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Ethnomedicinal knowledge of Baiga and Gond Tribe and plant diversity in Jagmandal Forest, Mandla, India, with phytosociological diversity and utilization strategies

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Abstract. *Jhariya BL, Pawar M. 2024. Ethnomedicinal knowledge of Baiga and Gond Tribe and plant diversity in Jagmandal Forest, Mandla, India, with phytosociological diversity and utilization strategies. Asian J Ethnobiol 7: 13-21.* In the interior areas of the Mandla District, plants become the source of medicine because of a lack of facilities and remoteness. A medicinal exploration was made to find out the medicinal values of common plants present in the Jagmandal Forest of Mandla District (Mandla, India) during 2020-2023. During the survey, a total of 162 plant species belonging to 64 families were identified as being used for treatment of approximately 43 ailments or therapeutic indications which highest study done so far in the area. It has also been observed that more numbers of medicinal plants were recorded in the family Fabaceae. The majority of plant parts used to prepare treatments for various illnesses were leaves, as evidenced by the fact that leaves were the most often employed component of the plant against various diseases, followed by herbs (42%), trees (33%), climbers (14%), and shrubs (11%). The disease category with the highest ICF value (0.81) was the antiseptic. *Aloe vera*, *Achyranthus aspera*, and *Azadirachta indica* were highly preferred as treatments. More photochemical studies are needed before some of them can be used as drugs to benefit mankind. It is critical to explore, identify, and use new medicinal plants while also assisting in the conservation of existing but threatened species of rare medicinal plants in the area with the support of local communities.

Keywords: Ailments, conservation, local communities, Madhya Pradesh, Mandla, medicinal plant

INTRODUCTION

Forestry provides major and minor forest products and directly and indirectly meets forest dwellers' basic needs. Many communities, mainly those living in tribal-dominated areas, depend upon natural resources for food, materials for construction, firewood, medicines, and other purposes. Moreover, they use various wild plants and have evolved a distinct understanding of the forest's resources. Furthermore, they use diverse wild herbs and have developed a unique awareness of the forest's resources. These rituals, customs, totems, traditions, indigenous healthcare procedures, and other knowledge are passed down through traditional cultures from generation to generation. They are also key to understanding, using, and preserving plant resources. Local people worldwide have always been exceedingly-educated about the plants and other biodiversity on which they rely extensively. The capacity to retain ethnomedicinal traditional knowledge about the history of plants and animals in memory is a God gift for each tribal group's resource person. The tribe used most plant materials to extract forests nearby, including seeds, leaves, tubers, barks, and fruits. The demand for medicinal plants is estimated to be more than USD 14 billion annually, with a projected demand of USD 5 trillion by 2050 (WHO 2002). India has potential markets for medicinal products globally, but at the same time, these medically important plants face severe threats by unregulated and unsustainable harvesting practices. These will also impact the livelihood of dependent tribal communities of the area. In many societies, medicinal plants form the foundation of the healthcare system. Approximately 85% of traditional medicines used for basic healthcare globally are plant-based (Farnsworth et al. 2012). Up to 80% of people worldwide still rely on traditional medicine, and 65% of Indians in rural areas use ayurvedic and medicinal herbs for their basic healthcare demands (WHO 2002; Calderón 2006). Much of this treasure of knowledge is rapidly vanishing, and its potential uses in traditional culture are disappearing. One important concern of ethnomedicinal research is the potential use of plants as medicinal, which is often exclusive to specific communities and linked to the local flora. This knowledge is amassed by experimentation over thousands of years and passed down orally from generation to generation. The present study investigates and documents the medicinal plants as utilized by local communities in Jagmandal and Matiyari Reservoir, Bichhiya block, district Mandla; it also explores the role of weedy plants, especially herbs, which are major components of the traditional health care system and important in floral diversity. An attempt is also made to identify and categorize based on habit and utilization practices of medicinal plants.

MATERIALS AND METHODS

Study area

The Jagmandal forest areas, India consist of three forest ranges, Jagmandal, Bichhiya block, and Ghughri block of East Mandla forest division. These ranges consist of forest areas 24,987.77 ha, 7,410.90 ha, and 34,480.67, respectively. The forest areas also have six forest circles, 32 forest beats, and 124 forest villages. The Gond is the district's most predominant scheduled tribe, although Baiga comes in second, with Pradhan and Kol in third and fourth, respectively. Other tribes, such as Agariya, Andh, Bhaina, Bharia, Bhumia, Paliha, Pando, Pathari, and Saroti, have lower percentages.

Ethics statement and consent to participate

Oral informed consent was obtained before the initiation of data collection in all cases, both at the site level and individually before each interview. Additionally, informants were made aware that our goals were scientific rather than commercial. To participate in this study, participants gave verbal informed consent. They were free to withdraw their consent at any time.

Data collection

Documentation of ethnomedicinal plant data presented in this study was conducted from 2020 to 2022 in Jagmandal forest range villages of Mandla District. Plant specimens identified by standard method (Jain and Rao 1977; Pandey et al. 1991; Mudgal et al. 1997; Singh et al. 2001; Sankara et al. 2023) with their local names were identified with the help of flora of Madhya Pradesh by Verma et al. (1993), native local flora of Jabalpur District by Oommachan and Shrivastava (1996) and available literature. The threatened status of the plants was confirmed with the IUCN Red List and the help of available red data books and publications. Some other researchers who have contributed to the field of ethnobotany as Jain (1963), and Verma et al. (1995), Khan et al. (2008), Kanungo (2016), were also reviewed.

