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Ethno-Botanical Study of Medicinal Plants Used by Tribes in the Dindori District of Madhya Pradesh, India

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SINCE early civilization, tribes of Central India have been using plant extracts as traditional medicine. The objective of our study was to catalogue the ethno-medicinal plants whose diverse morphological parts are used by the tribal communities belonging to Shahpura, Dindori and Mehadwani blocks of Dindori district, Madhya Pradesh, India. Questionnaires were provided and Semi -structured interviews were conducted with the local tribal community. In our study, 41 plant species belonging to 36 genera and 25 families have been reported for various medicinal and therapeutic uses. These plant species were used to treat conditions such as respiratory, digestive and skin ailments. Leaves were found to be the most used part of the plant, and decoctions were the most common preparations used for treatment. Upon processing the data, various indices were as follows: Use Value was ranging from 0.01 to 0.13; ; Relative Importance Index ranged from 93.75 to 16.25 and Informant Consensus Factor range was 0.33 to 0.96. These indices are important to understand the efficacy of diverse medicinal plants used by tribes in the Dindori district, and may contribute to the development of new plant-based drugs.

Keywords: Ethno-botany, India, Medicinal plants, Traditional knowledge, Use value.

Introduction

The preliminary aspect of Ethnobotanical research is to study the tribal indigenous knowledge of plants. All native cultures of the world have used medicinal plants as source of medicine. WHO accords that herbal medicines serve the health needs of about 80% of the world's population, especially those residing in the rural areas of developing countries. Ethnobotanical studies enables the development of contemporary drugs and treatments through proper documentation of the medicinal use of plants as well as for plant conservation (Calzada & Bautista, 2020).With a compelling tradition of more than 5000 years of plant-based medicines, India is a rich repository of traditional knowledge on medicinal plants. The ancient medicine systems of India like Ayurveda, Siddha, Sowa Rigpa (Amchi) and Unani are codified and with most cogent evidences showing their efficacy. Reports indicate that Ayurveda, Siddha and Unani systems use more than twelve thousand, nine hundred and seven hundred species of plants; respectively for the traditional medicinal preparations. The folk medicine in India have also been playing a key role, mainly in remote and rural areas and it is estimated that about 8000 plants species are used in folk medicines. Nearly 25,000 effective plant-based formulations are used by local folk medicine practitioners in India (Sen & Chakraborty, 2016). These folk medicines are non-codified. Tribal population and forest dwellers form a considerable part of the population of the region of Central India. Madhya Pradesh is home to a large population of tribal communities belonging to various ethnic groups. The Baigas are one of the oldest aboriginal tribes which are classified as one of the primitive tribes of Madhya Pradesh based on pre-agricultural technology, low literacy and stagnant/diminishing population (Tewari, 1984). Central India is endowed with sub-tropical forests and these areas have various plants as natural resources. Baiga and Sahariya are the major tribal communities of the Dindori district. Baiga tribes comprise a larger population and they still practice herbal medicines. The herbs are used for treatment of various health disorders at a very low cost. Many valuable research papers

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on ethno-medicinal plants of the Dindori district have been published by various researchers (Mudaiya et al., 2016; Marko & Sandhya, 2020), though there are still many unchartered territories which need to be surveyed extensively for search of ancient traditional medicines.

The principal objective of this investigation was to present indigenous knowledge and uses of wild plants by tribes of Dindori district of Madhya Pradesh, India for treatment of various ailments and diseases. Ethnobotanical indices like UV (Use Value), RI (Relative Importance), Informant Consensus Factor (ICF), therapeutic use, mode of preparation of medicines and conservation status were documented and analyzed.

