Ethnomedicinal Study of Malvaceae Family in Chhatarpur District (M.P.), India: A Quantitative Ethnobotanical Approach

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***Abstract*—This study investigates the ethnomedicinal uses of the Malvaceae family among rural and tribal communities in Chhatarpur District, Madhya Pradesh. Data were collected through interviews with 120 informants from 15 villages across four ecological zones. A total of 30 species were recorded and analyzed using Use Value (UV), Fidelity Level (FL), and Informant Consensus Factor (ICF). High UV values were recorded for *Sida cordifolia*, *Abelmoschus moschatus*, and *Gossypium herbaceum*. The findings emphasize the high dependence on Malvaceae plants for primary healthcare and highlight the need for conservation and pharmacological validation.**

***Index Terms*—Ethnomedicine, Malvaceae, Chhatarpur, Use Value, Fidelity Level, Indigenous Knowledge**

1. INTRODUCTION

The use of plants for healing purposes is a long-standing tradition that continues to form a part of the primary health system for rural and tribal populations globally (Calixto, 2005; Heinrich et al., 2009). In India, ethnobotanical knowledge forms the basis of many traditional systems like Ayurveda and Siddha (Mukherjee & Wahile, 2006). The Malvaceae family comprises over 240 genera and 4,200 species distributed mainly in tropical and subtropical regions (Heywood et al., 2007). Several species like *Sida cordifolia*, *Abelmoschus esculentus*, and *Thespesia populnea* are traditionally used for ailments such as fever, inflammation, and wound healing (Kirtikar & Basu, 2005; Warrier et al., 1994; Adhikari et al., 2021).

Chhatarpur district in Madhya Pradesh, part of the Bundelkhand plateau, is ecologically diverse and home to tribal communities like Gond, Kol, and Sahariya who rely on traditional medicine (Jain, 1963; Bhattacharya & Pal, 2014). However, ethnomedicinal knowledge is eroding due to modernization and lack of documentation (Reddy et al., 2008). Hence, this study aims to systematically document and analyze the ethnomedicinal applications of Malvaceae plants in this region using established quantitative ethnobotanical methods (Trotter & Logan, 1986; Phillips & Gentry, 1993).

2. MATERIALS AND METHODS

2.1 Study Area

The study was carried out in Chhatarpur district (24°03′N, 79°23′E), Madhya Pradesh, encompassing the blocks of Maharajpur, Lavkushnagar, Chandla, and Barigarh. The climate is semi-arid with an average rainfall of 850 mm, and the vegetation includes tropical dry deciduous forests (Champion & Seth, 1968).

2.2 Data Collection

Fieldwork was conducted from June to December 2024. A total of 120 informants (73 male and 47 female), including traditional healers (Baidhyas), farmers, and elderly locals, were interviewed using semi- structured questionnaires, free listing, and group discussions (Martin, 1995). Snowball sampling was used to identify knowledgeable individuals (Albuquerque et al., 2007).

