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Ethnobotanical Diversity Traditional Knowledge and Conservation of Medicinal Plants used for the Treatment of Different Fever Conditions in Shravasti District Uttar Pradesh India

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***Abstract*-- Febrile illnesses, including malaria, dengue, and other fever-associated conditions, represent important health concerns in rural communities, where medicinal plants continue to contribute to traditional healthcare practices. The present study aimed to document medicinal plant diversity, traditional therapeutic knowledge, and conservation concerns associated with the ethnobotanical management of diverse febrile conditions in Shravasti District, Uttar Pradesh, India. Systematic ethnobotanical surveys and interactions with local traditional knowledge holders were conducted to record medicinal plant species, their traditional applications, plant parts utilized, preparation methods, and modes of administration. A total of 27 medicinal plant species representing 26 genera and 21 families were documented as traditionally used for different fever-related conditions, including malaria, dengue, and other febrile illnesses. Fabaceae was the most species-rich family, represented by five species. Leaves, roots, bark, stems, flowers, fruits, and whole plants were utilized in various traditional preparations, including decoctions, infusions, juices, pastes, and powders. The documented diversity highlights the persistence and significance of traditional ethnomedicinal knowledge associated with fever management in the study area. However, habitat degradation, unsustainable harvesting, anthropogenic pressures, and the gradual erosion of traditional knowledge may threaten these valuable medicinal resources. The study emphasizes the importance of systematic documentation, sustainable utilization, community participation, cultivation, and in situ and ex situ conservation of medicinal plants. The findings also provide a baseline for future phytochemical, pharmacological, and ethnopharmacological investigations of plants traditionally associated with malaria, dengue, and other febrile conditions.**

***Keywords*-- Ethnobotany; Ethnomedicine; Medicinal plants; Febrile conditions; Malaria; Dengue and Fever; Traditional knowledge.**

I. INTRODUCTION

Ethnobotany is an interdisciplinary field that examines the relationships between human communities and plant resources, with particular emphasis on traditional knowledge concerning the identification, utilization, management, and conservation of plants.

Medicinal plants constitute an important component of traditional healthcare systems, particularly among rural and forest-dependent communities. Such knowledge is generally transmitted through successive generations and encompasses information on plant selection, useful parts, preparation techniques, dosage practices, and therapeutic applications. Systematic documentation of this knowledge is important for understanding local healthcare practices and for identifying plant resources of potential pharmacological and conservation significance (Kumar and Bharati, 2014; Singh *et al*., 2012).

Shravasti is a northeastern district of Uttar Pradesh, India, located in the Tarai landscape near the Indo-Nepal border. The district headquarters is situated at Bhinga, and the district covers approximately 1,948.20 km² and contains 536 villages distributed among five development blocks (Government of Uttar Pradesh, 2026). The geographical position of Shravasti, together with its association with the Rapti River, forested landscapes, agricultural areas, wetlands, and grasslands, provides heterogeneous habitats capable of supporting diverse plant resources. Such environmental heterogeneity contributes to the availability of plant species that are used for food, household requirements, cultural practices, and traditional healthcare.

The Tarai region is characterized by considerable biological and cultural diversity, and forest-dependent communities have historically maintained close relationships with surrounding vegetation. The Tharu community is one of the indigenous populations associated with the Tarai region extending across northern India and southern Nepal. Traditional livelihoods of the Tharu include agriculture, animal husbandry, and the utilization of forest-derived resources. Medicinal plants form an important component of their traditional healthcare practices, and ethnobotanical knowledge is maintained through direct experience and intergenerational transmission (Kumar and Bharati, 2014).

Ethnobotanical research conducted specifically in Shravasti has demonstrated the importance of plant resources in the traditional life of the Tharu community.

Singh *et al*. (2022) documented 45 ethnobotanically important plant species used by Tharu communities of Shravasti, of which 30 species were reported for medicinal purposes. The study recorded the use of different plant parts, including roots, bark, leaves, stems, seeds, flowers, and latex, indicating a broad knowledge base concerning the therapeutic utilization of locally available vegetation (Singh *et al*., 2022). The authors also noted that remote forest-fringe communities continue to depend on traditional plant-based healthcare because access to modern healthcare services may be comparatively limited in some locations (Singh *et al*., 2022).

