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Ethno-Medico-Botanical Studies of Plant Resources of Hoshangabad District, Madhya Pradesh, India: Retrospect and Prospects

Research Article

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Abstract

The present communication reports the folk medicinal uses of plants by the tribes of Hoshangabad District, Madhya Pradesh (India), which are therapeutically used against different ailments of human being as well as the livestock. In all, 179 plant species comprising 47 trees, 36 shrubs/undershrubs, 74 herbs, 21 climbers and 1 liana belonging to 76 families, used by the tribal people, have been enumerated and discussed, which signifies the ethnomedicinal values of plant species occur in the study area. The study, thus, highlights the potential of ethnobotanical research and the need for documentation of traditional knowledge pertaining to the utilization of plants as medicine. Pharmachemical analysis is obligatory in order to authenticate their accuracy and future prospects in the drug development with due benefit-sharing with the primary stakeholders for the greater advantage of mankind in the study area. The study could play a significant role in resolving the controversies pertaining to biopiracy and Intellectual Property Rights.

Keywords: Ethnobotany; Medicinal plants; Ethnomedicine; Conservation; Hoshangabad; Madhya Pradesh; India

Introduction

"Ethnobotany", the term coined by John Hershberger in 1895, is the study of "plants used by primitive and aboriginal people" [1]. The human society has developed close association with the plant life [2] since time immemorial. The relationship between the indigenous people and their surroundings forms the subject of ethnobotany, a science [3], which deals with the study of plants used by tribals for food, medicine and clothing [4]. The age-old tribal knowledge of plants is an important aspect of ethnobotanical research. The tribal tracts are the store house of information and knowledge on multiple uses of plants. By the end of 19th century, ethnobotany had started to develop as a science, providing a new tool for pharmaceutical research, that focus not only on the people-plant relationship in a multidisciplinary manner, but also incorporate collection and documentation of indigenous uses, in addition to ecology, economy, pharmacognosy, public health and other disciplines. Presently, ethnobotany has become increasingly valuable in the development of healthcare and conservation programmes in different parts of the world. The vast majority of people on this planet still rely on the traditional medicinal plants and other materials for their everyday healthcare needs. According to the estimates of WHO, about 80% of the population of most developing countries relies on herbal medicines for their primary healthcare needs [5]. India too has a rich tradition of plant-based knowledge on healthcare. The wealth of India is stored in the enormous natural flora which has been gifted to her. Endowed with a diversity of agro-climatic conditions, India is virtually herbarium of the world. The importance of medicinal plants has been

emphasized from time- to- time. It is believed that the drug of natural origin shall play an important role in healthcare particularly in rural areas of India [6]. Medicinal plants typically contain mixtures of different chemical compounds that may act individually, additively, or in synergy to improve health [7]. A large number of plants/ plant extracts/decoctions or paste are equally used for treatment of cuts, wounds, burns, and several other human ailments. Study of literature in hand suggests that no due attention has been paid on ethnobotany of Hoshangabad District, which is inhabited by a large number of tribes such as Gond, Baiga, Kol, Panica, etc. The study is based on discussion made during 2007 and 2009 field excursion by the senior author with the local tribes, knowledgeable persons/ hakims, etc. Although, ethno-medico-botanical work of different areas of Madhya Pradesh have been carried out by many workers [8-36] with the main objective of filling up the knowledge gaps in the important area of biocultural diversity, directly relevant to the welfare of tribal communities living in far flung and inaccessible areas of the same [37]. Since there are no intensive and extensive studies carried out and reported from Hoshangabad region except a few [38-41], an attempt has been made to collate and document the vanishing knowledge of medicinal properties of plants by different tribes of Hoshangabad District, which are used in the treatment of various human and livestock diseases and ailments, ultimately providing the baseline information in the form of immensely valuable database for the commercial exploitation of bioresources.

Methods

Description of study area, climate and vegetation

Hoshangabad District lies in the southwest part of Madhya Pradesh between 77° 50' E Long. & 22° 30' 25" N Lat. (Figure 1). Physiographically, the surface area is almost flat, somewhere uneven with deep gorges and is surrounded by high plateaus, hillocks and has gentle slopes, attaining the elevations varying from 1500'-2000' amsl and is also under cultivation of conventional crops such as rice, wheat, barley and pulses by the Gond, Kurku and other tribals inhabiting therein. The soil in cultivated area is generally blackish sticky clay with fine sand, whereas it is sandy clay in composition in rest of the region. However, at certain places black cotton soil is found in patches.

The study area, in general, experiences a warm and humid climate, which is largely influenced by southwest monsoon. The mean minimum and maximum winter temperatures are 16.3°C and 21°C, respectively, however, the lowest temperature of 1°C is recorded during the month of January. The mean minimum and maximum summer temperatures are 31.6°C and 34°C, respectively. During the extreme hot summer month of June the temperature occasionally rises up to 44°C. The rainfall by and large falls from mid June to September, however, major fraction of it takes place in July and August. The average annual precipitation recorded for the area is 1200mm. Approximately 92% of the total precipitation occurs during the rainy season.

The tropical deciduous forest with dominating teak (Tectona grandis) is prevalent in the study area. In addition, Haldina cordifolia (cf. Adina cordifolia), Lagerstroemia parviflora, Mitragyna parvifolia, Buchanania lanzan, Terminalia tomentosa, Anogeissus latifolia, Schleichera oleosa, Wrightia tinctoria, Bauhinia retusa, B. racemosa, Aegle marmelos, Emblica officinalis, Chloroxylon sweitenia and Syzygium cumini are also frequent. The shrubs in the forest include Ziziphus mauritiana, Melastoma malabathricum, Woodfordia fruticosa and Strobilanthes angustifrons. Around the habitation trees such as Melia azadarachta, Ficus benghalensis and Acacia nilotica together with thickets of Ricinus communis, Adhatoda vasica and Carissa opaca are common. The terrestrial herbs largely comprise grasses, Sida rhombifolia, Oxalis acetocella, Leucas aspera and Ageratum conizoides. However, reed-swamp grasses, Phragmites vulgaris and Typha latifolia grow amply over the swamp area. Hydrocotyle sibthorpioides, Hygrophila auriculata, Polygonum plebeium, Rotala rotundifolia, Ammania baccifera, Cyperus rotundus and Scirpus triangulatus are the other frequent wetland plants in the less waterlogged part of the swamp. Aquatic elements such as



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Lemna paucicostata, Potamogeton nodosus and Nymphoides cristata also grow profusely in ditches and water-accumulated areas over the swamp. The common pteridophytic taxa inhabiting moist and shady places in the forests are Adiantum philippense, Dryopteris prolifera, Ceratopteris thelictroides, Selaginella lepidophylla and Lycopodium clavatum.