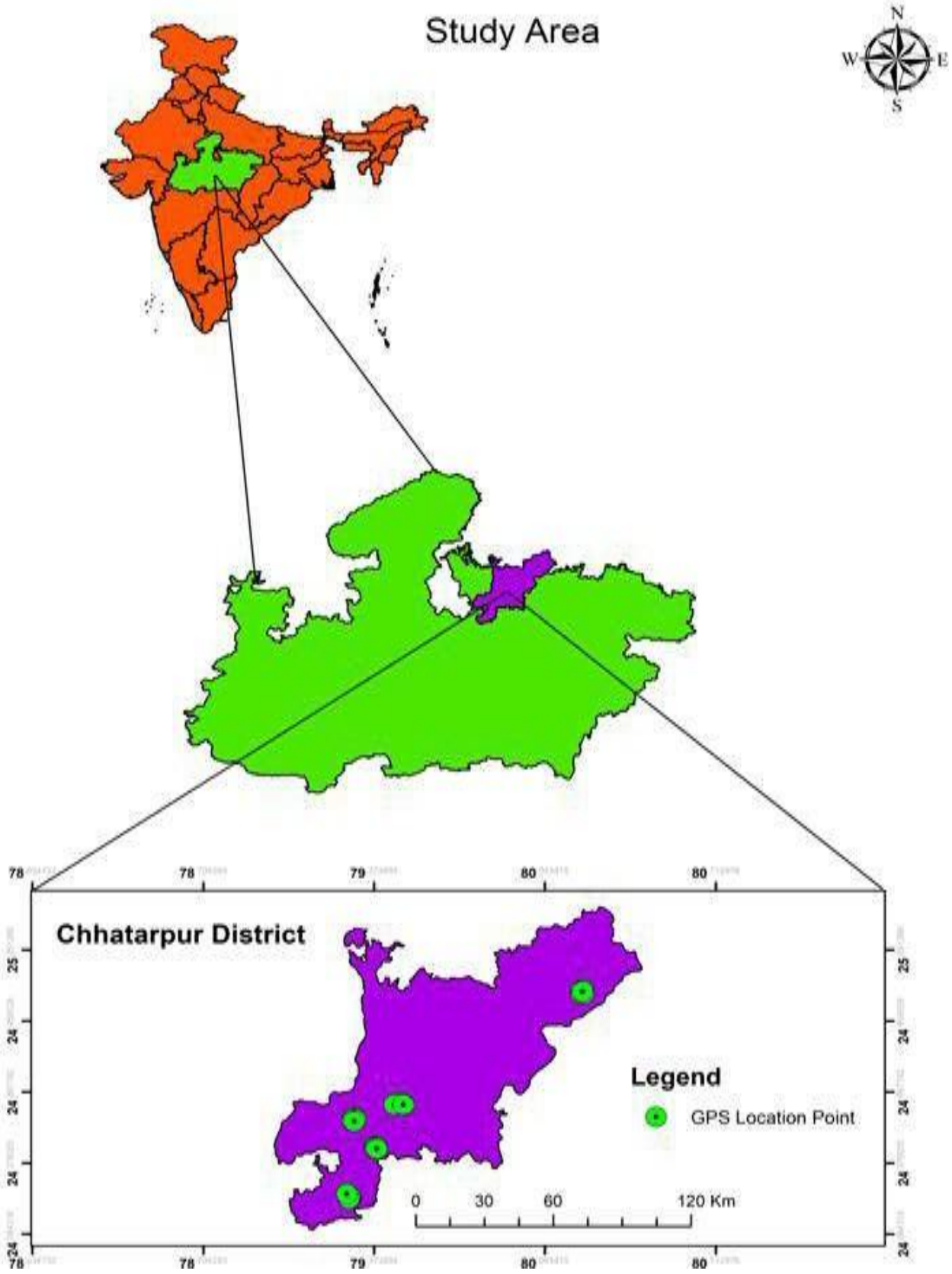

Fig1: - Study Area Location

2.3 Plant Identification

Voucher specimens were collected and identified with the help of regional floras (Sharma, 2003) and confirmed at the University Herbarium of Dr. Harisingh Gour Vishwavidyalaya, Sagar, Madhya Pradesh. All specimens were preserved in the herbarium of the Department of Botany, MCBU, Chhatarpur.

2.4 Quantitative Analysis

Standard Quantitative ethnobotanical analysis was done for the present study as follows: -

1. NT – Number of Taxa

The Number of Taxa (NT) is the total number of different plant species recorded during the ethnobotanical study. Each unique plant species documented for medicinal purposes is considered one taxa.

2. FIC – Factor of Informant Consensus

The Factor of Informant Consensus (FIC) indicates the agreement among informants on the use of plants for treating a specific disease category (Trotter & Logan, 1986; Heinrich et al., 1998).