Studies from neighbouring Tarai regions further demonstrate the importance of medicinal plants in traditional healthcare among Tharu communities. Kumar and Bharati (2014) documented 95 medicinal plant species and 97 ethnomedicinal preparations used for treating 49 human ailments among Tharu communities of Dudhwa National Park. Their study reported considerable agreement among informants concerning the traditional management of several ailment categories, including fever. Andrographis paniculata was specifically documented for traditional use against fever and anorexia (Kumar and Bharati, 2014). Similarly, Kumar (2012) documented 32 plant species associated with 30 traditional phytotherapeutic practices for the management of different types of fever among the Tharu community of the Tarai region of Uttar Pradesh.

The study included traditional applications associated with malaria and other fever conditions and emphasized the need for further safety, efficacy, and conservation studies (Kumar, 2012).

The persistence of fever-related ethnomedicinal knowledge in the Tarai region highlights the importance of documenting locally specific plant-use practices. However, ethnobotanical records describe traditional practices and should not be interpreted as evidence of clinically established efficacy against malaria, dengue, or other infectious diseases. Scientific investigation of such traditional claims requires subsequent pharmacological, phytochemical, toxicological, and clinical evaluation.

Therefore, the present study was undertaken to document the medicinal plant diversity and traditional therapeutic knowledge associated with the management of different febrile conditions in Shravasti district, Uttar Pradesh, India. Particular attention was given to plant identity, taxonomic diversity, traditional indications, plant parts utilized, preparation methods, modes of administration, and conservation concerns. The study aims to provide baseline ethnobotanical information that may support the preservation of traditional knowledge, sustainable utilization of medicinal plant resources, and future ethnopharmacological and conservation research in the Shravasti region.

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Map-1: Geographical location of Shravasti District in Uttar Pradesh, India.

II. Review Of Literature

Ethnobotany is an interdisciplinary field concerned with the relationships between human communities and plants, particularly the traditional knowledge associated with their identification, utilization, management, and conservation.

Indigenous plant knowledge represents an important component of cultural heritage and provides valuable information on medicinal, nutritional, and other uses of locally available plant resources. In India, systematic ethnobotanical investigations have contributed substantially to the documentation of traditional healthcare practices and plant-based knowledge.

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Important contributions include those of Chopra *et al.* (1956), Jain (1991), Kirtikar and Basu (1999), and Dubey *et al.* (2004), which established a foundation for subsequent ethnobotanical research.

Uttar Pradesh possesses considerable ethnobotanical diversity owing to its varied vegetation, agricultural landscapes, forest ecosystems, and culturally diverse communities. Numerous studies have documented the traditional utilization of medicinal plants in different parts of the state. Investigations by Dixit and Pandey (1984), Singh and Maheshwari (1989), Narain and Narain (1999), Pandey and Verma (2002), Singh *et al.* (2002, 2003, 2007, 2010), Mishra *et al.* (2012), Dubey (2012), Narayan and Singh (2017), and Srivastava and Shukla (2018) have contributed to the understanding of traditional plant use in different ecological and cultural settings.

The Tarai region of northern Uttar Pradesh is particularly important for ethnobotanical research because of its rich plant diversity and the presence of indigenous communities, especially the Tharu. Studies among the Tharu community have documented extensive medicinal knowledge and the use of locally available plants for treating various human ailments. Kumar and Bharati (2014) recorded 95 medicinal plant species and 97 ethnomedicinal preparations used by Tharu communities of Dudhwa National Park. Similarly, Kumar *et al.* (2013) documented 92 medicinal plant species used for dermatological healthcare by the Tharu community of the Uttar Pradesh Tarai. Ethnobotanical research in Panchapedwa, Balrampur, also demonstrated the continued importance of medicinal and food plants in Tharu traditional practices (Mishra & Shrivastava, 2018). In Shravasti district, Singh *et al.* (2022) reported diverse medicinal and other utilitarian uses of plants among the Tharu community. In Uttar Pradesh, ethnobotanical research has been extensively carried out in different districts and ecological regions by various workers, including Prajapati, *et al*. (2025a, 2025b, 2026a, 2026b), Rahul, *et al.* (2026) and Patel, *et al*. (2026).