Field work and collection of data

Serial Scientific Name

Data presented here is based on personal verbal interviews with traditional healers, hakims/knowledgeable informants in a formal and informal way at their homes and subsequently at their working places during 2007 and also in 2009, wherein the senior author (MFQ) conducted field excursion at different localities/districts of south-western Madhya Pradesh including the Hoshangabad District, India. The study also encompasses some data based on a review of the literature published in scientific journals.

Enumeration

The plants are arranged as trees, shrubs/under shrubs, herbs, climbers and liana(s) and discussed accordingly in tabular form (Table 1), as follows:

Results and Discussion

Table 1: Ethnobotanical uses of plants of Hoshangabad District, south-western Madhya Pradesh, India.

No.	(of Plant)	Local Name	Family	Life Form	Uses
1	Tectona grandis ^{∟inn. f.}	Sagon, Sagwan	Verbenaceae	Tree	Teak holds vast medicinal values. Wood is considered as laxative, a sedative for the uterus, good for piles, dysentery and leucoderma; roots are used for urinary tract problems; flowers are used for bronchitis, nausea and urinary tract problems too; bark in diabetes; a decoction of the fresh or dried leaves is used for menstrual problems and haemorrhage, as well as gargle for sore throats; a plaster made from the powdered wood is used internally to get rid of intestinal parasites, a paste made with water is used on swollen eyelids and also for acute dermatitis and other skin irritation; flowers and seeds are used as diuretic, while oils from fruit seeds is used to stimulate hair growth and soothe irritated skin, etc.
2	Shorea robusta ^{Roxb.} Ex. Gaertn. f	Sal, Sakhua	Dipterocarpaceae	Tree	Gum is utilized to cure dysentery
3	Mangifera indica Linn.	Aam, Amba	Anacardiaceae	Tree	Latex is applied over gums to cure pyorrhoea
4	Madhuca indica Gmel.	Mahua	Sapotaceae	Tree	Root paste is used to cure intestinal worms; leaves warmed with mustard oil are useful in hydrocele
5	Adina cordifolia ^{(Willd. ex} Roxb.) Hook.f. ex Brandes	Haldu	Rubiaceae	Tree	Stem bark is used to treat malarial fever, abdominal disorder, inflammation, wounds and ulcers
6	Mitragyna parviflora	Kaim	Rubiaceae	Tree	Leaf paste is applied on wounds
7	Syzygium cumini (Linn.) Skeels	Jamun	Myrtaceae	Tree	Fresh juice of bark is given with goat's milk as cure of diarrhoea
8	Terminalis bellirica	Bahera	Combretaceae	Tree	Fruit powder mixed with honey is used as laxative
9	Terminalia chebula	Harra	Combretaceae	Tree	Fruit powder mixed with honey is used as purgative
10	Moringa oleifera Lam.	Sahjan	Moringaceae	Tree	fresh leaf juice is taken during high blood pressure
11	Schleichera oleosa (Lour.) Oken.	Kusum	Sapindaceae	Tree	Pulp of fruit is given to dilute the excess consumption of alcohol; seed paste is used to kill worms in animals
12	Semecarpus anacardium ^{Linn.f.} .	Bhela	Anacardiaceae	Tree	Seed oil is used externally in rheumatism
13	Acacia catechu (Linn. f.) Willd	Khair	Mimosaceae	Tree	Bark paste is applied in skin diseases
14	Acacia leucophloea	Rayunch, Rewenja	Mimosaceae	Tree	Bark decoction is given to treat diarrhoea
15	Acacia nilotica (Linn.) Wild. ex Delile (Benth.) Brenan	Babool	Mimosaceae	Tree	Leaves are orally consumed as such and paste is applied locally to cure body swelling
16	Anogeissus latifolia (Roxb. ex DC) WalLinn. ex GuilLinn.& Perr.	Dhaw	Combretaceae	Tree	Powered bark is given orally in diarrhoea
17	Toona ciliata M. Roem.	Mahaneem	Meliaceae	Tree	Bark is used for the treatment of chronic dysentery
18	Aegle marmelos (Linn.) Correa	Bel	Rutaceae	Tree	Leaf ash is used to kill animal wound worms; ripe fruits for cooling and stomach disorders; root bark is used in the treatment of fever
19	Azadirachta indica ^{A. Juss.}	Neem	Meliaceae	Tree	Leaf decoction is used in skin diseases, poultice of leaves and bark is applied to boils; decoction of bark, gum, leaves and seeds are useful in snakebite and scorpion sting; fresh fruit paste in water is applied over forehead to treat headache; seed oil is taken orally as treatment of reddening and inflammation of eves