The present course of investigation was conducted through a direct approach involving a field survey in 23 villages situated and scattered in the Jagmandal forest area of the East Mandla forest division, India (Figure 1). They were considered for collecting indigenous tribal knowledge through primary data sources.

Data analysis

The ethnomedicinal survey results were examined using the following criteria: Use Value (UV), Plant Part Value (PPV), Fidelity Level (FL), and Informant Consensus Factor (ICF). The statistical analyses were carried out using Microsoft Excel 2010.

Use Value (UV)

The usage value of species (UV), a quantitative method for determining the relative importance of species known locally, was also determined using the following formula.

$$UV = Ui/N$$

Where Ui denotes the number of use reports indicated by each informant, and N represents the total number of informants questioned for a given plant species. It was estimated using the formula provided by Abe and Ohtani (2003).

Plant Part Value (PPV)

The plant part value (PPV) was determined using the following formula:

$$PPV = RU \text{ plant part}/RU$$

Where RU is the total number of uses recorded for all parts of the plant, and RU plant part is the sum of uses reported for each portion. The portion with the highest PPV is the most popular among the respondents.

Fidelity Level (FL)

Fidelity Level (FL) is the percentage of informants who acknowledged using certain plant species to treat a specific condition in the study location. The FL index is computed using this formula.

$$FL\ (\%) = IP/IU \times 100$$

Where IP is the number of informants who independently reported using a species for the same major ailment, and IU is the total number of informants who referenced the plant for any major ailment.

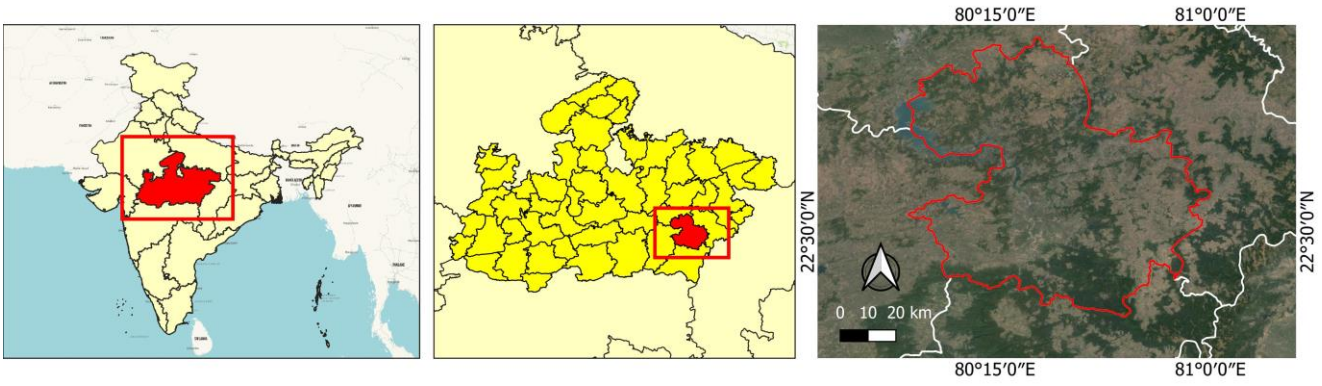

Figure 1. Map of the study area

Informant Consensus Factor (ICF)

It represents informants' consensus regarding using plant species to treat various illnesses (Yabrir et al. 2018).

ICF = (Nur-Nt) / Nur-1

Nur: The number of uses recorded for a certain disease category. Nt: The number of plant species utilized to treat that disease category. The factor's values vary from 0 to 1.

RESULTS AND DISCUSSION

The present investigation documented medicinal plant diversity and the utilization of forest resources in customary practices for curing and treating various diseases. During the investigation, 162 plant species from 60 families were identified as being used to treat around 43 diseases or therapeutic purposes. The Fabaceae family (24) had the most medicinal plants reported, followed by Liliaceae (14), Rubiaceae (8), Zingiberaceae (7), Apocynaceae(6), Asteraceae (6), Malvaceae (6), Cucurbitaceae (5), Caesalpiniaceae (4), Combretaceae (4), Poaceae (4), and Phyllanthaceae (3). Many plant species treat various diseases, including astringency, rheumatism, skin disease, diarrhea, laxatives, jaundice, diabetes, diuretics, purgatives, antidotes, and antipyretics. We attempted to assess the principal plant component useful in therapeutic formulations.

The most common plant types used to make remedies for various ailments were herbs (42%), trees (33%), climbers (14%), and shrubs (11%) (Figure 2). Pandey et al. (1991), Shukla and Pandey (1993), Shukla and Oommachan (1994), Rai et al. (1996), Rai and Nath (2005) and Jhariya (2006) all conducted ethnomedicinal investigations among various tribal populations in Mandla District.

The availability of several plant species for disease therapy may account for a high ICF. Dermatological disorders had the highest ICF value (0.67), followed by respiratory disease (0.63), gastrointestinal disorder (0.61), and fever (0.58) (see Table 1). The highest estimated ICF values imply that informants have the most consensuses about using specific medicinal plant species to treat a given disease. Use value assesses a species' importance to a local community; a higher usage rating indicates that the species is being used more extensively. The use value of a species represents its importance to a community in that location. A high utilization number indicates that the species is being over-exploited. However, a low utilization value may indicate a gradual loss of conventional wisdom on a particular taxon. The current study's utilization value range was 0.01-0.44 for the treatment of astringent (0.44), antipyretic (0.23), antidote (0.19), carminative (0.18), and diarrhea (0.18), as well as aphrodisiac (0.16), plants such as *Achyranthus aspera*, *Aloe vera*, *Azadirachta indica*, *Madhuca longifolia*, *Syzygium cumini*, *Ficus religiosa* and *Cleome viscosa* all have high utilization values. The high-use value species clearly indicate that common species are used to treat common ailments.

