

Traditional Utilization and Harvesting of Medicinal Plants in Mandla District of Madhya Pradesh

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Abstract Utilization and harvesting practices of medicinal plants used by local people of Ghughri block in Mandla district of Madhya Pradesh was studied through questionnaire survey. The study resulted in the documentation of 43 medicinal plants of these 95% was used by traditional healers for curing various diseases. Tree species were used in maximum cases, followed by herbs and shrubs. Tree bark was the most used plant part for medicinal purpose, followed by root. In all studied villages, the quantities of medicinal plants collection for own consumption was higher than the quantity collected for sale. Species like *Embilica officinalis*, *Terminalia bellirica*, *Aegle marmelos*, *Semecarpus anacardium*, *Buchanania lanzan*, *Terminalia chebula*, and *Syzygium cumini* were mainly used by local people for own consumption and not for sale. There was almost consistency in collection of medicinal plants across the studied villages however the collection was determined by the season of species availability. Some species being rare and found in limited area was either not collected or collected by a few villagers. The findings of the study are further discussed in the sustainability perspective of medicinal plants and traditional healing systems.

Keywords: medicinal plants, harvesting practices, tribal community, Madhya Pradesh, Mandla district, traditional practices

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1. Introduction

The medicinal plants play an important role in the socio-cultural, spiritual and health care needs of communities across the world, as they occur in diverse ecosystems [1-7]. The Indian sub-continent is inhabited by large number of tribal communities, and they generally live in the forest and forest fringe areas [8,9,10,11]. These communities are mostly unable to access the formal health care systems due to several reasons including the high cost of modern medicine and unavailability of many such facilities in the remote rural areas hence they still fully or partially depend on the medicinal plants of their surrounding areas for health care [12,13].

The Indian state of Madhya Pradesh, wherein the present study was carried out, is inhabited by various tribal communities who are known to have accumulated a great amount of knowledge on the use of various plant species. Various forest types in this Indian state support number of medicinal plants [14,15,16,17]. Mandla district of Madhya Pradesh is one of the tribal dominated districts where the tribal communities mainly depend on forest resources, including medicinal plants for their livelihood and health care [18]. Though attempts have been made in the past by various researchers to document the medicinal plants, as utilized by the forest dwellers, less emphasis

was given to study utilization practices and harvesting mechanisms [16,19]. Though there are studies available in some parts of Madhya Pradesh [14,16,17,19], no study on the utilization of medicinal plants has been carried out yet in the Ghughri block of the Mandla district of Madhya Pradesh. The present study aims to document the medicinal plants, as utilized by the selected group of local people. Attempt was also made to identify various harvesting and utilization practices of medicinal plants.

2. Methodology

2.1. Study Area

Madhya Pradesh is located in the central part of India. The variation in the climate, soil and topographic features in the state resulted into diversity of its forests types and floristic composition. The intensive study area - Mandla is a tribal dominated district, situated in the east-central part of Madhya Pradesh. The area of the Mandla district is 8771 km². According to the 2012 census, population of the district is 779,414. It has 9 development blocks, 4 tehsil and 1214 villages. It lies between the latitude 22° 2' and 23° 22' north and longitude 80° 18' and 81° 50' east.

Mandla endows with rich forests. Some good forest area of Mandla district falls under Bicchiya tehsil, which constitutes of Bicchiya, Mohgaon, and Mawai and Ghughri development blocks. The present study was

conducted in the Ghughri block of Mandla district as it has diverse ethnic groups including Gond and Baigas and Medicinal plants wealth, as well. There were 96 villages in Ghughri block out of which three were forest villages and 93 were revenue village. Its total population was 78,690. Most of the village population was below poverty line [18].

2.2. Survey Methods

Literature survey was carried out for compilation of information on medicinal plants of the study area. Secondary information was also gathered from the forest officials of the Ghughri block. Besides, the forest officials at Ghughri were also interviewed on the collection practices of medicinal plants.