Habit/

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20	Butea monosperma (Lam.) Taub.	Chihula Palas, Palas	Fabaceae	Tree	Fresh leaves warmed with mustard oil are bandaged in rheumatic pain; dried flowers soaked in water are used for taking bath for preventing sunstroke
21	Cassia fistula Linn.	Amaltas	Caesalpiniaceae	Tree	Leaf paste is used in skin diseases; fruits are used as purgative
22	Dalbergia sissoo Roxb.	Sheesham	Fabaceae	Tree	Powdered bark is given with water to relieve body pain and decoction is given in diarrhoea.
23	Ficus religiosa Linn.	Pipal	Moraceae	Tree	Bark powder ashes are given to children to treat throat infection
24	Ficua racemosa Linn.	Gular	Moraceae	Tree	Dried fruits taken with warm water are helpful in diabetes
25	Terminalia arjuna ^{(Roxb.} ex DC) Wight &Arn.	Kahua	Combretaceae	Tree	Leaves of Kahua, Jamun and Khair pounded together are given to cattle for treatment of diarrhoea; root paste is is used to cure headache; tender leaf paste with sugar and milk is given once a day for 20 days for the treatment of spermatorrhoea
26	Terminalia alata Heyne ex Roth.	Sadad	Combretaceae	Tree	The bark is used in diarrhoea
27	Holoptelea integrifolia (Roxb.) Planch.	Chilbil	Urticaceae	Tree	The paste prepared of leaves is useful in treating ringworm
28	Diospyros melanoxylon ^{Roxb. Ex.} Gaertn. F	Tendu	Ebenaceae	Tree	Leaves are chewed thrice a day for 2-3 days for curing cough
29	Bauhinia variegata	Kachnar	Caesalpiniaceae	Tree	Twigs are used as toothbrush to cure pyorrhoea.
30	Cordia dichotoma G. Frost	Local name- Sal, Sakhua	Ehretiaceae	Tree	Leah decoction with wheat husk and salt is taken to check chest congestion and influenza
31	Flacourtia indica (burm. f.) Merr.	Rakatsowk, Kateyya	Flacourtiaceae	Tree	Leaf sap is dropped into eyes to cure conjunctivitis; fruit juice is given in liver problems
32	Sterculia urens Roxb.	Kullu, Katera Gond	Sterculiaceae	Tree	Bark is used in constipation, liver disease and skin disorders
33	Butea superba ^{Roxb.}	Chiula, Palash bel	Fabaceae	Tree	Seeds are used in the treatment of herpes, skin diseases, ringworm, roundworm, arthritis, flatulence and constipation
34	Bridelia retusa (Linn.) Spreng.	Kasai	Phyllanthaceae	Tree	The bark is useful in backache and hemiplagia and also in treatment of rheumatism and diabetes
35	Dillenia pentagyna Roxb. (Corcat.)	Korkat, Shalyakrni	Dilleniaceae	Tree	The plant is used to treat wounds, pneumonia, burning sensation, fistula and diabetic carbuncle
36	Ceiba pentandra ^(Linn.) Gaertn.	Safed semal, Semra	Bombacaceae	Tree	Root decoction is used in diarrhoea and dysentery; decoction of stem bark is used for treating toothache and mouth problems; also useful in stomach problems, diarrhoea, hernia, gonorrhoea and heart trouble
37	Bombax ceiba Linn.	Semal	Bombacaceae	Tree	It is used for the treatment of sexual debility, root powder is given with milk for 7 days in the morning, treatment is repeated twice every alternate month
38	Casuarina equisetifolia Linn.	Banya suru	Casuarinaceae	Tree	Its bark and woods are used in beri-beri, stomachache, swelling and toothache; seeds are used in bloody diarrhoea
39	Ougeina oogeinensis (Roxb.) Hochr.	Tinsla, Raktal, Shadan	Fabaceae	Tree	Bark is used to treat diarrhoea and dysentery
40	Elaeocarpus sphaericus ^{(Gaertn.) K.} Schum	Rudraksha	Elaeocarpaceae	Tree	It is used to cure headache, hypertension, mental disorder, nervine disease, fever, liver problems, jaundice and blood disease
41	Anthocephalous chinensis (Lam.) A. rich. Ex. Walp.	Kadamb	Rubiaceae	Tree	The paste of stem bark with mustard oil is massaged over rheumatic affected body parts.
42	<i>Michelia champaca</i>	Champa	Magnoliaceae	Tree	Flowers are used to reduce burning sensation, cure skin disease and ulcer; decoction of its bark is used in amenorrhoea.
43	Oroxylum indicum (Linn.) Venten.	Arlu, Saona, Ullu	Bignoniaceae	Tree	Leaf decoction is used in curing diarrhoea and rheumatism
44	Adiantum philippense ^{Linn.}	Kali-Jhanti, Hansawati	Adianthaceae	Tree	The extract of whole plant is used to cure fever, asthma, bronchitis, dysentery, leprosy, and ulcers; powder of rhizome is given as an antidote against dog bite and snake bite
45	Trewia nudiflora ^{Linn.} .	Builor	Euphorbiaceae	Tree	Seed paste mixed with lukewarm milk is taken to cure bone-fever and whooping cough
46	Putranjiva roxburghii ^{Wall}	Jaiputa, Pitunia	Euphorbiaceae	Tree	Dried fruits beaded in a garland is put on the neck to treat skin allergy
47	Pithecellobium dulce	Jangli jalebi	Mimosaceae	Tree	Bark powder is given in fever
48	Annona squamosa	Sharifa, Sitafal	Annonaceae	Shrub	Leaf juice is used as an antiseptic in curing animal wounds
49	Asparagus racemosus ^{Willd.}	Satawar	Liliaceae	Under shrub	Boiled tuberous roots are given to animals and women for seven days to increase lactation