The Fidelity Value (FL) is a useful tool for determining which condition a specific species is more effective (see Table 3). For a given plant, an FL of 100% generally means that the same treatment method was reported in all use reports. Furthermore, it is not advisable to discard plants with low FL because doing so could raise the possibility of information gradually disappearing from the planet for future generations.

Periodic surveys and field data were used to compile a list of endemic, rare, and vulnerable medicinal plants. The IUCN red list category and threat assessment procedures for evaluating the status of medicinal plants were applied based on the threat area. Eleven vulnerable species, four near threatened, and six least concern species have been identified from the collected data in Table 2 with names of plant species, families, and aliments.

Table 1. Information Consensus Factor (ICF) of reported plant species against various ailments

Disease Category	Ailments	Nur	Nt	ICF
Blood & Tissue related Disorder	Anemia, Demulcent, Tumor, Diabetes	22	13	0.43
Body Energizers	Brain Tonic, Nutrient,	13	6	0.58
Dermatological Disorder	Antiseptic, Astringent, Emollient, Skin disease	94	32	0.67
Eye Nose mouth Related Disorder	Eye disease, Throat trouble, Ulcer	16	8	0.53
Fever	Antipyretic, Febrifuge, Malarial fever, Plague	30	13	0.59
Gastrointestinal Disorder	Carminative, Cathartic, Diarrhea, Jaundice, Kidney Stones, Laxative, Purgative, Vermifugo, Worms	137	54	0.61
Muscles Tissue	Rheumatism	14	13	0.08
Other	Antidote, Growth of Hair, Sedative	26	15	0.44
Respiratory Disease	Leprosy, Asthma, Cooling, Cough	28	10	0.67
Ureo genital Disorder	Abortifacient, Aphrodisiac, Diuretic, Emmenagogue, Leucorrhoea, Piles, Venerl disease, Sterility	47	27	0.43

Note: Nur: Number of uses reported for a particular disease category. Nt: Number of plant species used to treat that disease category; ICF: Informant Consensus Factor

Table 2. Ethnomedicinal diversity with aliments, botanical name, local name, family name and IUCN Status in Jagmandal Forest Range, Mandla Madhya Pradesh, India