Materials and Methods

Study site

Dindori India, the central region has considerable population of different tribes. By studying these communities many of the uncommon uses of plants have come to our knowledge. Interesting data on ethno-medicinal plants have also been derived. In most parts of Central India plants are used as herbal medicine traditionally for various diseases. Dindori, a town of Madhya Pradesh, is the district headquarters. The Dindori district comprises a total of 927 villages. The district is a part of the Jabalpur Division of Madhya Pradesh. Dindori is located in the eastern part of Madhya Pradesh, with an area of 7,470 km^2; situated adjacent to Mandla district in the West, Shahdol district in the East, Umaria district in the North and Bilaspur district of the state of Chhattisgarh in the South. The district is situated between the latitudes 23.37º N and 22.44º N and longitudes 80.48º E and 81.76º E. It is divided into 7 blocks namely Amarpur, Bajag, Dindori, Karanjiya, Mehadwani, Samnapur and Shahpura. Baigas are the most prominent among the other major tribes like Gond and Sahariya.

Data collection

An extensive ethnobotanical survey was conducted in villages of **Shahpura, Dindori and Mehadwani** block in Dindori district (Figure1), between February-May 2021. Field trips were conducted to collect plant species and data. The data was collected through interviews and questionnaires from healers using the purposive sampling method. Local knowledgeable persons i.e. medicine men, 'ojhas', 'vaidyas' etc. mostly of Baiga and Gond tribes were consulted for their traditional knowledge. All the informants were male and in the age of 40-70 (35 above the age of 50 and 5 below 50 years of age). Ethnobotanical information was collected by the standard method of Jain & Rao (1977). A questionnaire was prepared to collect data for this purpose; information on the use of plants, other than medicinal purpose was also taken. Various indices were calculated on prevalent diseases from the tribes. The plant part used for the formulation of dosage were also recorded. The supportive plant specimens were photographed and collected with the help of respondents during the survey. The specimens were identified with the help of the document "Flora of Madhya Pradesh" (Mudgal et al., 1997; Singh et al., 2001).

Data analysis

Use value (UV)

The use value is an index which indicates the relative importance of locally known plant taxa, depending on the number of uses recorded for each species. It was calculated by following the formula given by Abe & Ohtani (2013)

$UV=Ui/n$

Ui: Number of use mentioned for each species.
n: Number of informants

Relative importance (RI)

Relative importance is an index which depicts the importance of a species on the basis of number of body organ systems treated and number of pharmacological uses of each taxa (Bennett & Prance, 2000).

$RI= (Rel\ PH+Rel\ BS)/2 \times 100$

where PH: Reported pharmacological properties, Rel PH: Relative number of pharmacological properties, BS: Number of body systems treated and Rel BS: Relative number of body systems treated.

Informant consensus factor (ICF)

It denotes the consensus of informants related to the use of plant species in treating different disease category (Yabrir et al., 2018).

ICF= (Nur-Nt)/ Nur-1

Nur: Number of uses reported for a particular disease category, Nt: Number of plant species use to treat tat disease category.