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50	Adhatoda zeylanica	Adusa	Acanthaceae	Shrub	Leaves are used to cure persistent cough and as also utilised as an insecticide
51	Abutilon indicum	Kakai	Malvaceae	Under shrub	Crushed leave powder with wheat roti is given to cattle to treat diarrhoea
52	Barleria prionitis Linn.	Katsaraya, Katai, Piyabasa	Acanthaceae	Under shrub	Leaves are chewed to cure toothache
53	Bauhinia acuminata Linn.	Sivamalli	Caesalpiniaceae	Shrub	Decoction of root bark is used to treat treating inflammation of liver and vermifuge
54	Calotropis procera (Aiton) R. Br.	Madar	Asclepiadaceae	Under shrub	Ash of roots is used to remove pus from the gums; ash of leaves mixed with sugar is used to cure asthma and bronchitis
55	Carica papaya Linn.	Papita	Caricaceae	Shrub	Latex is used to treat toothache
56	Cassia occidentalis	Chakwad	Caesalpiniaceae	Shrub	Leaf juice is used as purgative
57	Coolebrookia oppositifolia ^{Sm.}	Daya	Lamiaceae	Shrub	Leaf paste is applied externally for healing wounds and cuts
58	Clerodendrum serratum (Linn.) Moon.	Bharangi, Duma	Verbenaceae	Shrub	Ointment made from leaves boiled with oil and butter is used in cephalaria and snakebite
59	Datura metel Linn.	Kala Dhatura	Solanaceae	Under shrub	About six inches long root is tied over the pregnant women to check abortion
60	Helicteris isora Linn.	Aithan	Sterculiaceae	Shrub	Fruit paste mixed with water is given in the treatment of stomachache; aqueous extract of seed is given to cure dysentery and stomach pain
61	Hibiscus ros- sinensis ^{Linn.}	Gurhal	Malvaceae	Shrub	Flower extract is used to cure urinary problem; fresh flower is chewed thrice a day to cure bronchitis and whooping cough; stamina column is used in diuretic in kidney troubles
62	Holarrhena pubescens ^(BuchHam.) WalLinn. ex. G. Don.	Chirol	Apocynaceae	Shrub	Dried plant powder with cow milk is given to women to enhance lactation, seed paste mixed with water is in use to cure fever and digestive troubles; bark decoction is used in the treatment of dysentery
63	Ipomoea carnea Jacq.	Behaya, Besharam	Convolvulaceae	Shrub	Leaf paste is applied over boils
64	Jatropha gossypifolia ^{Linn.}	Banren	Euphorbiaceae	Shrub	Twigs are used as toothbrush to cure toothache
65	Nerium indicum MilLinn.	Kaner	Apocynaceae	Shrub	Seeds are burnt to ashes, mixed with mustard oil is applied over wounds
66	Lanatana camara Linn. (Linn.) variety aculeate	Moldeuke/Raimunia	Verbenaceae	Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite
66 67	Lanatana camara Linn. (Linn.) variety aculeate Plumbago zeylanica Linn.	Moldeuke/Raimunia Chita, Chitrak	Verbenaceae Plumbaginaceae	Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts
66 67 68	Lanatana camara Linn. (Linn.) variety aculeate Plumbago zeylanica Linn. Pogostemon benghalensis ^{(Burn.} f.) Kuntze.	Moldeuke/Raimunia Chita, Chitrak Kalibhant	Verbenaceae Plumbaginaceae Lamiaceae	Shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound
66 67 68 69	Lanatana camara Linn. variety aculeate (Linn.) Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. t) Kuntze. Ricinus communis Linn.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae	Shrub Shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism
66 67 68 69 70	Lanatana camara Linn. variety acueate Plumbago zeylanica Linn. Pogostemon benghalensis ^{(Burn.} t) Kuntze. Ricinus communis Linn. Withania somnifera_ (Linn.) DunaLinn.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae	Shrub Shrub Shrub Shrub Under shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women
66 67 68 69 70 71	Lanatana camara Linn. variety acueate Inn. Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. t) Kuntze. Ricinus communis Linn. Withania somnifera. (Linn.) DunaLinn. Sida rhombifolia Linn.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha Sahadevi	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae Malvaceae	Shrub Shrub Shrub Shrub Under shrub Under shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women Powder of whole plant is given orally as treatment of tuberculosis; leaf juice is used in the treatment of spermatorrhoea
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66 67 68 69 70 71 72 73 74	Lanatana camara Linn. variety aculeate Inn. Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. t) Kuntze. Ricinus communis Linn. Withania somnifera_ (Linn.) DunaLinn. Sida rhombifolia Linn. Thevetia peruviana (Pers.) K. Schum. Solanum indicum Linn. Solanum violaceum Ortega.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha Sahadevi Lili kaner Badi kateri Ban bhanta, Anjad	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae Malvaceae Apocynaceae Solanaceae Solanaceae	Shrub Shrub Shrub Shrub Under shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women Powder of whole plant is given orally as treatment of tuberculosis; leaf juice is used in the treatment of spermatorrhoea Latex is used to cure toothache The root is used for treating bronchitis, itching, body aches and toothache; decoction of its root juice is used in ringworms, gout and earache It is useful in curing asthma, dry cough and chronic febrile infections
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66 67 68 69 70 71 72 73 74 75 76	Lanatana camara Linn. variety aculeate Inn. Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. t) Kuntze. Ricinus communis Linn. Withania somnifera. (Linn.) DunaLinn. Sida rhombifolia Linn. Thevetia peruviana (Pers.) K. Schurn. Solanum indicum Linn. Solanum violaceum Ortega. Opuntia dilleni Haw. Ludwigia prostrata Roxb.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha Sahadevi Lili kaner Badi kateri Ban bhanta, Anjad Nagphani, Kanthari Bhulabang	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae Malvaceae Apocynaceae Solanaceae Solanaceae Cactaceae Onagraceae	Shrub Shrub Shrub Shrub Under shrub Shrub Shrub Shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women Powder of whole plant is given orally as treatment of tuberculosis; leaf juice is used in the treatment of spermatorrhoea Latex is used to cure toothache The root is used for treating bronchitis, itching, body aches and toothache; decoction of its root juice is used in ringworms, gout and earache It is useful in curing asthma, dry cough and chronic febrile infections The plant is used to treat asthma, whooping cough, fever, constipation, conjunctivitis, boils, ulcers, oedema, leucorrhoea and menorrhagia Leaves are used in treating toothache
66 67 68 69 70 71 72 73 74 75 76 77	Lanatana camara Linn. (Linn.) Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. 1) Kuntze. Ricinus communis Linn. Withania somnifera_ (Linn.) DunaLinn. Sida rhombifolia Linn. Thevetia peruviana (Pers.) K. Schum. Solanum indicum Linn. Solanum violaceum Ortega. Opuntia dilleni Haw. Ludwigia prostrata Roxb.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha Sahadevi Lili kaner Badi kateri Ban bhanta, Anjad Nagphani, Kanthari Bhulabang Vyagra errand	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae Malvaceae Apocynaceae Solanaceae Solanaceae Cactaceae Onagraceae Euphorbiaceae	Shrub Shrub Shrub Shrub Under shrub Shrub Shrub Shrub Shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women Powder of whole plant is given orally as treatment of tuberculosis; leaf juice is used in the treatment of spermatorrhoea Latex is used to cure toothache The root is used for treating bronchitis, itching, body aches and toothache; decoction of its root juice is used in ringworms, gout and earache It is useful in curing asthma, dry cough and chronic febrile infections The plant is used to treat asthma, whooping cough, fever, constipation, conjunctivitis, boils, ulcers, oedema, leucorrhoea and menorrhagia Leaves are used in treating toothache Young leaves are used to cure urinary infections; tea made from the bark of Jatropha is useful in treating rheumatism, leprosy, fevers and also helpful in jaundice and gonorrhoea
66 67 68 69 70 71 72 73 74 75 76 77 78	Lanatana camara Linn. (Linn.) Plumbago zeylanica Linn. Pogostemon benghalensis (Burn. 1) Kuntze. Ricinus communis Linn. Withania somnifera_ (Linn.) DunaLinn. Sida rhombifolia Linn. Thevetia peruviana (Pers.) K. Schum. Solanum indicum Linn. Solanum violaceum Ortega. Opuntia dilleni Haw. Ludwigia prostrata Roxb. Jatropha curcas Linn.	Moldeuke/Raimunia Chita, Chitrak Kalibhant Rendi, Andi, Arandi Ashwagandha Sahadevi Lili kaner Badi kateri Ban bhanta, Anjad Nagphani, Kanthari Bhulabang Vyagra errand	Verbenaceae Plumbaginaceae Lamiaceae Euphorbiaceae Solanaceae Malvaceae Apocynaceae Solanaceae Solanaceae Cactaceae Onagraceae Euphorbiaceae Rubiaceae	Shrub Shrub Shrub Shrub Under shrub Shrub Shrub Shrub Shrub Shrub Shrub Shrub	Decoction of roots, flowers and stems are used as antidote to snakebite Plant paste is used to heal wound and cuts Whole plant ash mixed with mustard oil is used to kill worms in animal wound Leaves coated with mustard oil and warmed are applied externally on the chest and stomach during pneumonia fever, Lukewarm seedoil is massaged over joints in rheumatism Dry root powder with cow's milk is taken daily for one month to increase fertility in women Powder of whole plant is given orally as treatment of tuberculosis; leaf juice is used in the treatment of spermatorrhoea Latex is used to cure toothache The root is used for treating bronchitis, itching, body aches and toothache; decoction of its root juice is used in ringworms, gout and earache It is useful in curing asthma, dry cough and chronic febrile infections The plant is used to treat asthma, whooping cough, fever, constipation, conjunctivitis, boils, ulcers, oedema, leucorrhoea and menorrhagia Leaves are used in treating toothache Young leaves are used to cure urinary infections; tea made from the bark of Jatropha is useful in treating rheumatism, leprosy, fevers and also helpful in jaundice and gonorrhoea The plant is used to treat skin diseases, colic, flatulence, diarrhoea, indigestion, ulcers and wounds