2.2.1. Household Survey

Out of 96 villages in Ghughri block 4 villages were selected for the collection of first hand information of which 2 were forests (e.g., Sajpani and Gorakhpur), and 2 were revenue villages (e.g., Gajraj and Chattarpur). Forest villages were situated in the forest and were looked after by the forest department while revenue villages were controlled by the revenue department. The extensive survey was conducted in the selected villages for documentation of medicinal plants, the plants part used in different therapies, traditional practices, quantity of medicinal plants collection, and medicinal plants trading. Random sampling was adopted for household survey and minimum 50 households at each selected village were approached for questionnaire survey.

2.2.2. Selection of the Target groups

Interviews of knowledgeable persons such as specialized traditional healers were also carried out for documentation of specific knowledge on medicinal plants from each of the selected village. These target groups

were selected on the basis of the possession and practice of their indigenous knowledge.

2.3. Data Analysis

The primary data as collected on traditional utilization of medicinal plants were analyzed by using parameters such as total medicinal plants collected for own consumption, and for sale. The list of medicinal plants, as used by the local people and traditional healers, was prepared and also a comparative statement was developed on the utilization of medicinal plants between traditional healers and common local people.

3. Results

3.1. Utilization of Medicinal Plants

A total 43 medicinal plants were documented during the present investigations those were utilized by the villagers and traditional healers of Ghughri block in Mandla district of Madhya Pradesh. Of these except two species 41 species were used by traditional healers and 12 species by common local people residing in the forest as well as non forest villages (Table 1). Maximum tree species were used, followed by herbs and shrubs (Figure 1). Various parts of these plant species were collected. Tree bark was the most used plant part for medicinal purpose (20%), followed by roots (18%). Rhizome stem and gum of species were also used for medicinal purpose (Figure 2). Edible fruits of many species such as *Aegle marmelos*, *Annona squamosa*, *Cassia fistula*, *Embilica tsjeriam*, *Gloriosa superba*, *Terminalia bellirica* and *Terminalia chebula* were also used for curing diseases. Almost all plant parts of *Azadirachta indica*, *Bauhinia tomentosa*, *Calotropis gigantea*, *Euphorbia hirta* and *Ocimum basilicum* were used by traditional healers for curing diseases.

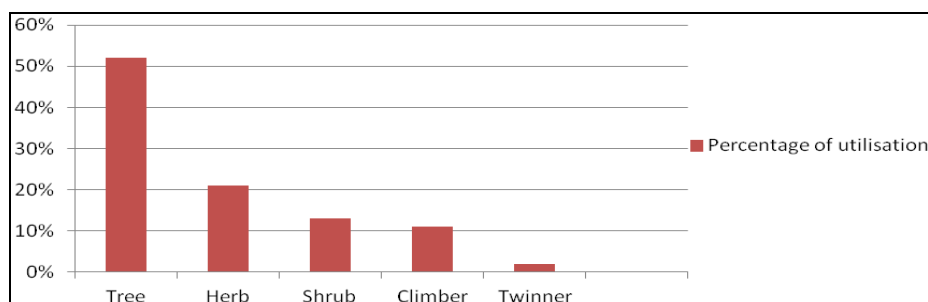


Figure 1. Percentage utilization of various life forms of medicinal plants

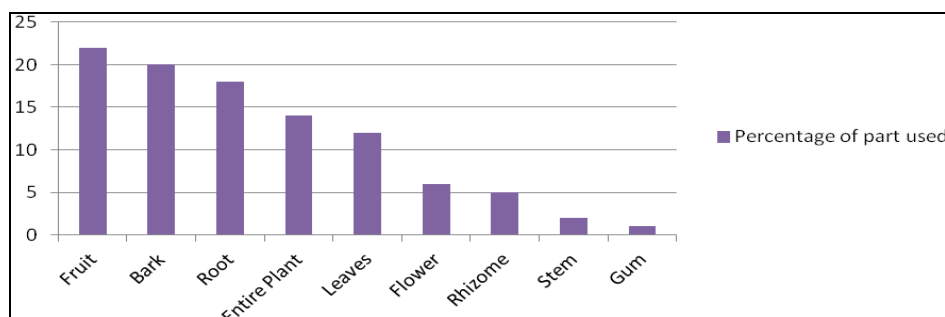


Figure 2. Plant parts of medicinal plants used by the villagers in the study area