Formula:

FIC = (Nur - Nt) / (Nur - 1) Where:

- Nur = Number of use-reports for a particular ailment category Nt = Number of species used for that category

3. UV – Use Value

Use Value (UV) reflects the relative importance of plant species based on the number of uses mentioned by informants (Phillips & Gentry, 1993; Tardío & Pardo-de-Santayana, 2008).

Formula:

UV = ∑Ui / N Where:

- ∑Ui = Total number of use-reports per species
- N = Number of informants

4. FL – Fidelity Level

Fidelity Level (FL) shows the percentage of informants who agree on the use of a plant species for treating a specific ailment (Friedman et al., 1986; Alexiades & Sheldon, 1996).

Formula:

FL (%) = (Np / N) × 100

Where:

- Np = Number of informants reporting the plant for a specific ailment
- N = Total number of informants who mentioned the plant

5. Jaccard Index (JI)

The Jaccard Index (JI) measures the similarity of plant species used between two different regions or study areas.

Formula:

JI = (c / (a + b - c)) × 100

Where:

- a = Number of species in Area A
- b = Number of species in Area B
- c = Number of species common to both

- Use Value (UV): UV = ∑U/N (Phillips & Gentry, 1993)
- Fidelity Level (FL%): FL = (Ip/Iu) × 100 (Friedman et al., 1986)
- Informant Consensus Factor (ICF): ICF = (Nur − Nt) / (Nur − 1) (Trotter & Logan, 1986).

3. RESULTS

3.1 Species Diversity and Use Categories

A total of 32 species of Malvaceae were documented (Table 1), out of which 23 species of herbs, 7 species of shrubs and 2 tree species were recorded. Plants are mainly used to treat gastrointestinal, respiratory, dermatological, and febrile conditions. Among these, *Sida cordifolia* showed the highest Use Value (0.85),

followed by *Abelmoschus moschatus* (0.72) and *Gossypium barbadense* (0.68). These values indicate their frequent use in treating ailments like fever, wounds, and menstrual disorders (Yadav et al., 2011; Meena et al., 2012). Similar findings were reported in other regions, suggesting their widespread ethnomedicinal importance (Chaturvedi & Tiwari, 2011; Jain & Rao, 2012).