Botanical Name	Family Name	Habit	Local Name	Ailments	IUCN Status
Abelmoschus manihot (L.) Medik.	Malvaceae	Herb	*Van-Bhindi*	Emmenagogue	Not Evaluated
Abrus precatorius L.	Fabaceae	Climber	*Ratti*	Purgative	Not Evaluated
Abutilon glaucum (Cav.) Sweet	Malvaceae	Shrub	*Kakai- Pandai*	Antipyretic	Not Evaluated
Achyranthes aspera L.	Amaranthaceae	Herb	*Chirchira*	Asthma, Baldness, Hair growth	Not Evaluated
Adhatoda vasica Nees	Acanthaceae	Tree	*Adusa*	Asthma, Antipyretic	Not Evaluated
Adiantum sp.	Polipodiaceae	Herb	*Hansra*	Emollient	Not Evaluated
Adina cordifolia (Roxb.) Brandis	Rubiaceae	Tree	*Haldu*	Febrifuge	Not Evaluated
Aegle marmelos (L.) Corrêa	Rutaceae	Tree	*Bel*	Diabetes, Diarrhoea	Near Threatened
Agave sisalana Perrine.	Agavaceae	Herb	*Kataki*	Antipyretic, Skin disease	Not Evaluated
Alangium salviifolium (L.f.) Wangerin.	Cornaceae	Tree	*Kankey*	Ulcer	Not Evaluated
Andrographis paniculata (Burm.f.) Wall. Ex Nees.	Liliaceae	Herb	*Kalmegh*	Malarial fever	Vulnerable
Antidesma acidum Retz.	Phyllanthaceae	Herb	*Khatta- amthi*	Antidote	Not Evaluated
Aristolochia indica L.	Aristolochiaceae	Shrub	*Easwarmool*	Antiseptic	Not Evaluated
Aristolochia littoralis Parodi	Aristolochiaceae	Climber	*Mushti*	Antipyretic	Not Evaluated
Asparagus racemosus Willd.	Asparagaceae	Climber	*Shatavar*	Aphrodisiac	Vulnerable
Asplenium sp.	Aspleniaceae	Climber	*Sankar-Jata*	Diuretic	Not Evaluated
Azanza lampas (Cav.) Alef.	Malvaceae	Shrub	*Van-Kapas*	Venereal disease	Not Evaluated
Bambusa bambos (L.) Voss	Poaceae	Herb	*Katang- Bans*	Cough	Not Evaluated
Bauhinia malabarica Roxb.	Caesalpiniaceae	Herb	*Amta*	Astringent	Not Evaluated
Bauhinia racemosa Lam.	Caesalpiniaceae	Tree	*Amthi*	Diarrhoea	Not Evaluated
Bauhinia ungustif L.	Caesalpiniaceae	Tree	*Kachnar*	Worms	Least Concern
Boerhavia diffusa L.	Nyctaginaceae	Tree	*Pathor-Chata*	Diuretic	Least Concern
Bombax ceiba L.	Malvaceae	Herb	*Semal*	Ulcer	Not Evaluated
Bonnaya tenuifolia (Colsm.) Spreng.	Linderniaceae	Herb	*Viskhapri*	Skin disease	Not Evaluated
Boswellia serrata Roxb.	Burseraceae	Tree	*Salai*	Rheumatism	Not Evaluated
Bridelia retusa (L.) A.Juss.	Phyllanthaceae	Tree	*Kasai*	Aphrodisiac	Not Evaluated
Buchanania lanzan Spreng.	Anacardiaceae	Tree	*Char*	Skin disease	Least Concern
Butea monosperma (Lam.) Kuntze.	Fabaceae	Tree	*Palas*	Diabetes, Tumor	Not Evaluated
Butea ungus Roxb. Ex Willd.	Fabaceae	Tree	*Palash-bel*	Astringent	Not Evaluated
Cajanus crassus (Prain ex King) Maesen	Fabaceae	Climber	*Vansemi*	Purgative	Not Evaluated
Careya herbacea Roxb.	Lecythidaceae	Climber	*Bhui – Kumhi*	Antipyretic	Not Evaluated
Cassia fistula L.	Liliaceae	Herb	*Amaltas*	Laxative	Least Concern
Catunaregam spinosa (Thunb.) Tirveng.	Rubiaceae	Tree	*Mainhar*	Ulcer	Not Evaluated
Celastrus paniculatus Willd.	Celastraceae	Tree	*Orangul, Malkangni*	Rheumatism	Not Evaluated
Centella asiatica (L.) Urb.	Apiaceae	Climber	*Bramhi*	Brain Tonic	Vulnerable
Chlorophytum tuberosum (Roxb.) Baker	Asparagaceae	Herb	*Safed- Musli*	Aphrodisiac	Vulnerable
Chloroxylon swietenia DC.	Rutaceae	Herb	*Bhirra*	Antiseptic	Not Evaluated
Citrullus colocynthis (L.) Schrad.	Cucurbitaceae	Tree	*Kadu- Kachria, Indrayan*	Jaundice	Not Evaluated
Coccinia grandis (L.) Voigt	Cucurbitaceae	Climber	*Jangli-Kundru*	Jaundice	Not Evaluated
Colocasia indica (Lour.) Kunth	Araceae	Herb	*Jangli – Arbi*	Antidote	Not Evaluated
Convolvulus arvensis L.	Convolvulaceae	Herb	*Hirankhuri*	Cathartic	Not Evaluated
Cordia macleodii (Griff.) Hook.f. & Thomson	Boraginaceae	Climber	*Silvat*	Jaundice	Not Evaluated
Crotalaria ramosissima Roxb.	Fabaceae	Tree	*Van San*	Purgative	Not Evaluated
Crotalaria spectabilis Roth	Fabaceae	Herb	*Van San*	Skin disease	Not Evaluated
Crotalaria verrucosa L.	Fabaceae	Herb	*Hardul*	Throat trouble	Not Evaluated
Cucumis trigonus Roxb.	Cucurbitaceae	Herb	*Indrawan*	Worms	Not Evaluated
Curculigo orchioides Gaertn.	Amaryllidaceae	Climber	*Kalimusli*	Jaundice	Not Evaluated
Curcuma aromatica Salisb.	Zingiberaceae	Herb	*Van- Haldi*	Carminative	Not Evaluated
Curcuma caesia Roxb.	Zingiberaceae	Herb	*Kalihaldi*	Asthma	Not Evaluated
Curcuma neilgherrensis Wight	Zingiberaceae	Herb	*Tikhur*	Cooling	Not Evaluated
Cuscuta reflexa Roxb.	Convolvulaceae	Herb	*Amerbel*	Demulcent	Not Evaluated
Cyperus rotundus L.	Cyperaceae	Climber	*Gangaua*	Venereal disease	Not Evaluated
Datura metel L.	Solanaceae	Herb	*Dhatura Kala*	Rheumatism	Not Evaluated
Dendrocalamus strictus (Roxb.) Nees	Poaceae	Herb	*Bans*	Astringent	Not Evaluated
Dendrophthoe falcata (L.f.) Ettingsh.	Loranthaceae	Shrub	*Bandha*	Astringent	Not Evaluated
Desmodium triflorum (L.) DC.	Fabaceae	Herb	*Van-Maithi*	Astringent	Not Evaluated