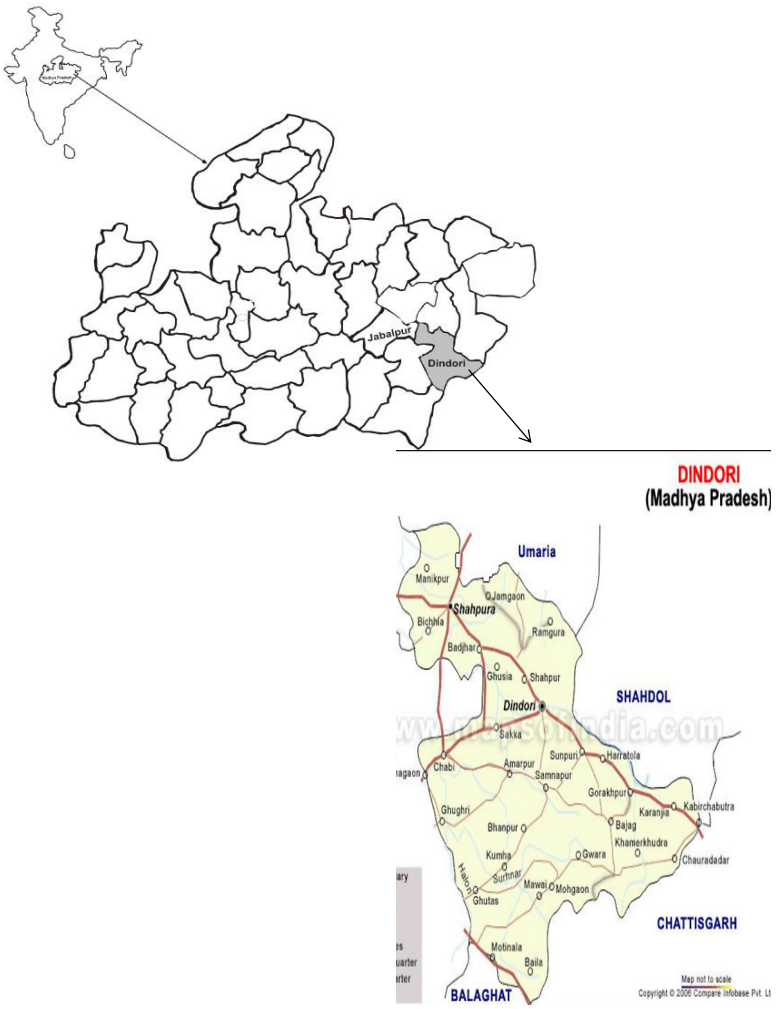

Fig. 1. Location of study area

Life forms: The classification of plant species on the basis of life forms was done as outlined by Mishra (1968).

Results and Discussion

Ethno-medicinal richness

In the present study all plant species in the enumeration were cited by their family, local name, components used, and various uses for the treatment of illness and diseases (Table 1). A total of 41 plant species belonging to 36 genera of 25 families have been reported for various therapeutic uses. Ethno-medicinal uses of ethnic plants used by the tribes in the district have been reported, likewise Ahirwar & Shakya (2015) have also described uses of medicinal plants in Mandla district by Baiga tribes of Madhya Pradesh.

Among the reported species, 18 species were collected from wild whereas 2 species were cultivated by the local tribes and 21 species were collected from wild as well as cultivated.

In our current study Fabaceae was the dominant family with three species, Combretaceae was second most dominant followed by Caesalpiniaceae, Lamiaceae, Moraceae and Apocynaceae with two species each and rest of the families with one species each **(**Fig. 2). The current study supports the idea that local people use dominant plant families and species for disease treatment (Hussain, 2019). One of the reason might be, more access to above mentioned families in the study area. Also high frequency of cultivation of species of Fabaceae in that locality may be another reason for dominance of this family (Qaseem et al., 2019). Jadid et al. (2020) reported that in 30 medicinal plant species recorded, Poaceae and Zingiberaceae were dominant ones and were mostly used in medicinal practices.

TABLE 1. List of documented ethnobotanic plants used by the communities living in Dindori District, Madhya Pradesh