Despite these contributions, localized ethnobotanical investigations in several parts of the Uttar Pradesh Tarai remain necessary. Traditional knowledge is predominantly transmitted through oral and intergenerational processes and may be affected by socioeconomic and environmental changes. Therefore, systematic documentation of medicinal plants and associated indigenous knowledge is essential for cultural preservation and may provide a foundation for future phytochemical, pharmacological, and conservation studies.

III. Materials And Methods

Systematic ethnobotanical surveys were conducted from 2024 to 2026 at selected localities of Shravasti district, Uttar Pradesh, including Motipur, Bhachkahi, Masaha Kalan, and Katkuinya villages. Fieldwork was undertaken at regular intervals throughout different seasons to assess the occurrence, availability, and traditional medicinal utilization of locally occurring plant resources. Plant specimens were collected from representative habitats and localities with the assistance of local residents and knowledgeable members of the indigenous communities. Ethnomedicinal information, including the traditional uses and therapeutic applications of the collected plants, was documented through field observations and interactions with local knowledge holders. For each specimen, comprehensive field records were maintained, including collection number, botanical identity, family, habitat or vegetation type, locality, date of collection, and photographic documentation. These records were subsequently used for specimen identification, voucher preparation, and correlation of botanical information with the documented ethnomedicinal uses.

Herbarium specimens were prepared following standard herbarium techniques. Individual specimens were pressed, dried, and processed appropriately before mounting on herbarium sheets. Detailed labels were prepared for each specimen, containing essential information such as botanical name, family, habitat, locality, and plant colour, date of collection, collector's name, collection number, and other relevant field observations. Standard herbarium procedures were followed to ensure the preservation and future verification of collected material (Jain & Rao, 1977).

Taxonomic identification of the collected specimens was undertaken using relevant floristic literature, taxonomic keys, and authoritative regional floras. Major references consulted for identification included *The Flora of British India* by Hooker (1872–1897) and *Flora of the Upper Gangetic Plain and of the Adjacent Siwalik and Sub-Himalayan Tracts* by Duthie (1960). The identity of specimens was confirmed by comparing diagnostic morphological characters with descriptions provided in standard taxonomic literature and available herbarium material.

Following identification and processing, the collected specimens were treated appropriately for long-term preservation and mounted on standard herbarium sheets. The voucher specimens were subsequently deposited in the Herbarium of the Department of Botany, Prof. B. K. Verma Herbarium, Maharaja Bijli Pasi Government P.G. College, Lucknow, Uttar Pradesh.

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The preserved specimens serve as permanent voucher material for verification, taxonomic reference, and future ethnobotanical research.

IV. Data Collection

The documentation of ethnomedicinal plants traditionally used for the management of febrile conditions was conducted through systematic field investigations across selected localities of Shravasti district, Uttar Pradesh, from December 2024 to June 2026. A structured fieldwork protocol was followed to obtain primary ethnobotanical information and to document the traditional therapeutic knowledge associated with locally available medicinal plants.

Ethnomedicinal information was obtained from traditional healers, local Vaidyas, and other knowledgeable community members, with particular attention to elderly informants possessing substantial experience in traditional plant-based healthcare practices. Data were gathered through a pre-tested structured questionnaire (provided as supplementary material), semi-structured interviews, direct field observations, and field-based discussions. Information pertaining to plant identification, parts utilized, preparation techniques, route and frequency of administration, dosage, and storage or shelf life of herbal preparations was systematically recorded.

The information obtained from individual informants was subsequently compared and cross-checked through repeated discussions with traditional healers, experienced community members, and local Vaidyas. This participatory and cross-validation approach was employed to improve the consistency, reliability, and accuracy of the recorded ethnomedicinal information. The documented data were subsequently correlated with the collected plant specimens and corresponding voucher records to establish a reliable association between botanical identity and traditional therapeutic use.

V. Result

A total of 70 informants were interviewed during the ethnobotanical investigation conducted across selected localities of Shravasti district, Uttar Pradesh (Table 1).

The informant population comprised 55 males (78.57%) and 15 females (21.43%). The higher proportion of male participants may be related to their greater involvement in field-based activities, medicinal plant collection, agricultural practices, and interactions with investigators. The comparatively lower representation of female informants may reflect differences in accessibility and participation during field-based interviews and community interactions.