Dillenia pentagyna Roxb.	Liliaceae	Herb	*Karmal*	Laxative	Vulnerable
Dioscorea bulbifera L.	Dioscoreaceae	Herb	*Jarda-Kand*	Tonic	Near Threatened
Dioscorea hispida Dennst.	Liliaceae	Climber	*Bechandi*	Nutrient	Not Evaluated
Dioscorea pentaphylla L.	Liliaceae	Climber	*Kadu-Kand*	Piles, Worms	Not Evaluated
Diospyros melanoxylon Roxb.	Ebenaceae	Tree	*Tendu*	Diarrhoea	Not Evaluated
Diplocyclos palmatus (L.) C.Jeffrey	Cucurbitaceae	Climber	*Doker-Bel, Shivlingi*	Eye disease, Febrifuge	Not Evaluated
Drimia indica (Roxb.) Jessop.	Asparagaceae	Herb	*Jangli-Pyaj*	Eye disease, Kidney Stone, Piles, Skin disease	Vulnerable
Eclipta ungustif (L.) L.	Asteraceae	Herb	*Ghamra, bhiringaraj*	Rheumatism	Not Evaluated
Ehretia aspera Willd.	Boraginaceae	Herb	*Datranga*	Febrifuge	Not Evaluated
Elephantopus scaber L.	Asteraceae	Herb	*Van-tambaku*	Astringent	Not Evaluated
Embelia robusta Roxb.	Primulaceae	Herb	*Bibidang*	Worms	Not Evaluated
Eranthemum purpurascens Wight ex Nees.	Acanthaceae	Shrub	*Ban-Tulsi*	Asthma, Leucorrhoea	Not Evaluated
Eulaliopsis binata (Retz.) C.E.Hubb.	Poaceae	Shrub	*Soom- Ghans*	Antidote	Not Evaluated
Euphorbia hirta L.	Euphorbiaceae	Herb	*Doodhi*	Diarrhoea	Least Concern
Evolvulus alsinoides (L.) L.	Convolvulaceae	Herb	*Shankh-puspi*	Brain Tonic	Not Evaluated
Ficus hispida L.f.	Liliaceae	Tree	*Bhuin gular, Daduri*	Laxative	Not Evaluated
Flemingia macrophylla (Willd.) Kuntze ex Merr.	Fabaceae	Shrub	*Bhaisatad Kala*	Ulcer	Not Evaluated
Flemingia semialata Roxb. Ex W.T.Aiton	Fabaceae	Tree	*Vanchana*	Astringent	Not Evaluated
Flemingia strobilifera (L.) W.T.Aiton	Fabaceae	Shrub	*Bhaisakand Safed*	Aphrodisiac	Not Evaluated
Gardenia latifolia Aiton	Rubiaceae	Tree	*Papde, Paniabellow*	Astringent	Not Evaluated
Globba marantina L.	Zingiberaceae	Herb	*Gangi*	Carminative	Not Evaluated
Gloriosa superb L.	Liliaceae	Herb	*Kalihari*	Abortifacient	Vulnerable
Grona heterocarpos (L.) H.Ohashi & K.Ohashi	Fabaceae	Herb	*Char Patti*	Diabetes	Not Evaluated
Guilandina bonduc L.	Caesalpiniaceae	Climber	*Gataran*	Febrifuge	Not Evaluated
Gymnema sylvestre (Retz.) R.Br. ex Sm.	Apocynaceae	Herb	*Gudmar*	Diabetes	Vulnerable
Helicteres isora L.	Sterculiaceae	Climber	*Marod – Phalli*	Diarrhoea	Not Evaluated
Hellenia speciosa (J.Koenig) S.R.Dutta	Zingiberaceae	Shrub	*Keokand*	Astringent	Not Evaluated
Hemidesmus indicus (L.) R.Br.	Apocynaceae	Shrub	*Anantmul*	Antipyretic	Not Evaluated
Hibiscus sabdariffa L.	Malvaceae	Herb	*Aamadi*	Diuretic	Not Evaluated
Holarrhena pubescens Wall. Ex G.Don	Apocynaceae	Tree	*Dhudhi, Katuj*	Diarrhoea	Not Evaluated
Indigofera oblongifolia Forssk.	Fabaceae	Tree	-	Antidote	Not Evaluated
Jatropha curcas L.	Euphorbiaceae	Shrub	*Ratanjot*	Skin disease	Not Evaluated
Lannea coromandelica (Houtt.) Merr.	Liliaceae	Herb	*Gunja*	Laxative	Not Evaluated
Lawsonia inermis L.	Lythraceae	Tree	*Mehndi*	Growth of hair	Not Evaluated
Litsea glutinosa (Lour.) C.B.Rob.	Lauraceae	Herb	*Maida*	Diarrhoea	Vulnerable
Madhuca longifolia (L.) J.F.Macbr.	Sapotaceae	Tree	*Mahua*	Skin disease	Not Evaluated
Mangifera indica L.	Anacardiaceae	Tree	*Aam*	Diabetes, Jaundice	Not Evaluated
Miliusa tomentosa (Roxb.) Finet & Gagnep.	Annonaceae	Tree	*Kari*	Cathartic	Not Evaluated
Mimosa pudica L.	Mimosaceae	Herb	*Lajwanti*	Diuretic	Not Evaluated
Mitragyna parvifolia (Roxb.) Korth.	Rubiaceae	Tree	*Mundi*	Skin disease	Not Evaluated
Mucuna pruriens (L.) DC.	Fabaceae	Shrub	*Kiwanch*	Aphrodisiac	Not Evaluated
Nelumbo nucifera Gaertn.	Liliaceae	Climber	*Kamal*	Piles	Not Evaluated
Nyctanthes arbor-tristis L.	Oleaceae	Herb	*Harshaingar*	Rheumatism	Not Evaluated
Olax scandens Roxb.	Olacaceae	Tree	*Hardull*	Aneamia	Not Evaluated
Oroxylum indicum (L.) Kurz	Bignoniaceae	Tree	*San-padhar, Jai Mangal*	Carminative	Not Evaluated
Oxalis corniculata L.	Oxialidacceae	Tree	*Amroolsag*	Plugo	Not Evaluated
Pavetta indica L.	Rubiaceae	Herb	*Narisa*	Rheumatism	Not Evaluated
Pennisetum alopecuroides (L.) Spreng.	Poaceae	Herb	*Gangerua*	Antidote	Not Evaluated
Pergularia daemia (Forssk.) Chiov.	Apocynaceae	Climber	*Dudhibel*	Rheumatism	Not Evaluated
Peristrophe bicalyculata (Retz.) Nees	Acanthaceae	Herb	-	Antidote	Not Evaluated
Peucedanum nagpurense (C.B.Clarke) Prain	Apiaceae	Herb	*Tejraj*	Demulcent	Not Evaluated
Phyllanthus emblica L.	Liliaceae	Tree	*Amla*	Laxative	Least Concern
Phyllanthus urinaria L.	Phyllanthaceae	Herb	*Lal Bhui- Amla*	Jaundice	Not Evaluated
Plumbago zeylanica L.	Plumbaginaceae	Herb	*Chitrak*	Abortifacient, Skin disease, Women Sterility	Not Evaluated