No.	Scientific name	Family	Vernacular name	Use value	Plant form	Conservation status	Growing status	RI
1	*Acacia catechu* (L.f.) Willd.	Fabaceae	Babool	0.01	T	NE	C/W	45
2	*Acacia leucophloea* (Roxb.) Willd.	Fabaceae	Khair	0.01	T	LC	W	61.25
3	*Acacia nilotica* (L.) Delile	Fabaceae	Reunja	0.01	T	LC	W	32.5
4	*Acacia pennata* (L.) Willd.	Fabaceae	Biswal	0.01	T	LC	W	87.5
5	*Aegle marmelos* (L.) Corrêa	Rutaceae	Bilpatra	0.06	T	NE	C/W	16.25
6	*Albizzia lebbek* Linn.	Fabaceae	Kala Siris	0.02	T	LC	W	32.5
7	*Annona squamosa* L.	Annonaceae	Sitaphal	0.02	S	LC	C/W	81.25
8	*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Bedd.	Combretaceae	Sharifa	0.01	T	NE	W	48.75
9	*Argemone mexicana* L.	Papaveraceae	Satyanashi	0.01	H	NE	W	90
10	*Andrographis paniculata* (Burm.f.) Nees	Acanthaceae	Kalmegh	0.03	H	VU	C	28.75
11	*Asparagus racemosus* Willd.	Liliaceae	Satavar	0.01	S	EN	W	32.5
12	*Azadirachta indica* A. Juss.	Meliaceae	Neem	0.05	T	LC	C/W	71.25
13	*Boerhavia diffusa* L.	Nyctaginaceae	Patharchata	0.02	S	LC	W	45
14	*Bauhinia variegata* L.	Fabaceae	Kachnar	0.02	T	LC	C/W	83.75
15	*Bacopa monnieri* (L.) Wettst.	Scrophulariaceae	Brahmi	0.01	H	LC	C/W	22.5
16	*Buchanania lanzan* Spreng.	Fabaceae	Achar, Chironji	0.02	T	LC	C/W	16.25
17	*Butea monosperma* (Lam.) Taub.	Fabaceae	Dhak, Palas	0.01	T	DD	C/W	45
18	*Calotropis gigantea* (L.) Dryand.	Apocynaceae	Akwan	0.02	S	DD	W	32.5
19	*Carissa spinarum* L.	Apocynaceae	Karaunda	0.01	S	LC	W	16.25
20	*Cassia fistula* L.	Caesalpinaceae	Amaltas	0.02	T	LC	W	48.75
21	*Centella asiatica* (L.) Urb.	Apiaceae	Brahami	0.13	H	LC	C/W	16.25
22	*Canavalia ensiformis* (L.) DC.	Fabaceae	Bade semi	0.01	C	LC	W	28.75
23	*Cynodon dactylon* (L.) Pers.	Poaceae	Dub	0.06	H	LC	W	16.25
24	*Dalbergia sissoo* DC.	Fabaceae	Sheesham	0.01	T	LC	C/W	22.5
25	*Dioscorea bulbifera* L.	Dioscoriaceae	Ratalu	0.01	C	VU	C	16.25
26	*Euphorbia hirta* L.	Euphorbiaceae	BadaDudhi	0.01	T	LC	W	38.75
27	*Ficus benghalensis* L.	Moraceae	Bargad	0.01	T	LC	W	16.25
28	*Ficus religios* L.	Moraceae	Pipal	0.01	T	LC	W	16.25
29	*Gmelina arborea* Roxb.	Lamiaceae	Khamer	0.01	T	LC	C/W	67.5
30	*Madhuca longifolia* (J.König ex L.) J.F.Macbr.	Sapotaceae	Mahua	0.03	T	EN	C/W	65
31	*Mangifera indica* L.	Anacardiaceae	Aam	0.05	T	DD	C/W	48.75
32	*Ocimum sanctum* L.	Lamiaceae	Tulsi	0.08	H	NE	C/W	90
33	*Piper longum* L.	Piperaceae	Pipli	0.02	H	VU	W	16.25
34	*Phyllanthus emblica* L.	Phyllanthaceae	Amla	0.03	H	VU	C/W	16.25
35	*Plumbago zeylanica* L.	Plumbaginaceae	Chitwar	0.01	S	NE	C/W	32.5
36	*Semecarpus anacardium* L.f.	Anacardiaceae	Bhilwa	0.01	T	NE	W	93.75
37	*Syzygium cumini* L.	Myrtaceae	Jamun	0.02	T	LC	C/W	22.5
38	*Tamarindus indica* L.	Caesalpiniaceae	Imli	0.01	T	LC	C/W	16.25
39	*Terminalia arjuna* (Roxb. ex DC.) Wight &Arn.	Combretacea	Harra	0.09	T	NE	C/W	32.5
40	*Terminalia chebula* Retz	Combretaceae	Harra	0.09	T	VU	C/W	93.75
41	*Trigonella foenum-graecum* L.	Fabaceae	Methi	0.03	H	NE	C/W	16.25

Abbreviations used: T: Tree, H: Herb, S: Shrub, VU: Vulnerable, LC: Least Concern, NE: Not Evaluated, EN: Endangered, C: Cultivated and W: Wild.