Table 1. Utilization of medicinal plants in the Ghughri block of Mandla district in Madhya Pradesh

Sl. no	Plant species	Local name	Family	Availability		Utilized by		Part used	Indigenous uses
				Locality	Season	Traditional healers	Household		
1	<i>Abrus precatorius</i>	Gumchi	Fabaceae	Forest	Winter	Yes	No	Seed	Stomachache
2	<i>Acacia catechu</i>	Khair	Fabaceae	Forest	All season	Yes	No	Bark	Diarrhea, ulceration, antiseptic
3	<i>Acyranthus aspera</i>	Chirchita	Amaranthaceae	Forest	All season	Yes	No	Root	Scorpion and snake sting
4	<i>Aegle marmelos</i>	Bel	Rutaceae	Forest	Summer	Yes	Yes	Fruit	Diarrhea, constipation, typhoid, chronic
5	<i>Annona squamosa</i>	Chhitafal	Annonaceae	Cultivation	Summer	Yes	No	Leaves, fruit	Dysentery
6	<i>Anogeissus latifolia</i>	Dhawa	Combretaceae	Forest	All season	No	Yes	Bark, gum	Gum is having medicinal property and is edible
7	<i>Argemone maxicana</i>	Katayan	Papaveraceae	Forest	All season	Yes	No	Root	Recovery from heat strokes during summer
8	<i>Asparagus racemosus</i>	Satawar	Asparagaceae	Forest	All season	Yes	No	Root	Gastro intestinal disorder
9	<i>Azadirachta indica</i>	Neem	Meliaceae	Road side	All season	Yes	No	Entire plant	Antiseptic periodic, fever, ulcers, skin disease
10	<i>Bauhinia tomentosa</i>	Kachnar	Fabaceae	Forest	All season	Yes	No	Entire plant	Dysentery, tonic
11	<i>Boerhaavia chinensis</i>	Patharchita	Nyctanginaeae	Forest	All season	Yes	No	Entire plant	Jaundice, snake venom, anemia
12	<i>Buchanania lanzan</i>	Char	Anacardiaceae	Forest	Spring	Yes	Yes	Fruit	Used as substitute skin disease, diarrhea
13	<i>Butea monosperma</i>	Palash	Fabaceae	Forest	All season	Yes	No	Seed, bark, flower	Piles, menstruation disorder, diarrhea
14	<i>Calotropis gigantea</i>	Aak	Apocynaceae	Wasteland	All season	Yes	No	Entire plant	Fever, cough, skin disease
15	<i>Cassia fistula</i>	Amaltas	Fabaceae	Forest	All season	Yes	No	Fruit, flower	Constipation, piles, fever, gastric
16	<i>Cassia tora</i>	Chakoda	Fabaceae	Forest	Winter	Yes	Yes	Leaves	Cold cough
17	<i>Cissus quadrangularis</i>	Hadjod	Vitaceae	Forest	All season	Yes	No	Leaf, stem	Prescribed in scurvy for fractures cardeo-tonic
18	<i>Curcuma angustifolia</i>	Tikhur	Zingiberaceae	Forest	All season	Yes	No	Rhizome	Dysentery, stomachache, wounds
19	<i>Cylista scariosa</i>	Ban sem	Fabaceae	Forest	All season	Yes	No	Roots	Dysentery, leucorrhoea
20	<i>Cyperus scariosus</i>	Nagarmotha	Cyperaceae	River side	All season	Yes	No	Roots	Stomachache, ulcers