Pterocarpus marsupium Roxb.	Fabaceae	Tree	*Bija*	Diabetes	Near Threatened
Pueraria ungusti (Roxb. Ex Willd.) DC.	Fabaceae	Tree	*Ghorbal*	Demulcent, Emmenagogue	Not Evaluated
Randia uliginosa (Retz.) Poir.	Rubiaceae	Tree	*Kalapathar*	Cathartic	Not Evaluated
Ricinus communis L.	Euphorbiaceae	Tree	*Arandi*	Purgative	Not Evaluated
Schleichera oleosa (Lour.) Oken.	Sapindaceae	Tree	*Kusum*	Skin disease	Not Evaluated
Schrebera swietenioides Roxb.	Liliaceae	Tree	*Harakatul*	Leprosy	Not Evaluated
Semecarpus anacardium L.f.	Anacardiaceae	Tree	*Bhilma*	Cough, Rheumatism	Not Evaluated
Senna occidentalis (L.) Link.	Fabaceae	Tree	*Kasondhi*	Purgative	Not Evaluated
Senna tora (L.) Roxb.	Fabaceae	Herb	*Chakoda*	Purgative	Not Evaluated
Shorea robusta C.F.Gaertn.	Dipterocarpaceae	Herb	*Sal*	Astringent	Not Evaluated
Sida cordifolia L.	Malvaceae	Tree	*Khareta*	Diuretic, Rheumatism	Not Evaluated
Smilax zeylanica L.	Smilacaceae	Herb	*Ram–datun*	Rheumatism	Not Evaluated
Solanum melongena L.	Solanaceae	Herb	*Banbhata*	Throat trouble	Not Evaluated
Solanum melongena subsp. *Melongena*	Solanaceae	Herb	*Barhatta*	Purgative	Not Evaluated
Solanum virginianum L.	Liliaceae	Herb	*Bhat kataiya*	Piles, Purgative	Not Evaluated
Sonchus oleraceus L.	Asteraceae	Herb	*Dudhi*	Cough	Not Evaluated
Soymida febrifuga (Roxb.) A.Juss.	Meliaceae	Herb	*Rohan*	Diarrhoea	Not Evaluated
Sphaeranthus indicus L.	Asteraceae	Tree	*Gorakh-Mundi*	Antiseptic	Not Evaluated
Sterculia urens Roxb.	Liliaceae	Herb	*Kurllu*	Laxative	Not Evaluated
Sterculia villosa Roxb. Ex Sm.	Liliaceae	Tree	*Kinhi*	Laxative	Not Evaluated
Stereospermum chelonoides (L.f.) DC.	Bignoniaceae	Tree	*Ghata*	Diuretic	Not Evaluated
Swertia angustifolia Buch.-Ham. Ex D.Don	Gentianaceae	Tree	*Chirayata*	Antipyretic	Not Evaluated
Syzygium cumini (L.) Skeels	Myrtaceae	Herb	*Jamun*	Diabetes, Jaundice	Not Evaluated
Tamarindus indica L.	Fabaceae	Tree	*Emli*	Skin disease	Not Evaluated
Tamilnadia uliginosa (Retz.) Tirveng. & Sastre	Rubiaceae	Tree	*Safed-Katul*	Diarrhoea	Not Evaluated
Tectona grandis L.f.	Lamiaceae	Tree	*Sagoun*	Antiseptic	Not Evaluated
Tephrosia purpurea (L.) Pers.	Fabaceae	Herb	*Van-Kulthi*	Kidney Stone	Not Evaluated
Tephrosia villosa (L.) Pers.	Fabaceae	Herb	*Van – Kulthi*	Diabetes	Not Evaluated
Terminalia anogeissiana Gere & Boatwr.	Combretaceae	Tree	*Dhawa*	Venereal disease	Near Threatened
Terminalia arjuna (Roxb. Ex DC.) Wight & Arn.	Combretaceae	Tree	*Arjun*	Astringent	Not Evaluated
Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Tree	*Baheda*	Cough, Laxative	Not Evaluated
Terminalia chebula Retz.	Liliaceae	Tree	*Harra*	Laxative	Not Evaluated
Terminalia elliptica Willd.	Combretaceae	Tree	*Saja*	Rheumatism	Not Evaluated
Thalictrum foliolosum DC.	Liliaceae	Tree	*Mumri*	Piles	Vulnerable
Themeda quadrivalvis (L.) Kuntze.	Liliaceae	Herb	*Ghonad*	Laxative	Not Evaluated
Thymus linearis Benth.	Lamiaceae	Herb	*Van-Ajvine*	Vermifugo	Not Evaluated
Tribulus pentandrus Forssk.	Zygophyllaceae	Shrub	*Ondhi*	Diuretic	Not Evaluated
Trichosanthes bracteata (Lam.) Voigt	Cucurbitaceae	Herb	*Lal-Indrayan*	Jaundice	Not Evaluated
Tridax procumbens L.	Asteraceae	Herb	*Patharchatta*	Astringent	Not Evaluated
Uraria lagopodioides (L.) DC.	Fabaceae	Herb	*Gahua*	Astringent	Not Evaluated
Uraria picta (Jacq.) Desv. Ex DC.	Fabaceae	Tree	*Patvan*	Antidote	Vulnerable
Vachellia nilotica (L.) P.J.H.Hurter & Mabb.	Fabaceae	Tree	*Babool*	Diarrhoea, Vomiting, Loose Motion	Not Evaluated
Vallaris solanacea (Roth ex Roem. & Schult.) Kuntze.	Apocynaceae	Climber	*Duddebel*	Skin disease	Not Evaluated
Ventilago ungustifol Willd.	Rhamnaceae	Climber	*Papadebel, Keotibel*	Carminative	Not Evaluated
Vitex negundo L.	Lamiaceae	Climber	*Nirgundi*	Rheumatism	Not Evaluated
Wendlandia exserta DC.	Rubiaceae	Tree	*Tilwan*	Astringent	Not Evaluated
Woodfordia fruticosa (L.) Kurz	Lytheaaceae	Shrub	*Surtili*	Diarrhoea,Jaundice	Not Evaluated
Wrightia tinctoria (Roxb.) R.Br.	Apocynaceae	Tree	*Badi-Dodhi*	Astringent	Not Evaluated
Xanthium strumarium L.	Asteraceae	Herb	*Gokhru*	Rheumatism, Sedative	Not Evaluated
Zingiber capitatum Roxb.	Zingiberaceae	Herb	*Ganjal*	Carminative	Not Evaluated
Zingiber montanum (J.Koenig) Link ex A.Dietr.	Zingiberaceae	Herb	*Van-Adarak*	Carminative	Not Evaluated
Ziziphus nummularia (Burm.f.) Wight & Arn.	Rhamnaceae	Shrub	*Ghatol*	Diuretic	Not Evaluated