Fruits are used in the treatment of fever and intestinal worms; leaves are used 80 Datura repens Linn. Neelkanta; Verbenaceae Shrub to treat abscesses Antidesma 81 Amti Euphorbiaceae Shrub Leaves are used as an antidote for snake bite zeylanicum Lam. Carissa opaca Stapf 82 Jangli karaunda Shrub Leaves are useful in cardiac disorders; fruits are used in digestive problems Apocynaceae x Haines The juice of the plant is used in the treatment of fevers; paste made from the Hydrocotyl plant is applied externally on wounds and boils; decoction of the whole plant 83 Khulkhuri Herb Apiaceae sibthorpiodes Lam. is used in the treatment of abscesses, boils, cirrhosis, cold, cough, hepatitis, itching, jaundice, sinusitis and sore throat A paste of its leaves is applied on cuts, wounds and sprains; seeds are used Abelmoschus 84 Kasturi bhindi Malvaceae Herb in aromatherapy for the treatment of depression and anxiety, cramps, poor moschatus Medick circulation and aching point Acanthospermum Paste of the whole plant is used to treat skin diseases and leaf juice is used to 85 Gokharu Asteraceae Herb hispidum DC relieve fever Allium tuberosum The leaves and bulbs are useful in insect bites, cuts, and wounds, while the 86 Ban lahsun Liliaceae Herb seeds are used to treat kidney and liver problems and upset digestive system Alternanthera The whole plant is used for burning sensation, diarrhoea, skin disease, 87 Gudri shak Amaranthaceae Herb sessilis (Linn.) R. Br. ex. DC. dyspepsia, haemorrhoids, liver and spleen diseases and fever Alternanthera 88 Katui shak Amaranthaceae Herb Decoction of its leaves is taken to treat gonorrhoea pungens Kunth Achyranthes aspera Whole plant is given orally as antidote in snakebite: root decoction is used in Amaranthaceae Chirchiri, Latjira Herb 89 stomach pain, fever and cough, helpful during delivery too Amaranthus 90 Chauli Amaranthaceae Herb Leaves are used to treat scorpion bite and snake bite spinosus Linn Aerva lantana (Linn.) Juss. 91 Chaya Amaranthaceae Herb Decoction of leaf is dropped into ears for relief from earache Allium cepa Linn. 92 Pyaz Liliaceae Herb The juice of raw bulb is taken to check sunstroke vomiting Ageratum 93 Neelam khajju Asteraceae Herb Fomented leaves and stems are used in leprosy conyzoides Linn. Andrographis paniculata (burm. f.) WalLinn. 94 Kalmegha, Kirayat Acanthaceae Herb Whole plant decoction is used in animal dysentery Argemone mexicana Latex is used in treating dropsy, jaundice and eye troubles; root paste is applied Bharbhanda, Kateli 95 Papaveraceae Herb in scorpion sting Aristolochia indica 96 Kalesar Herb Aristolochiaceae Leaf decoction with black pepper is given to cure fever Bacopa monneiri 97 Jalneem Scrophulariaceae Herb Decoction of whole plant is used as cure of asthma and snakebite (Linn.) Wetts Centella asiatica (Linn.) 98 Brahmi buti Asclepiadaceae Herb Decoction of whole plant is used as tonic Caesulia axillaris Roxb. 99 Phulave Asteraceae Herb Roots are used to cure mouth sore Leaf juice is used in the treatment of earache, fever and killing the worms in Blumea lacera (Burm 100 Kukronda, Karanda Asteraceae Herb children Centipeda minima 101 Chikani Asteraceae Herb Plant paste is used in tooth ache 102 Cleome gynandra Linn. Fulhul Cleomaceae Herb Leaf paste mixed with salt is applied on forehead to cure headache 103 Cassia absus (Linn.) Chaksu Caesalpiniaceae Herb Seeds are used in ophthalmia and skin troubles Ammomum Decoction of whole plant is used as a gargle in dentle or gum problems; its seed 104 Kali elaichi Zingiberaceae Herb aromaticum Roxb. oil is used in vomiting, indigestion, abdomen pain and rectal disease Coccinia grandis Kundru, Ram 105 Cucurbitaceae Herb Leaf juice is used in the treatment of diabetes (Linn.) Voigt Kachriva Whole plant decoction is used as laxative; seed paste is used for healing 106 Cassia tora Linn. Pumar Caesalpiniaceae Herb wounds and cuts; plant paste is applied in skin disease Cocculus hirsutus Leaf juice is taken as a cooling medicine for gonorrhoea and also used in 107 Charenti Menispermaceae Herb eczema Corchorua aestuans 108 Chaench Tiliaceae Herb Decoction of whole plant is given orally thrice a day in diarrhoea Corchorus olitorius Seed paste is applied over head for a month to check hairfall and also to kill 109 Tiliaceae Herb Chaench louses The juice of whole plant is taken to relieve headache; the crushed leaves are 110 Begonia picta Linn. Patharchatta Begoniaceae Herb used as a poultice or sor nipples; the root juice is used as eye wash to treat conjunctivitis; it is also consumed in the treatment of peptic ulcer

Leaves are used in cold and cough

Herb

Begoniaceae

M F Quamar

111

Begonia sps.