21	<i>Embelia tsjeriam</i>	Baibirang	Myrsinaceae	Forest	All season	Yes	No	Fruit	Stomachache, tonic
22	<i>Emblica officinalis</i>	Amla	Euphorbiaceae	Forest	Winter	Yes	Yes	Fruit	Edible, laxative
23	<i>Eranthemum purpurascens</i>	Van Tulsi	Acanthaceae	Forest	Winter	No	Yes	Seed	Cold cough, fever
24	<i>Eriolaena hookeriana</i>	Bothi	Malvaceae	Forest	All season	Yes	No	Root	Recovery from heat strokes during summer
25	<i>Euphorbia hirta</i>	Doodhi	Euphorbiaceae	Forest	All season	Yes	No	Entire plant	Dysentery, asthma
26	<i>Gloriosa superba</i>	Kalihari	Colchicaceae	Forest	Rainy	Yes	No	Rhizome	Cold, ulcers, piles
27	<i>Grewia tiliaefolia</i>	Dhaman	Malvaceae	Forest	All season	Yes	No	Bark, stem	Dysentery, cough, pain
28	<i>Gymnema sylvestre</i>	Gurmar	Asclepiadaceae	Forest	All season	Yes	No	Roots, leaves	Stimulant, heart disease, diabetes
29	<i>Madhuca indica</i>	Mahua	Sapotaceae	Forest	Summer	Yes	Yes	Fruit, flower	Bleeding gums, ulcers, diabetes
30	<i>Mucuna pruriens</i>	Kiwanch	Fabaceae	Forest	All season	Yes	No	Seed, roots	Tonic, stimulant, diuretic, diarrhea
31	<i>Ocimum basilicum</i>	Van tulsa	Lamiaceae	Wasteland	All season	Yes	No	Entire plant	Fever, cough, constipation
32	<i>Ricinus communis</i>	Andi, Arand	Euphorbiaceae	Forest	All season	Yes	No	Roots, seeds	Scorpion and snake sting
33	<i>Schleichera oleosa</i>	Kusum	Sapindaceae	Forest	All season	Yes	Yes	Seed oil, bark	Skin diseases, rheumatic pain, itches, ulcers
34	<i>Semecarpus anacardium</i>	Bhelwa	Anacardiaceae	Forest	Spring	Yes	Yes	Bark, seed	Asthma, diarrhea, dysentery, rheumatism
35	<i>Soymida febrifuga</i>	Rohan	Meliaceae	Forest	All season	Yes	No	Bark, resin	Diarrhea, dysentery, fever, tonic, malaria
36	<i>Sterculia urens</i>	Kullu	Malvaceae	Forest	All season	Yes	No	Bark, gum	Facilitate delivery, laxative, dental fixture
37	<i>Syzygium cumini</i>	Jamun	Myrtaceae	Forest	Summer	Yes	Yes	Fruit	Constipation, skin diseases, diarrhea
38	<i>Tephrosia purpurea</i>	Sarphonka	Fabaceae	Forest	All season	Yes	No	Leaves	Tonic, laxative, diarrhea
39	<i>Terminalia arjuna</i>	Arjuna	Combretaceae	River side	All season	Yes	No	Bark	Astringent, blood pressure
40	<i>Terminalia bellirica</i>	Baheda	Combretaceae	Forest	Spring	Yes	Yes	Fruit	Tonic, laxative
41	<i>Terminalia chebula</i>	Harra	Combretaceae	Forest	Spring	Yes	Yes	Fruit	Tonic, laxative, diuretic
42	<i>Woodfordia fruticosa</i>	Surteli	Lythraceae	Forest	All season	Yes	No	Entire plant	Diarrhea, dysentery
43	<i>Zizyphus mauritiana</i>	Ber	Rhamnaceae	Forest	Winter	Yes	No	Bark, fruit, seed	Diarrhea, dysentery