The informants represented diverse categories of traditional knowledge holders, including herbal practitioners, medicinal plant collectors, farmers, and herders. They possessed considerable knowledge regarding the identification, collection, preparation, and traditional therapeutic use of locally available medicinal plants. The participants represented different age groups and educational backgrounds, reflecting variation in their experience and exposure to traditional healthcare practices.

The informants were categorized into three age groups (Table 1). The 60–70-year age group constituted the largest proportion of participants, accounting for 50% of the total respondents, whereas individuals above 70 years represented the smallest proportion, comprising 14.28%. The relatively greater representation of older informants indicates that experienced members of the community remain important repositories of traditional ethnomedicinal knowledge.

With respect to educational status, 82.85% of the informants were illiterate, whereas 17.14% had received primary-level education. The comparatively greater contribution of ethnomedicinal information from informants with no formal education may reflect their prolonged engagement with traditional healthcare practices and direct dependence on locally available plant resources. However, this observation should not be interpreted as a direct causal relationship between educational status and knowledge level. Changes in healthcare preferences, modernization, changing lifestyles, and reduced dependence on traditional plant-based remedies may influence the intergenerational transmission of ethnomedicinal knowledge.

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Table 1. Demographic characteristics of informants interviewed during the ethnobotanical survey in Shravasti district, Uttar Pradesh.

Demographic feature	Categories	No. of person	Percentage (%)
Informants	Local inhabitant's (Male)	55	78.57
	Local inhabitant's (Female)	15	21.42
Age	50-59	25	35.71
	60-70	35	50
	More than 70	10	14.28
Education	Illiterate	58	82.85
	Primary	12	17.14
Total		**70**	

The ethnobotanical survey documented 27 medicinal plant species belonging to 26 genera and 21 families. Among the recorded families, Fabaceae was the most represented, comprising five species, followed by Solanaceae with three species. Asparagaceae, Amaranthaceae, Meliaceae, Asclepiadaceae, Caricaceae, Apiaceae, Cleomaceae, Asteraceae, Malvaceae, Acanthaceae, Verbenaceae, Anacardiaceae, Sapotaceae, Moringaceae, Oleaceae, Lamiaceae, Euphorbiaceae, Apocynaceae, and Menispermaceae were represented by one species each.

