste

paste and decoction (5.5% each category), leaf extract (3.3%), leaves cooked food, powder and juice, paste and juice, decoction, paste, power and juice with 2.2% (Figure 3). The most utilized form of medicine was paste and it was mentioned earlier by Upadhyaya *et al.*, 2012.

In the present investigation, more than one plant was used for the treatment of the same disease. For example, *Alysicarpus monilifer*, *Andrographis paniculata*, *Barleria buxifolia*, *Barleria prionitis*, *Cocculus hirsutus*, *Crotalaria verrucosa*, *Daemia extensa*, *Evolvulus alsinoides*, *Stachytarpheta indica*, *Toddalia asiatica* (fever), *Alysicarpus monilifer*, *Anisochilus carnosus*, *Cassia tora*, *Cassia hirsuta*, *Cocculus hirsutus*, *Justicia tranquebariensis*, *Pavonia zeylanica* (Skin disease), *Acalypha indica*, *Biophytum sensitivum*, *Cissus quadrangularis*, *Sida acuta*, *Toddalia asiatica* (wound), *Cardiospermum halicacabum*, *Cassia occidentalis*, *Daemia extensa*, *Passiflora foetida*, *Toddalia asiatica* (cough). Likewise single plant is used for more than one disease, for example *Leucas aspera* (snakebite, Scorpion bite, blockage of nose and head ache), *Cassia occidentalis* (rheumatism, digestive, diabetes, wheezing, cough and cold), *Cardiospermum halicacabum* (Cough, piles, arthritis and joint pains), *Alysicarpus monilifer* (stomach ache, fever and skin diseases), *Barleria buxifolia* (viral fever, urinary and stomach disorders), *Oxalis corniculata* (Astringent, antiseptic

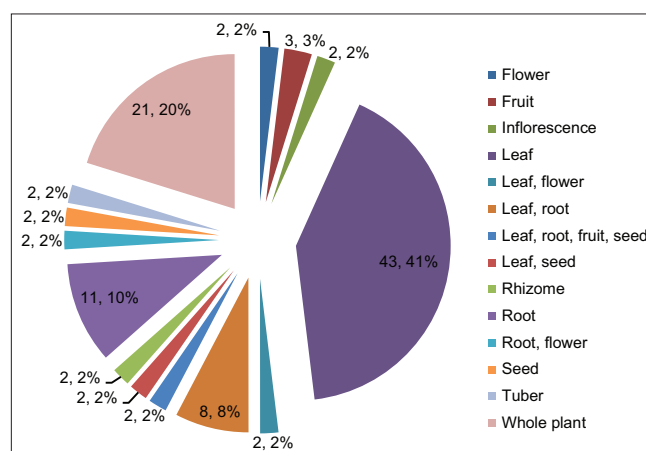


Figure 2: Percentage of plant parts used for the preparation of medicine

and anemia), *Pavonia zeylanica* (Skin problems, ringworm and rheumatism), *Toddalia asiatica* (fever, wound and cough), *Cocculus hirsutus* (Fever, skin diseases and stomach disorders), *Commelina benghalensis* (sore throat, burns, pain and inflammation), *Cissus quadrangularis* (bone fracture and wound digestive) *Acalypha indica* (headache and wound), *Achyranthes bidentata* (asthma and antidote) and *Gloriosa*

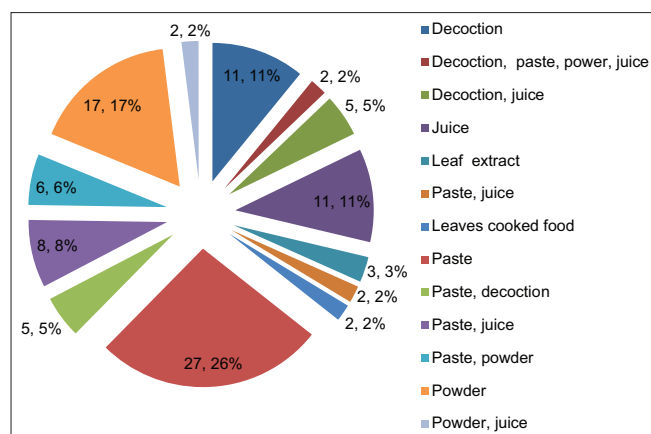


Figure 3: Percentage of mode of preparation

superba (Snake bites and scorpion stings). Similarly, single plant is used to treat multiple diseases such as *Leucas aspera* (snake bite, Scorpion bite, nose blockage, and headache), *Cassia occidentalis* (rheumatism, digestive, diabetes, wheezing, cough, and cold), *Cardiospermum halicacabum* (Cough, piles, arthritis and joint pains), *Alysicarpus monilifer* (stomach ache, fever and skin diseases), *Barleria buxifolia* (viral fever, urinary and stomach disorders), *Oxalis corniculata* (Astringent, antiseptic and anemia), *Pavonia zeylanica* (Skin problems, ringworm and rheumatism), *Toddalia asiatica* (fever, wound and cough), *Cocculus hirsutus* (Fever, skin diseases and stomach disorders), *Commelina benghalensis* (sore throat, burns, pain and inflammation), *Cissus quadrangularis* (bone fracture and wound digestive) *Acalypha indica* (headache and wound), *Achyranthes bidentata* (asthma and antidote) and *Gloriosa superba* (Snake bites and scorpion stings). Several ethnobotanical studies have reported the use of plants for fever, cough, cold, asthma, headache, piles, skin diseases, wounds, diabetics and stomach disorders in different parts of India (Manickam *et al.*, 2004; Ayyanar and Ignacimuthu, 2005; Ragupathy *et al.*, 2008; Singh and Bharti, 2015; Singh *et al.*, 2017; Raghuvanshi *et al.*, 2021).

CONCLUSION

The present investigation was aimed to record the ethnomedicinal knowledge of plants used for the treatment of various diseases by the Malayali tribes of Jawadhu hills. Medicinal plants still play a major role in the primary health care of the tribes. The Malayali tribes of the Jawadhu hills have been using several medicinal plants for therapeutic purposes. The tribes depend on these plants for the treatment of various diseases such as headaches, fevers, asthma, coughs, colds, wounds, snake bites,

piles, stomach disorders, skin diseases, gastric ulcers, kidney stones, urinary infections, diabetes, jaundice, inflammation etc. Furthermore, it is also observed that some medicinal plants in that area are destroyed. So there is a need to create awareness among tribes for documentation, sustainable utilization and conservation of such medicinal plants.

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