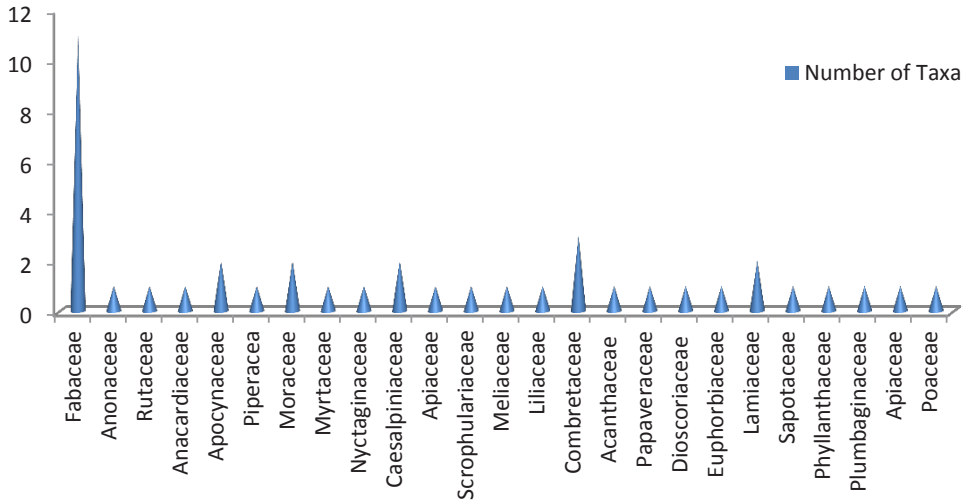

Fig. 2. Number of taxa of documented plant families

Amongst mentioned species, tree form dominated the list with 58% of which 40% were wild and 60% were both wild and cultivated. Herbs were the second most dominant form with 18.6% (12.5% cultivated, 37.5 % wild, and 50% cultivated and wild) followed by shrubs 14% (66.6% wild and 33.3% cultivated and wild). Two climbers *Canavalia ensiformis* (wild) and *Dioscorea bulbifera* (cultivated) were reported.

Use value

Use value represents the importance of a particular species by a community in an area. High use value indicates higher exploitation of the species. The use values of species cultivated were higher than the species obtained from wild. The reason may be less accessibility. As farther the species grows, less frequently it is used. Many researchers have reported that usage and knowledge of ethno-medicinal plants increases in relation to their proximity (Johnson et al., 2010; Sõukand & Kalle, 2010). However low use value may also indicate gradual loss of traditional knowledge about a particular taxa. The range of use value in the current study was 0.01-0.13. *Centella asiatica* had the highest value 0.13 followed by 0.09 of *Terminalia* sp., 0.08 of *Oscimum sanctum*, 0.06 of *Cynodon dactylon*, 0.05 of *Mangifera indica* and *Azadirachta indica*. Use value of *Trigonella foenum-graecum*, *Phyllanthus emblica, Madhuca longifolia* and *Andrographis peniculata* was 0.03.

Relative importance index (RI)

The RI values ranged from 93.75 to 16.25. (Table 1). *Terminalia chebula* and *Semecarpus anacardium* had the highest RI value. As reported, these species were used to treat 8 different diseases belonging to 5 body systems. These were followed by *Oscimum sanctum* and *Argemone mexicana* with RI value 90 for each species. We found 9 versatile species with more than 5 pharmacological properties viz *Acacia leucophloea, Acacia pennata, Annona squamosa, Argemone mexicana, Azadirachta indica, Bauhinia variegata, Gmelina arborea, Ocimum sanctum, Semecarpus anacardium* and *Terminalia chebula.*

Informant consensus factor (ICF)

The ICF value in the current study ranged from 0.33 to 0.96 (Table 2). The highest ICF value was found for endocrine system ailments (0.96), followed by respiratory, digestive and urinary systems. Higher ICF value (>0.5) indicates consensus among informants about the therapeutic use of the plant species. On the other hand, lower ICF depicts less knowledge sharing among people. As same medicinal plants were used for treatment of diabetes and lactation we found the highest ICF values for endocrine system. High ICF of digestive system may be due to higher prevalence of diarrhea, dysentery, gastritis and stomach ache and also availability of choices of different plant species. Our result is in accordance with Panmei et al. (2019) and Palabas Uzun & Koca (2020) who reported high ICF for digestive disorder and endocrine category; respectively.