Table 2. Medicinal plants utilized by households of study area for own consumption and sale

S n	Species collected	% of collection by household							
		Sajpani		Gorakhpur		Gajraj		Chattarpur	
		For own consumption	For sale	For own consumption	For sale	For own consumption	For sale	For own consumption	For sale
1	<i>Aegle marmelos</i>	80%	0	100%	0	90%	0	95%	0
2	<i>Anogeissus latifolia</i>	100%	0	100%	0	100%	0	100%	0
3	<i>Buchanania lanzan</i>	30%	0	70%	8%	99%	0	88%	0
4	<i>Cassia tora</i>	100%	100%	100%	100%	90%	80%	90%	75%
5	<i>Embilica officinalis</i>	40%	0	50%	0	80%	0	70%	0
6	<i>Eranthemum purpurascens</i>	0%	100%	0%	80%	0	4%	0	0
7	<i>Madhuca indica</i>	100%	100%	100%	100%	100%	100%	100%	100%
8	<i>Schleichera oleosa</i>	16%	0	0%	0	0	0	0	0
9	<i>Semecarpus anacardium</i>	100%	20%	100%	12%	100%	0	98%	0
10	<i>Syzygium cumini</i>	60%	0	70%	0	80%	0	84%	0
11	<i>Terminalia bellirica</i>	100%	0	100%	0	70%	0	92%	0
12	<i>Terminalia chebula</i>	100%	0	100%	0	70%	0	88%	0

3.2. Harvesting and Post Harvesting of Medicinal Plants

Some medicinal plants were collected by local people for their own consumption while some medicinal plants were collected for both sale and own consumption (Table 2). In all studied villages, the quantities of medicinal plants collection for own consumption is higher than the quantity collected for sale. *Terminalia tomentosa*, *Anogeissus latifolia* and *Ougenia ooginensis* though having medicinal properties yet the maximum quantity of these species were utilized as fuel wood. Species like *Embilica officinalis*, *Terminalia bellirica*, *Aegle marmelos*, *Semecarpus anacardium*, *Buchanania lanzan*, *Terminalia chebula*, and *Syzygium cumini* were mainly used for own consumption and not for sale.

The local people generally preferred to go for selling the collected medicinal plants by weekly basis due to poor road connectivity, especially in the forest villages which were situated deep inside the forests. Species like *Madhuca indica*, *Cassia tora* and *Eranthemum purpurascens* were collected and sold out either through forest department or sometimes directly in the market. In

Chattarpur, *Eranthemum purpurascens* is not being collected for sale. Thus, here in this village out of the 4 species which is used as a source of income only 3 species were sold out on a weekly basis. Out of the studied villages, Gorakhpur was the only one which collected *Buchanania lanzan* for own consumption as well as for selling.

There was almost uniform pattern in collection of medicinal plants across the studied villages however the collection was determined by the season of specific species availability (Table 3). Some species being rare and found in limited area was either not collected or collected by a few villages. *Buchanania lanzan* was collected and utilized by the villagers of Gorakhpur for their own consumption as well as for selling whereas the villagers of Sajpani did not report its collection for sale. Since tree species was collected in majority of cases (52%) and trees being available round the year, the collection from such species remained operational in all seasons (Figure 3). The collection was done from 68% of species in all seasons, followed by summer (11%), winter (10%), spring (9%) and rainy seasons (2%). Being annual the occurrence of some species was determined by the season such as *Cassia tora*.