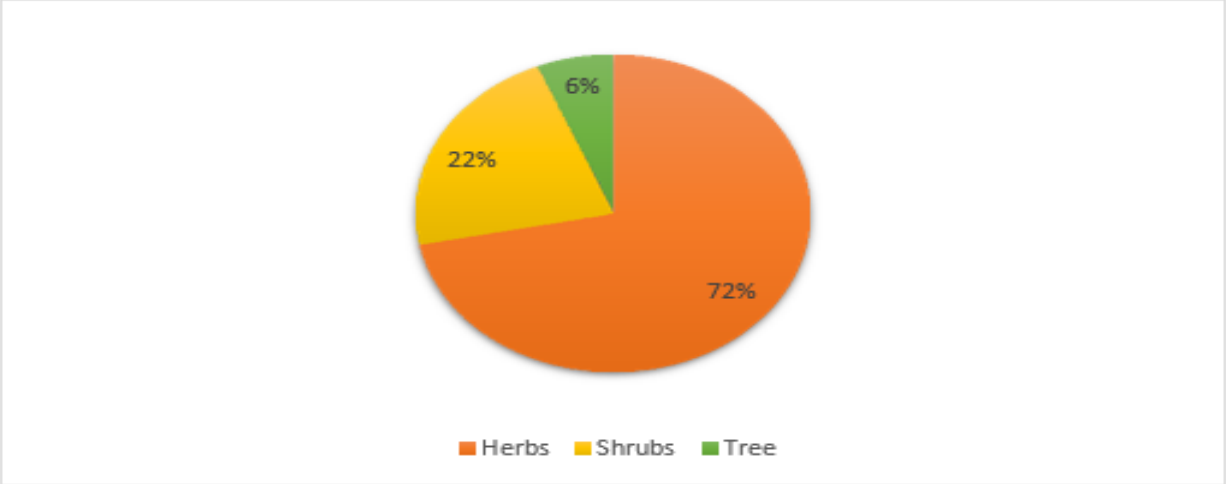

Fig2.: - Habit of the Plants

Table 1: - Documented Plant List

S.No.	*Botanical Name*	Local Name	Habit	Part Used	Ethnomedicinal Uses
1	*Abelmoschus crinitus* Wall.	Native Okra	Herbs	leaves, root	Minor wild edible, traditional uses
2	*Abelmoschus esculentus* (L.) Moench	Okra / Bhindi	Herbs	Pod seed,leaves,mucilage,entire plants	Vegetable, digestive aid
3	*Abelmoschus ficulneus* (L.) Wight & Arn.	Ran Bhindi	Herbs	leaves,seeds, root, fruits	oot and fruit used in folk medicine
4	*Abelmoschus manihot (L.)* Medik.	Junglee Bhindi	Herbs	leaves, root, fruits	Ornamental; leaves used in traditional medicine
5	*Abelmoschus moschatus* Medik.	Musk Dana/Kasturi Bhindi	Herbs	es, Root, bark, flowers	Seeds for perfume; medicinal uses
6	*Abutilon hirtum* (Lamk.) Sweet	Barkanghii	Herbs	Pod seed,leaves,mucilage,entire plants	Local ethnomedicinal use
7	*Abutilon indicum* (L.) Sweet	Kanghi/ Mudra/Atibala	Herbs	es, Root, bark, flowers	Ayurveda; anti-inflammatory, nerve tonic
8	*Abutilon pannosum* (G.Forst.) Schlecht.	Kasili	Herbs	ts, barks , seeds, leaves, flower	und healing, demulcent
9	*Gossypium arboreum* L.	Tree Cotton	Shrubs	leaves,seeds, root, fruits	Fiber; traditional medicine
10	*Gossypium barbadense* L.	Kapas	Shrubs	Seed, Leaves, Root, bark, flowers	Fiber, oil, skin issues

11	*Gossypium hirsutum* L.	Kapas	Shrubs	leaves, root, fruits	Cultivated, seed oil
12	*Hibiscus cannabinus* L.	Kudrang/Patsan	Shrubs	Seed, Leaves, Root, bark, flowers	Fiber; roots used medicinally
13	*Hibiscus lobatus* (J.A. Murr.) Kuntze	Jungli Kapas	Herbs	Pod seed,leaves,mucilage,entire plants	sed in folk medicine
14	*Hibiscus ovalifolius* (Forsk.) Vahl.	Chattan Kapas	Herbs	es, Root, bark, flowers	raditional medicine
15	*Hibiscus panduriformis* Burm. f.,	federate Rose	Herbs	ts, barks , seeds, leaves, flower	rnamental, mild medicinal use
16	*Hibiscus rosa- sinensis* L.	China Rose/ Gudhal/ Jasut	Shrubs	leaves, root	Hair care, skin, tea
17	*Hibiscus sabdariffa* L.	Patwa/ Ambari	Herbs	ts, barks , seeds, leaves, flower	Beverage, medicine, edible leaves
18	*Hibiscus trionum* L.	Bladder Kapas	Herbs	leaves,seeds, root, fruits	Used for skin problems and fever
19	*Hibiscus vitifolius* L.	Ban Kapas	Herbs	Pod seed,leaves,mucilage,entire plants	Ornamental; minor medicinal uses
21	*Kydia calycina* Roxb.	Barang	Tree	Fruits, Flowers seeds, leaves, bark, roots	
22	*Malva sylvestris* L.	Common Mallow	Herbs	Seed, Leaves, Root, bark, flowers	Soothing agent for respiratory issues
23	*Malvastrum coromandelianum* (L.) Garcke	False Mallow	Herbs	leaves, root	Wound healing, skin conditions
24	*Pavonia rapandra* (Roxb Ex J.E. Smith) Spreng..	Sikuar	Shrubs	leaves, root, fruits	Wound healing, skin conditions
25	*Sida acuta Burm.*f.	Badi Bala/Maha Bala	Herbs	leaves, root, fruits	Wound healing, ulcers, fever
26	*Sida cordifolia* L.	Bala	Herbs	es, Root, bark, flowers	Tonic, rheumatism, anti-inflammatory
27	*Sida mysorensis* W & A.	Bala	Herbs	Seed, Leaves, Root, bark, flowers	Folk medicine use
28	*Sida rhombifolia* L.	Ati Bala	Herbs	leaves,seeds, root, fruits	Anti-inflammatory, cough, fever
29	*Sida spinosa* L.	Kante Bala	Herbs	leaves, root	Traditional medicine, diuretic
30	*Sida veronicaefolia* Lam.	Bala	Herbs	Pod seed,leaves,mucilage,entire plants	ed in Ayurveda; nervine tonic
31	*Thespesia populnea* (L.) Soland. ex Corrêa	ortia Pedh / Paras Pipar	Tree	ts, barks , seeds, leaves, flower	Wound healing, liver disorders, wood and shade
32	*Urena lobata* L.	Bachita/Kungya	Shrubs	Roots, barks , seeds, leaves, flower	Fever, diarrhea, respiratory issues