Table 3. UV and FL Value by categories for treating diseases

Aliments	UV	FL
Abortifacient	0.03	3.3
Anaemia	0.02	2.2
Antidote	0.19	18.9
Antipyretic	0.23	23.3
Antiseptic	0.14	14.4
Aphrodisiac	0.17	16.7
Asthma	0.14	14.4
Astringent	0.44	44.4
Brain Tonic	0.09	8.9
Carminative	0.18	17.8
Cathartic	0.07	6.7
Cooling	0.02	2.2
Cough	0.13	13.3
Demulcent	0.04	4.4
Diabetes	0.16	15.6
Diarrhoea	0.18	17.8
Diuretic	0.14	14.4
Emmenagogue	0.02	2.2
Emollient	0.02	2.2
Eye disease	0.04	4.4
Febrifuge	0.06	5.6
Growth of hair	0.08	7.8
Jaundice	0.14	14.4
Kindney Stones	0.03	3.3
Laxative	0.16	15.6
Leprosy	0.01	1.1
Leucorrhoea	0.01	1.1
Malarial faver	0.03	3.3
Nutrient	0.03	3.3
Piles	0.08	7.8
Plugo	0.01	1.1
Purgative	0.09	8.9
Rheumatism	0.16	15.6
Sedative	0.02	2.2
Skin disease	0.14	14.4
Throat trouble	0.02	2.2
Tonic	0.03	3.3
Tumor	0.02	2.2
Ulcer	0.04	4.4
Venereal disease	0.04	4.4
Vermifugo	0.01	1.1
Women Sterility	0.02	2.2
Worms	0.08	7.8