Conservation status and challenges

Because of unsustainable use, approximately 40-50% of medicinal flora is under different categories of threat globally (Allen et al., 2014) and in India more than 90% of medicinal plants are

facing threat (Kumari et al., 2011). In the current study, 36 plant species used in Dindori district, are under threat on a global scale (22 taxon LC, 5 taxon VU and 1 taxon EN). 2 taxa had Data Deficient (DD) status as enough data was not available. Shivanna (2020) stated, 'The 6th mass extinction has been brought to the forefront, as species extinction rate has increased to 100 or even 1000 fold compared to previous extinctions due to ever increasing human population and anthropogenic activities'. Goraya & Ved (2017) reported that in a span of 10 years (2005 - 2014) tremendous increase in demand and supply of the medicinal plants were recorded. To conserve the ethno-medicinally important plants, in 2019 National Medicinal Plant Board, India, prioritized 32 medicinal plants for conservation. Some of which are also reported in the current study viz *Cassia angustifolia , Phyllanthus emblica, Ocimum sanctum , Plantago ovata , Chirata* sp. (NMPB 2020b).

Ethno-medicinal uses

Many human diseases were treated with the use of reported species. We found that plants are mostly used to cure ailments like tooth problem, skin diseases, menstrual disorder, piles, asthma, enlargement of cervical gland, ulcer, wounds, leukoderma, sore throat, respiratory disorder, hematuria, miscarriage, jaundice, fever, insanity, leucorrhoea, bleeding during pregnancy, spermatorrhea, infertility in women, abortifacient, cataract, scorpion-snake bite, wounds of animals, destroying worms in children, gastropathy, bilious vomiting, stomach disorder, intestinal worms, diabetes, rheumatism, scabies, wart and easy delivery with convalescence. Maximum plants species were involved in stomach related problems followed by pain, cut wound and lung problems (Table 3). *Centella asiatica, Azadirachta indica* and *Oscimum sanctum* were involved in treating common problems like fever, wounds, and cuts. Our result was in accordance with Choudhary & Ahirwar (2017) who reported that *Terminalia chebula* etc were used to address majority of diseases. In the current study also, *Terminalia chebula* was found useful in treating many diseases. It is used as an appetizer, to cure digestives and respiratory diseases. Residents preferred ethno-medicinal treatment for bone fracture, dislocation and skin diseases over modern treatment as the former shows no side effects.

We tried to analyze the main plant part which was highly useful in medicine preparations. Leaves (41%) were the plant part with maximum citations, followed by bark (25.5%), roots and seeds (18.6%), fruit (16.2%), stem (11.6%), whole plant and flower (7%) and others (2.5%); respectively (Fig. 3). In many plants, latex was also useful. Our results are similar to those of Ahirwar & Kapale (2014).

Preparation form included decoction, juice, paste, infusion and powder. Of the many different ways of preparations using plant parts, decoction, paste and powder were most commonly used. Raw or dried form were either administered as powder or as paste/lotion mixed with water/milk/honey. Raj et al. (2018) reported in their study that juice followed by paste and decoction was major form of preparation used in their study. In the present study the underground parts were mostly used in dried form (Fig. 4).

TABLE 2. Informant Consensus Factor for different ailments

S. no.	Ailment category	NUR	Nt	ICF
1	Circulatory system	7	3	0.66
2	Digestive system	70	18	0.75
3	Endocrine system	25	2	0.95
4	Immune system	10	6	0.44
5	Body's muscular system	11	4	0.7
6	Nervous system	16	6	0.66
7	Reproductive system	15	7	0.57
8	Skeletal system	5	3	0.5
9	Respiratory system	58	10	0.84
10	Urinary system	5	2	0.75
11	Skin or Integumentary system	48	14	0.72
12	Antidote/ Poison	4	3	0.33
13	Parasite/Worms	14	6	0.61

TABLE 3. Medicinal plants used by tribes in the Dindori District of Madhya Pradesh