M F Quamar

112	Bergenia sps. (cf. Bergenia ciliata ^(Haw.) Sternb. f.)	Pandamdawi	Saxifragaceae	Herb	A juice or powder of whole plant is used to treat urinary troubles, plant paste is used externally on boil and orally for dissolving stones in the kidneys; the root is used as tonic in the treatment of fever, pulmonary trouble, and in diarrhoea
113	Boerhavia procumbens Banks ex Roxb.	Bishkhapra/ Patharchatta	Nyctaginaceae	Herb	Infusion of herbs is useful in dropsy, menstrual flow regulation and gonorrhoea
114	Centella asiatica (Linn.) Urban	Mandukparni	Apiaceae	Herb	Whole plant is used as brain tonic and in nervine disorders; poultice of leaves is used to treat open sores
115	Chlorophytum arundinaceum ^{Baker}	Safed musli	Liliaceae	Herb	Roots are used in diabetes, spermaturia, leucorrhoea and general weakness
116	Clerodendrum indicum (Linn.) Kuntze	Bharangi	Verbenaceae	Herb	The roots and bark of its plant is used to treat cough, cold, bronchitis, hiccough and asthma
117	Coleus forskohlii Brig.	Garmar	Lamiaceae	Herb	The plant is used in fever, burning sensation, inflammation, muscular spasm, hypertension, diabetes, cardiac debility, allergy and bronchial asthma
118	Clerodendrum seratum ^{(Linn.) Moon.}	Bharangi/ Babhneti	Verbenaceae	Herb	It is used for the treatment of inflammation, anorexia, dyspepsia, flatulence, cough, asthma, bronchitis, hiccough, leucoderma, leprosy and fever
119	Colocasia esculenta (Linn.) Schott.	Bal, Dawl	Araceae	Herb	Tuber is used to treat constipation, stomatitis, hemorrhoides, cancer and general weakness
120	Clerodendrum philippinum ^{Schauer}	Bhant	Verbenaceae	Herb	The plant is used externally as a poultice for rheumatism, decoction of leaves is used for scabies
121	Curcuma aromatica	Jangli haldi	Zingiberaceae	Herb	It is used to treat gastrointestinal and upper respiratory disorders along with headache, and skin inflammation and infection
122	Curcuma angustifolia Roxb.	Tikhur	Zingiberaceae	Herb	It is used in indigestion, skin diseases, cough, bronchitis, allergy, leucoderma, and as general tonic; exteremely beneficial in diarrhoea, dysentery and colitis
123	Curcuma amada ^{Roxb.}	Amahaldi	Zingiberaceae	Herb	Commonly used to treat pimples, acne and black heads and also used in the treatment of inflammatory conditions and leprosy
124	Cymbopogon schoenanthus ^(Linn.) Spreng.	Rousaghash	Poaceae	Herb	Tea prepared from leaves is used (1-4 cups per day) to relieve congestion, coughing, bladder disorders, headaches, fever, stomach aches, digestive problems, gas, bowel spasms, vomiting and flu symptoms
125	Cyperus platyphyllus Roem & Schutt.	Jalmotha,Jalmustak	Cyperaceae	Herb	It is used in the treatment for fever and abdomen disease
126	Cynoglossum Ianceolatum ^{Forsk.}	Kamraj	Boraginaceae	Herb	Its root is used in the treatment of eye troubles and also used in fever
127	Elephantopus scaber	Gojihva, Ranchi	Asteraceae	Herb	Roots and leaves are used in dysuria, diarrhoea, dysentery, madness, abdominal pain and bone fracture
128	Eryngium foetidum	Jangli dhania	Apiaceae	Herb	The plant is used in the treatment of burns, earache, fever, hypertension, constipation, fits, asthma, stomach ache, worms, infertility complications, snakebite, diarrhoea and malaria
129	Emilia sonchifolia (Linn.) DC	Hirarikhuri	Asteraceae	Herb	Juice of fresh whole plant is given in the dose of 5-10 ml daily for three days to cure intestinal worms; the decoction of the whole plant is very effective for fever
130	Evolvulus alsinoides (Linn.) Linn.	Neeli shankhpushpi	Convolvulaceae	Herb	The leaves are used as chronic bronchitis and asthma; the root is used for curing childhood fever and the oil stimulates the growth of hair; decoction of whole plant with cumin and milk is used to treat fever
131	Leucas aspera Spreng.	Guma	Lamiaceae	Herb	Leaf juice applied in scabies, psoriasis and skin ailments
132	E. nummularis (Linn.) Linn.	Musakani/ Bhuichipki	Convolvulaceae	Herb	Whole plant is used to treat paralysis, epilepsy, convulsions and spasms
133	Leonotis nepataeifolia ^{R. Br.}	Ukmad, Bara Guma	Lamiaceae	Herb	Leaves are used in the treatment of fever and cough; it is also used in case of snake bite
134	Hyptis suaveolens (Linn.) Poit.	Bilayati tulsi, Dona	Lamiaceae	Herb	Extracts of its plants is used to treat skin diseases
135	Impatiens balsamina	Gulmehndi	Balsaminaceae	Herb	It is used in the treatment of inflammation, burns, ulcers, constipation, arthritis and urinary retention.
136	Galactia tenuiflora (Linn.) Sw.	Mashpatri	Fabaceae	Herb	Its leaf and seeds are very useful in worm infection
137	Mariscus sumatrensis ^{(Retz.) J.} Raynal	Jungli motha	Cyperacea	Herb	Stem bark is used in gonorrhoea and wound
138	Lygodium flexuosum (Linn.) Sw.	Badi bhulan, Kali bhulan	Lygodiaceae	Herb	Infusion of the plant is used in menorrhagia; fresh plant juice is used in snake bite; the fresh root boiled with mustard oil is applied externally in rheumatism, sprains, scabies, ulcers, eczema, cut and wounds; it is particularly useful as a local application to carbuncles
139	<i>Mimosa pudica</i> ^{Linn.}	Chuimui, Lajbanti	Mimosaceae	Herb	It is very useful in diarrhoea, amoebic dysentery and bleeding piles and also used in bronchitis, gynaecological disorders and general weakness and impotence