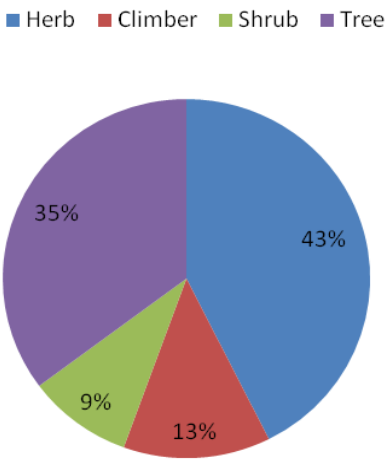

Figure 2. The analysis of habit- wise utilization

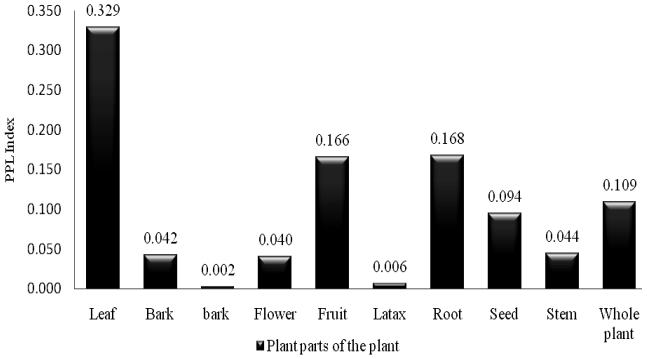

Figure 3. The utilization pattern of plants species

Due to the region's high diversity and plant species richness, many native species classified as weeds have found relevance in the traditional medicine system. Fresh leaves (0.329), roots (0.168), and fruit (0.166) have the highest PPV value as compared to other plant parts (see Figure 3). Herbs are the most commonly used plant, but for various reasons and modern medical facilities, the community's understanding of the forest varied, and younger generations were less knowledgeable. Out of 162 species listed here, 69 herbs are used as a medicine in folk treatment. It is also noted that herbs are important to most medicinal practices. Herb availability is also decreasing, posing a significant threat to these ecologically and culturally important plant groups. The harvesting practices of some economically important species, such as *Swertia angustifolia*, *Senna tora*, *Diospyros melanoxylon*, and *Phyllanthus emblica*, are important in terms of not only economically but ecologically as well in the long term. *Terminalia elliptica*, *Terminalia anogeissiana*, and *Dalbergia oojeinensis*, though having medicinal properties, the maximum quantity of these species were used as fuel wood, and less concern about the proper harvesting and regeneration of species in the region. High demand of *Andrographis paniculata*, *Chlorophytum tuberosum* are the most overexploited plant species in the area and is currently disappearing in most of the district's forest-dominated area. Other commonly traded medicinal plants in the area include *Buchanania lanzan*, *Terminalia bellirica*, *P. emblica*, *Plumbago zeylanica*, *Terminalia chebula*, *Smilax zeylanica*, *Uraria picta*, and *Vallaris solanacea* 20-30% households occasionally sell the components of medicinal plants as a means of generating revenue.

Traditional healthcare systems emphasize the importance of a plant-based diet such as *M. longifolia*, *Catunaregam spinosa*, *Bauhinia racemosa*, *Coccinia grandis*, *Dendrocalamus strictus*, *Dioscorea bulbifera*, *Dioscorea hispida*, *Drimia indica*, *P. emblica*, *Semecarpus anacardium*, *S. tora* and *S. cumini* for maintaining health and preventing illness. Certain medicinal plants are incorporated into daily meals or consumed as dietary supplements to promote overall well-being and strengthen the body's natural defenses. Many valued and economically minor forest products, non-timber forest products, and medicinal plants have become locally rare and endangered

or on the verge of extinction due to increased market demand over indigenous peoples' exploitation and unregulated harvesting of medicinal plants.

Forests, which include all plants, plant parts, and their products found in forest areas, have direct and indirect effects on the lives of local communities, tribes, forest dwellers, and many other underprivileged groups of people. These groups' sociological systems, customs, cultures, and lifestyles are likewise inextricably linked to the forest. Forest products were used for food, fodder, medicine, fuel, gum, agriculture, aromatic oils, defense equipment, musical instruments, rope, timber, and other social-religious objectives such as self-sustenance, daily requirements, and self-consumption. Nearly sixty percent of products are consumed by individuals, while surplus produce benefits local communities by increasing market sales and livelihoods. As is well established, local people are well aware of the flora and natural resources they rely on. Because of insufficient documentation, ethnoecological knowledge is quickly lost in traditional systems. Ethnomedicinal research can help uncover conservation difficulties, harvesting practices, and regeneration. The documentation process will assist local communities in preserving their ethnomedicinal legacy, fostering pride in local cultural knowledge and practices, and strengthening the links between communities and forests. Ethnobotanical and medicinal studies in Madhya Pradesh and Mandla include those by Chopra et al. (1956), Jain (1965), Brijlal and Dubey (1992), Oommachan and Saini (1993), Shukla and Oommachan (1994), Tiwari et al. (1996), Rai et al. (2001), Rai and Nath (2005), Khan et al. (2008), and Sahu (2010). However, there are studies available in some parts of Mandla done in the past (Sanghi 2013; Shrivastava 2013; Tiwari and Tiwari 2014; Sandya and Sandya 2015; Kanungo 2016; Javed 2017; Prasad 2022; Singh et al. 2022). Some studies done in Mandla on ethnomedicinal by Shrivastava (2013) reported 16 species from selected villages of the Bichhiya block, and Sandya and Sandya (2015) reported 30 species from the Mandla District. The present course of study will help to investigate existing ethnomedicinal knowledge of Baiga and Gond communities in the area and the status of diversity in the forest. Practical skills of the traditional knowledge holder and medicinal practitioners on botanical knowledge of plant species and their ecology are important. Therefore, involvement in local communities would be a great approach to conserve and restore plant species, which further help, support livelihood and rehabilitate the degraded lands.

In conclusion, local communities have valuable conservation knowledge that has helped preserve various forest types and species and, as a result, will help maintain the diversity of tree and floral species in the area. Many of the plants included in our study are also classified as endangered, common, planted, rare, or restricted in the area, and some are on the state's conservation list. Many human diseases and afflictions addressed by these described species can help us comprehend the value of this area in biodiversity conservation, and communities play critical roles in biodiversity conservation. However, there is a dilemma because these people also guide rural development initiatives, and the government focuses more on revenue-generating programs. In some cases, local communities are not aware of the sustainable harvesting practices of these plant species. Therefore, conservation focus must shift toward a community-centric approach where the community sustainably uses natural resources. Understanding and dealing with restoration and conservation efforts, human-wildlife interactions, land use change and urbanization, extraction of resources and exploitation, climate change, invasive species, and policies and regulations are critical for promoting sustainable development and maintaining ecological diversity, even in ecologically autonomous communities.

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