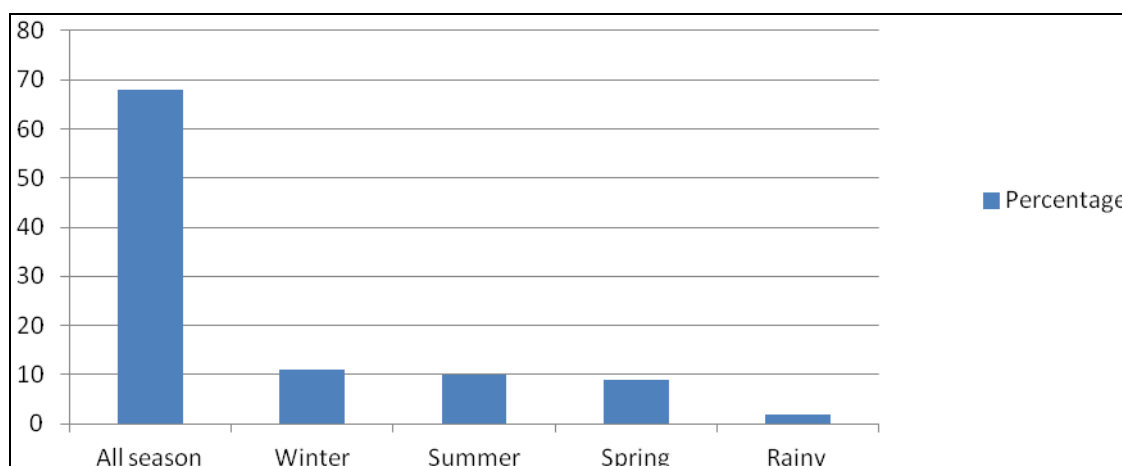


Figure 3. Seasonal availability (in percentage) of medicinal plants utilized by the villagers

Table 3. Seasonal harvesting pattern of medicinal plants utilized by the households in the studied villages of Mandla district

Sn	Local name	Season of harvesting											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Amla												
2	Baheda												
3	Bel												
4	Bhelwa												
5	Chakoda												
6	Char												
7	Dhawa												
8	Harra												
9	Jamun												
10	Kusum												
11	Mahua												
12	Van Tulsi												

4. Discussion

The local people of Ghughri block in Mandla district have been using medicinal plants growing in their surrounding village forests for curing various human diseases from antiquity. Though some of the medicinal plants were being collected and used by almost every household in the study area, there were specialized knowledge holders and traditional healers who used 95% of medicinal plants documented during the survey. The specialized knowledge holders mainly dealt to cure some specific disease not more than one or two such as snake bite, scorpion bite, malaria and jaundice whereas the commonly known diseases were cured by rest of the traditional healers. Of the total species used for curing diseases, 8 species such as *Aegle marmelos*, *Buchanania lanzan*, *Cassia tora*, *Terminalia bellirica*, *Terminalia chebula*, *Syzygium cumini*, *Semecarpus anacardium* and *Schleichera oleosa* were used by both household member and traditional healers, as well.

On an average 12 people per month visited traditional healers for treatments. The traditional healers and specialized knowledge holders, as well, were mainly visited for curing snake bite, scorpion bite, jaundice, delivery, skin diseases, diabetes, heart diseases, fever, malaria, diarrhea and dysentery. Some species were used for curing specific disease such as *Annona squamosa* was used for curing dysentery, *Acyranthus aspera* was used in scorpion and snake bite, *Abrus precatorious* was used for stomachache and *Argemon maxicana* was used for getting recovered from heat stroke. For the treatment of diarrhea, dysentery and constipation many species were discovered by healers including *Aegle marmelos*, *Acacia catechu*, *Mucuna pruriens*, *Soymida febrifuga*, *Syzygium cumini*, *Woodfordia fruticosa* and *Zizyphus mauritiana*. The healers also mixed up sugar and honey in preparing some herbal formulation.

Medicinal plants were collected mostly from the wild. Only a few households reported cultivation of some medicinal plant species. The collection pattern was almost similar across the villages. The collection practices of medicinal plants were also influenced by market forces hence premature collection was also rampant. The fruits of *Embilica officinalis* mature after December [4,19], but due to high demand in industries and intense competition among collectors, the harvesting was started in October only (Table 3). Lopping of branches of some medicinally important trees were also observed in the study area.

The local people had less concern about proper harvesting period of medicinal plants. The seasonal harvesting of medicinal plants in studied villages indicates that *Embilica officinalis*, *Buchanania lanzan*, *Terminalia chebula* and *Terminalia bellirica* were subjected to premature harvesting for collection of fruits. The actual harvesting season of these species is April to May, but people collected them in March and sometime even earlier. This suggests that villagers were not following the proper and traditional harvesting practices. The results of present study on harvesting practices do not fully corroborate with a study of Chauhan [20], which concluded that tribal people were aware of the necessity of the preservation and propagation of species. The study reveals the pressure on medicinal plants, due to illegal lopping and felling of important plant species. Overexploitation of forest by cutting and uprooting trees for easy and quick collection of medicinal plants may lead negative impacts on medicinal plants as well as the traditional health care system.

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