S. no.	Scientific name	Part used	Preparation form	Medicinal use
1	*Acacia catechu* (L.f.) Willd.	Bark, heartwood	Decoction,	Skin disease especially eczema, asthma, cough, bronchitis, colic, diarrhea, stomatitis.
2	*Acacia leucophloea* (Roxb.) Willd.	Bark, gum, leaves	Wood powder with honey	Constipates and is useful in cough, expectorant, bronchitis, CNS depressant, decreases the nerve conductions
3	*Acacia nilotica* (L.) Delile	Stem, bark, gum	Decoction , crushed form	Tooth Problem, Stomach or throat discomfort
4	*Acacia pennata* (L.) Willd.	Leaves ,Bark ,Stem	Decoction, leaf juice mixed with milk, unprocessed stem sap and root bark juice, raw leaf	Asthma, bleeding gums, body pain, digestive disorder in infants, diarrhea, rheumatism.
5	*Aegle marmelos* (L.) Corrêa	Roots, Leaves and Fruit	Unprocessed fruit pulp juice, paste	Digestive problem
6	*Albizzia lebbek* Linn.	Seed, flower, bark, leaf	Decoction, paste	Inflammation of gums, leprosy
7	*Annona squamosa* L.	Leaf, seed, fruit	Ripe fruit pulp , decoction	Stomach disorders , anti-diabetic, urinary tract infection, tumor, anti-malaria
8	*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Bedd.	Gum, leaf , plant	Decoction, gum with milk,	Cough, cold, lactation, ear discharge
9	*Argemone mexicana* L.	Latex, leaf, stem	Infusion, Decoction	Malaria, jaundice, ulcer, leprosy, blisters, anti-inflammatory stomachaches, antidote to snake poison
10	*Andrographis paniculata* (Burm.f.) Nees	Leaf, underground stem	Powder, extract	Common cold, tonsillitis, acute bronchitis
11	*Asparagus racemosus* Willd.	Root	Powder	Cut and syphilis
12	*Azadirachta indica* A. Juss.	Bark, seed, leaf , flower	Decoction	Malaria, ulcer, paralysis, lice, body pain
13	*Boerhavia diffusa* L.	Leaves	Paste	Healing of cut, hurt, and wounds and jaundice, liver tonic
14	*Bauhinia variegata* L.	Bark	Decoction with honey	Wounds, ulcers, Asthma, dysentery, snakebite, indigestion, piles
15	*Bacopa monnieri* (L.) Wettst.	Whole plant	Paste with pepper	Lunacy and memory
16	*Buchanania lanzan* Spreng.	Leaf	Leaf paste with water	Constipation
17	*Butea monosperma* (Lam.) Taub.	Seeds	Paste	Herpes, Skin Disease, Jaundice, Vomiting
18	*Calotropis gigantea* (L.) Dryand.	Root , latex	Paste, milk	Bone Fracture, ring worm
19	*Carissa spinarum* L.	Root	powder	Cardiac Disorder
20	*Cassia fistula* L.	Leaf, fruit, seeds	Paste, juice	Skin diseases , pain, vomiting
21	*Centella asiatica* (L.) Urb.	Leaf	Paste	Memory loss

TABLE 3. Cont.