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140	Oxalis corniculata Linn.	Tinpatiya	Oxalidaceae	Herb	Whole plant is used in dyspepsia, haemorrhoids, dysentery, diarrhoea, dysmenorrhoea, amenorrhea, hepatitis and burning sensation
141	<i>Mirabilis jalapa</i> ^{Linn.}	Gulabbas	Nyctaginaceae	Herb	Decoction of leaves is used to treat abscesses, leaf juice is used to treat wounds; roots are used in inflammation and dropsy
142	Passiflora edulis Sims.	Rakhiphul	Passifloraceae	Herb	Flower is used in insomnia, anxiety and nervous disorders
143	Polygonum hydropiper ^{Linn.}	Gondali	Polygonaceae	Herb	Decoction of the whole plant is used in the treatment of diarrhoea, dyspepsia, itching, excessive menstrual bleeding and hemorrhoides, poultice of the plant is used in the treatment of swollen and inflamed areas
144	Piper longum Linn.	Pan/Pippali	Piperaceae	Herb	The fruits and roots are used in the treatment of cough, bronchitis and asthma; applied locally for muscular pains and inflammation, in dysentery and leprosy
145	Psoralea corylifolia	Babchi, Bakuchi	Fabaceae	Herb	It is used in the treatment of febrile diseases, premature ejaculation, impotence, lower back pains, frequent urination, incontinence bed wetting
146	Scoparia dulcis Linn.	Mithibuti	Scrophulariaceae	Herb	Leaves are used in the treatment of fever, cough, bronchitis and dental trouble, leaves and stems are also used for treating diabetes
147	Ruta graveolens Linn.	Sitab	Rutaceae	Herb	This plant is used for worm infections, spasmodic pain, epilepsy and amenorrhoea
148	Remusatia vivipara (Roxb.) Schott.	Laxman kand	Araceae	Herb	Tuber is used in the treatment of cancer and arthritic pain
149	Sida cordata ^(Burm. f.) Borssum	Rajbala.Vishkhapri	Malvaceae	Herb	Leaves are used in the treatment of piles, rheumatism and gonorrhoea; infusion of its root is very useful in cystitis, strangury, haematuria, chronic dysentery, leucorrhoea and gonorrhoea
150	Zea mays Linn.	Makai, Makka	Poaceae	Herb	Decoction of the leaves and roots is used in the treatment of strangury and dysuria; corn is used in diabetes, colic, jaundice, vomiting, arthritis and general weakness.
151	Thalictrum folilosum	Mameera	Ranunculaceae	Herb	Roots are used for dyspepsia, fever, indigestion, ulcers and haemorrhoids
152	Swertia angustifolia BuchHam ex D. Don	Pahari chirayata	Gentianaceae	Herb	Its leaves are used to treat fever, abdominal disorders, nausea, indigestion, constipation, dyspepsia, skin diseases, cancer and liver
153	Zingiber capitatum	Vach Kanda	Zingiberaceae	Herb	It is used in stomach ache, nausea, diarrhoea, cholera, bleeding piles, asthma, heart problems and respiratory disorders
154	Zingiber zerumbet (Linn.) Roscoe ex Sm.	Narkachur	Zingiberaceae	Herb	Roasted rhizome is used to treat indigestion, toothache, stomachache and cough; rhizome juice is used in diarrhoea and dysentery
155	Zingiber cassumunar Roxb.	Jangli Adrak	Zingiberaceae	Herb	Rhizome is used to treat indigestion and inflammation
156	Gynandropsis gynandra ^{(Linn.) Briq.}	Hurhur	Capparidaceae	Herb	Seeds are used as anthelmintic.
157	Vitis vinifera Linn.	Angoor	Vitaceae	Climber	Angoor is used in burning sensation, constipation haemorrhoids, anaemia, skin disease, colic, jaundice, vomiting, arthritis and general weakness
158	Tylophora rotundifolia ^{BuchHam} ex Wight	Dambuti	Asclepiadaceae	Climber	Root extract is used in chest pain, indigestion and insect bite
159	Smilax zeylanica Linn.	Chop chini	Liliaceae	Climber	The plant is used to treat insanity, colic, diarrhoea, syphilis, gonorrhoea, leucorrhoea, arthritis, fever, impotency, skin disease and general weakness
160	Cayratia auriculata (WalLinn.) Gamble	Jangli angoor	Vitaceae	Climber	The plant is used in cough, cold, hydrocele, wound, abscess, intestinal worm and rheumatism
161	Rubia cordifolia Linn.	Manjistha	Rubiaceae	Climber	The roots are used to treat rheumatism, ulcers, inflammation, skin disease, leucoderma, diarrhoea, dysentery, chronic fever and urinary problems
162	Dioscorea bulbifera	Khanima kand, Gethikand	Dioscoriaceae	Climber	Tubers are used to treat wounds, fistula, diabetic carbuncle, pneumonia and burning sensation
163	Dioscoria hispida Dennst.	Bhaichadi, Kirchikand	Dioscoriaceae	Climber	Tubers are used in ulcer, to kill worms in wounds and also used in whitlow, sores, boils of rabbit, jackal or dog
164	Clematis smilacifolia WalLinn.	Gajprasarni	Ranunculaceae	Climber	Leaves are used in cold
165	Cayratia trifolia ^(Linn.) Domin.	Tripatti	Vitaceae	Climber	The root, grounded with black pepper, is applied on boils
166	Celastrus paniculatus ^{Willd.}	Malkangani	Celasteraceae	Climber	Seeds are used in abdominal disorder, leprosy, skin diseases, paralysis, asthma, leucoderma, cardiac debility, inflammation, amenorrhoea, dysmenorrhoea and fever, and for stimulating the intellect and sharpening the memory
167	Butea superba ^{Roxb.}	Chiula, Palash bel	Fabaceae	climber	The seeds are used in the treatment of herpes, skin disease, ringworm, round worm, arthritis, flatulence and constipation
168	Asparagus racemosus ^{Willd.}	Satawar	Liliaceae	Climber	Roots are used in the treatment of nervous disorders, diarrhoea, dysentery, tumor, inflammation, tuberculosis, leprosy and fatigue
169	Basella rubra ^{Linn.}	Poi	Basellaceae	Climber	Leaf juice is useful in biliousness, dysentery and leprosy; paste of root is applied in swelling