3.2 Fidelity Level

The highest Fidelity Level (FL) was recorded for *Sida cordifolia* in treating fever (FL=89%), *Hibiscus rosa-sinensis* for skin diseases (FL=85%), and *Abutilon indicum* for respiratory ailments (FL=80%). High FL values indicate a consensus among informants about specific uses (Friedman et al., 1986; Maheshwari et al., 2015).

3.3 **I**nformant Consensus Factor

The ICF was highest for gastrointestinal disorders (0.79), followed by Reproductive issues (ICF = 0.75), skin infections (0.73), and respiratory diseases (0.68). High ICF indicates a well-established consensus among informants about the efficacy of these plants (Silva et al., 2011). This indicates strong agreement among informants on medicinal plants used for these ailments, reflecting their therapeutic relevance (Heinrich et al., 1998; Singh et al., 2018).

3.4 Ethnopharmacological Significance

Several species like *Abelmoschus moschatus* and *Hibiscus rosa-sinensis* have been pharmacologically validated for anti-inflammatory and antimicrobial properties, corroborating traditional claims (Kumar et al., 2010; Gupta & Gupta, 2012). This study adds to the growing body of knowledge advocating sustainable use and further pharmacological screening of these plants (Kala, 2005; Patil & Gaikwad, 2011).

3.5 Conservation Issues

The study observed threats to some species due to habitat degradation and overharvesting (Reddy et al., 2008; Pundir et al., 2017). Awareness programs and community-led conservation initiatives are essential to preserve this valuable indigenous knowledge and biodiversity (Bharucha & Pretty, 2010; Singh & Singh, 2017).

Fig 3: - Some documented plant photographs from the study area.

4. DISCUSSION

The high UV and FL% of *Sida cordifolia* corroborates its status in Ayurvedic pharmacopoeia (Sharma et al., 2010). The documented uses of *Gossypium* spp. in treating wounds and inflammation align with earlier findings from Bundelkhand and southern India (Ravishankar & Shukla, 2000; Ayyanar & Ignacimuthu, 2005). The presence of high ICF for gastrointestinal issues reflects the community's shared dependency on specific species like *Abelmoschus esculentus* for diarrhea and stomachache (Chhetri et al., 2005).

Additionally, lesser-known species like *Urena lobata* showed promising applications for urinary infections, suggesting the need for pharmacological evaluation (Upadhyay et al., 2007).

5. CONCLUSION

This study documents the rich ethnomedicinal knowledge of Malvaceae plants in Chhatarpur and quantitatively validates their traditional use. The high UV, FL%, and ICF values reflect their therapeutic importance and wide acceptance in the community. Conservation strategies and phytochemical validation of these species are urgently needed to preserve and potentially integrate this indigenous knowledge into modern healthcare systems.

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