S. no.	Scientific name	Part used	Preparation form	Medicinal use
22	*Canavalia ensiformis* (L.) DC.	Fruits	Decoction	Hernia, swollen testis and pain
23	*Cynodon dactylon* (L.) Pers.	Leaf	Paste with *Jatrophas curcas* oil	Pain relief for cracked heals
24	*Dalbergia sissoo* DC.	Leaf	Paste with black piper seeds orally	Syphilis, gonorrhea
25	*Dioscorea bulbifera* L.	Tubers	Solution of tubers crushed in water	Jaundice
26	*Euphorbia hirta* L.	Whole Plant	Paste with Kurchi (*Holarrhenaantidysenterica*) and pepper.	Wound, dysentery, diarrhea
27	*Ficus benghalensis* L.	Prop root	Decoction, Twigs and leaves milk is mixed with 'Rai/ Mustard' oil externally massage	Chest ache
28	*Ficus religios* L.	Leaf	Paste in mustard oil	Swelling
29	*Gmelina arborea* Roxb.	Bark, Root,	Decoction, powder	Piles, abdominal pain, burning sensation, fever, headache, Respiratory problems
30	*Madhuca longifolia* (J. König ex L.) J.F.Macbr.	Fruit, Flower	Decoction	Delivery convalescence, toothache skin cracks, weakness
31	*Mangifera indica* L.	Bark	Decoction, juice	Jaundice, Headache, Malaria
32	*Ocimum sanctum* L.	Leaf, root, seed, whole plant	Fresh Juice, root decoction, seeds	Asthma, bronchitis, hiccough, fever, vomiting, skin disease, fever, cough, psychosis
33	*Piper longum* L.	Seed	Powder with honey	Syphilis
34	*Phyllanthus emblica* L.	Fruit	Powder with fresh rhizome decoction of *Zingiber roseum*.	Bronchial disorders
35	*Plumbago zeylanica* L.	Root, whole plant	Powder with honey, whole plant boiled with rai (*Brassica juncea*)	Indigestion, joint pain
36	*Semecarpus anacardium* L.f.	Fruit, seeds	Powder	Headache, Diarrhea, paralysis, Worms, Leg ache, Wound, Piles
37	*Syzygium cumini* L.	Bark	Powder	Jaundice, Gastric problems
38	*Tamarindus indica* L.	Leaf	Paste	Swelling
39	*Terminalia arjuna* (Roxb. ex DC.) Wight &Arn.	Bark	Powder	Weakness, mouth blister
40	*Terminalia chebula* Retz	Fruit ,	Baked powder	Digestion, Ulcer, Cough, Hiccups, Leprosy, Cardiac disorder, Wound, all most all diseases
41	*Trigonella foenum-graecum* L.	Seeds	Powder in sugar	Joint pain

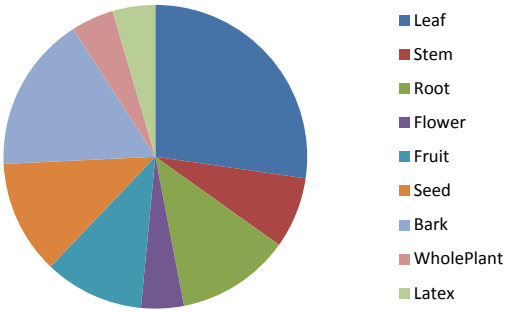

Fig. 3. Plant parts of medicinal plant species used in tribal communities

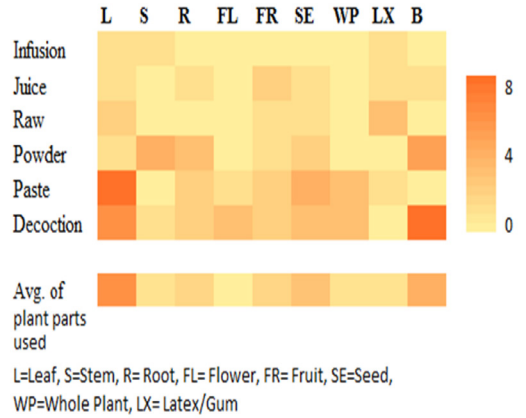

Fig. 4. Heat map for plant part and formulation used by the tribal people of Dindori district

Conclusion

In the present work, 41 medicinal species of 36 genera and 25 families were documented from the tribal community of the district of Dindori of Madhya Pradesh. Leaf was the most used plant part by the indigenous communities. Digestive disorders were found to be the most frequently encountered problems treated by medicinal plants. This was followed by pain, cut wound and lungs related problems. *Centella asiatica*, followed by *Terminalia* sp. and *Ocimum sanctum* have shown relatively higher Use Value signifying their high usage by the indigenous communities. Many plants reported in our study are also included in the endangered, frequent, planted, rare and sparse categories; and some are also listed in the conservation list of the Government of India. Many human diseases and ailments treated from these documented species can lead us to understand importance of this area in biodiversity conservation.

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