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170	Antidesma zeylanicum ^{Lam.}	Amti	Euphorbiaceae	Climber	Leaves are used as an antidote in snake bite
171	Antigonon leptopus Hook & Arnott.		Polygonaceae	Climbing shrub	Paste of fresh leaves applied externally in skin disorders
172	Abrus precatorius Linn.	Ghumchi	Fabaceae	Climber	Seeds are used in cellulites, gangrene, gastritis, nephritis, ulcers, typhoid and cholera
173	Celastrus paniculatus ^{Willd.}	Unjan	Celastraceae	Climber	Powdered bark is taken with cow milk once a day for a month to cure leucorrhoea
174	Smilax zeylanica Linn.	Ramdatoon	Smilaceae	Climber	Stems are used as toothbrush in tooth ache
175	Ampelocissus latifolia ^{(Roxb.) Planch}	Jangli angoor	Vitaceae	Climber	Leaf juice is used in dental troubles; decoction of roots is used in dysentery
176	Cissampelos pareira	Akandi	Menispermaceae	Climber	Fresh root extract is given daily for 3 days to cure fever.
177	Ziziphus oenoplia (Linn.) MilLinn.	Jharberi	Rhamnaceae	Climber	Ripe fruits are eaten to check dysentery and get relief from burning sensation during urination
178	Ventilago denticulate	Keonti	Rhamnaceae	Liana	Stem pulp mixed with curd is given to cure eye inflammation

From the ongoing account, it is evident that

- 1. There is very well developed ethnomedicinal system present in Hoshangabad District, India. Local people have great expertise with the plants of their own surroundings. Besides, the overexploitation of species for fuel, fodder, medicine, wild edibles and house building may lead to decline of these species from the area. Conservation and cultivation of these plant species will help to maintain the ecological balance, traditional knowledge as well as livelihood safety of the local inhabitants.
- 2. In view of seeing the exploitation of the biodiversity, traditional knowledge in developing countries like India is eroding at a faster rate. Therefore, it is felt as an urgent need to inventories and record all ethnomedicinal information available into diverse ethnic communities before the traditional culture is completely lost.
- 3. The ethnobotanical information, besides listing the traditional uses of plants, helps ecologists, taxonomists, watershed and wildlife managers in their efforts for improving the wealth of the area.
- 4. Since the area has good ethnobotanical potential for medicinal plants, it could be a suitable place for further ethnobotanical and ethnopharmacological studies. We are aware that this study was not extensive, but only a first contribution to the ethnobotany of this region, focusing on medicinal plants. It is also the first field research into medicinal plants conducted in Hoshangabad District with ethnobotanical methodology. However, more studies are necessary to establish an archive of data in Hoshangabad regions.
- 5. The plant parts used widely to treat human and live stock problems included root, stem, leaves, seed, fruit, etc. Herbal medicines prescribed by the tribal healers are either preparation based on single plant part or a combination of several plant parts to cure respective diseases rapidly. Generally fresh part of the plant is used for preparation of medicine. When fresh plant parts are unavailable, dried parts are also used. The people are largely dependent on

the traditional healthcare system. Traditional beliefs in the area also have their unintentional role in the conservation and sustainable utilization of medicinal plants. Hence, efforts must be taken to protect these species in this area by involving the local communities in preservation and conservation aspects [43]. The information gathered from the tribes of Hoshangabad District is useful for further research in the field of ethnobotany, taxonomy and pharmacology. The information could also be useful for the industry, pharmacologists, physicians, phytochemists, botanists, and alike interested in the development of alternative therapies [44,45]. For lesser known plant species, such a secret treasure trove of information could prove beneficial in phyto-pharmacological research for the discovery of new therapeutic drugs [46,47].

- 6. In view of seeing the growing concern among the developing countries about the emerging threats of the biopiracy and the intensity of IPR controversies, the present documentation of biodiversity could be of great help in resolving the aforesaid issues and settling the disputes [37,48].
- 7. Indigenous knowledge of rural or cultural groups has great significance in formulating applicable strategy for the development of any region. This scattered, secretive, fast eroding, highly valuable knowledge needs proper documentation. The precious indigenous knowledge, when supplemented and validated by the latest scientific insights, can offer new holistic models of sustainable development that are economically viable, environmentally benign and socially acceptable [48].
- 8. Further clinical trials are required to test their efficacy and the study could be of help to develop new drugs based on herbal medicine for effective remedy of different ailments. Popular knowledge of plants used by humans is based on thousands of years experience. By "trial and error", people learnt how to recognise and use plants, including those with a magic-religious function. The folk 'phytotherapy' is 'aging' in the sense that knowledge of medicinal plants persists in elderly rural people with little schooling knowledge. The

transmission of this type of knowledge from generation to generation is now threatened in this region and tends towards disappearance.

9. The information generated from the present study regarding the medicinal plants used by the tribals need a thorough phytochemical investigation including alkaloid extraction and isolation along with a few clinical trials in future course of time. This could help in creating mass awareness regarding the need for conservation of such plants and also in the promotion of ethno-medico-botanical knowledge within the region, besides contributing to the preservation and enrichment of gene bank of such economically important species before they are lost forever. Unsustainable use of land resources has serious negative effect on the flora of this region. Sometime, overexploitation of a particular species can also lead to the incidental disappearance of other nontargeted species. People of that region rely on ethnomedicine and in most problems, they go to hakims, ojhas, gunias and bhumkas because of the poor healthcare condition. There are a lot to be done in this promising field with the active support of village people so that importance of these economically important plants could be rejuvenated for the benefits of our future generation and also need to improve healthcare condition.

Conclusion

From the perusal of the aforementioned discussion, it can, thus, be said that the present study reveals the traditional system of primary healthcare that utilises the plant resources as medicines in the research area (Hoshangabad District), India. These plant resources, though, still play a pivotal role in meeting basic health care of local tribal communities, there is immediate need to ensure the conservation and sustainable use of medicinal plant species in the study area. Efforts should also be taken to start sustainable cultivation and harvesting programs in Hoshangabad District and adjoining areas. It is expected that the database generated could contribute in filling the gaps for the compilation of a local biodiversity register, a key gadget for achieving the goals of regional and global biodiversity conservation need to be thoroughly subjected to pharmachemical analysis in order to verify their authenticity and future prospects.

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