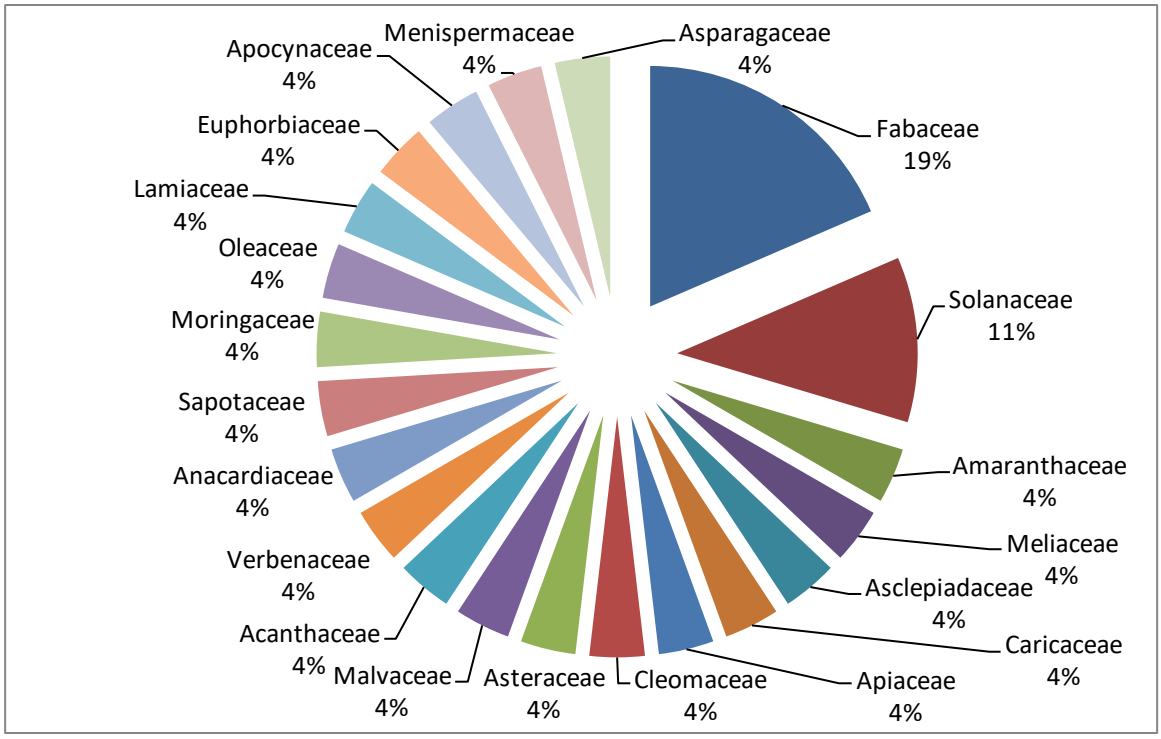


Figure: 1. Distribution of medicinal plant species among the different plant families recorded in the study area.

Different plant parts were utilized for the treatment of febrile conditions. Roots were the most frequently used plant part, being reported for 10 species, followed by leaves (9 species).

The whole plant was utilized in three species, whereas bark and fruits were each reported for two species. Flowers and inflorescences were used in one species each.

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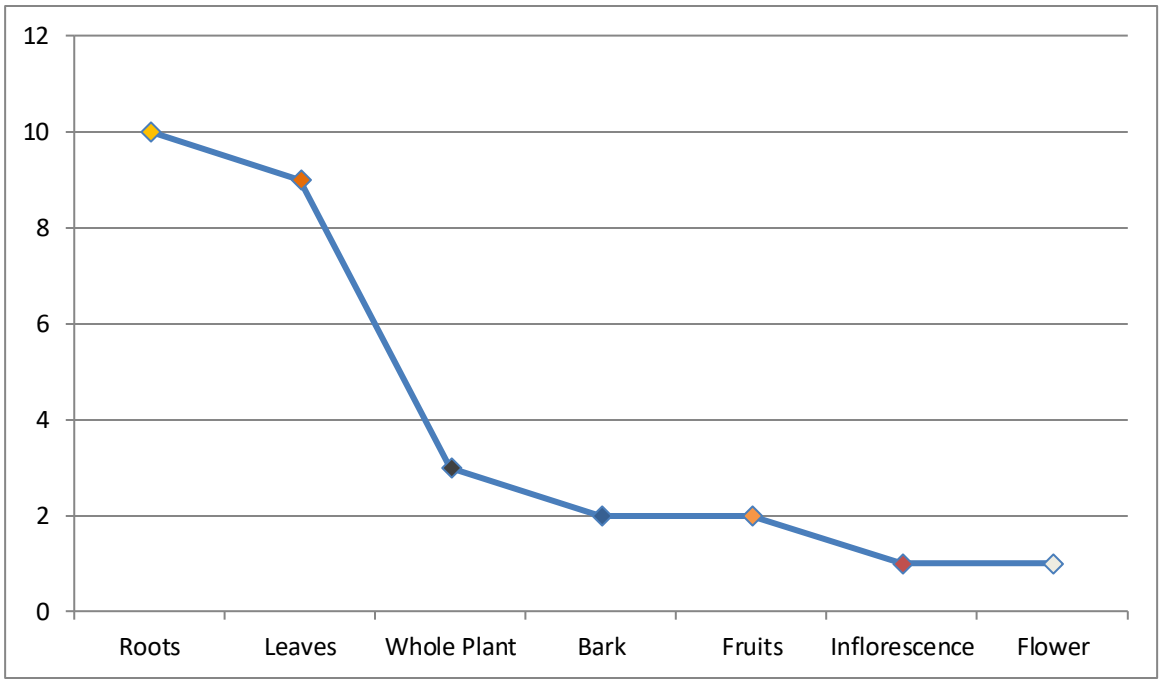


Figure: 2. Distribution of medicinal plant species based on the plant parts used for the treatment of febrile conditions.

Regarding the targeted febrile conditions, 20 species were reported to be used traditionally for the treatment of fever, six species were specifically associated with malaria, and one species was reported for the treatment of dengue.

These findings demonstrate the diversity of medicinal plant resources and the continued reliance on plant-based traditional knowledge for managing different febrile conditions in the study area.

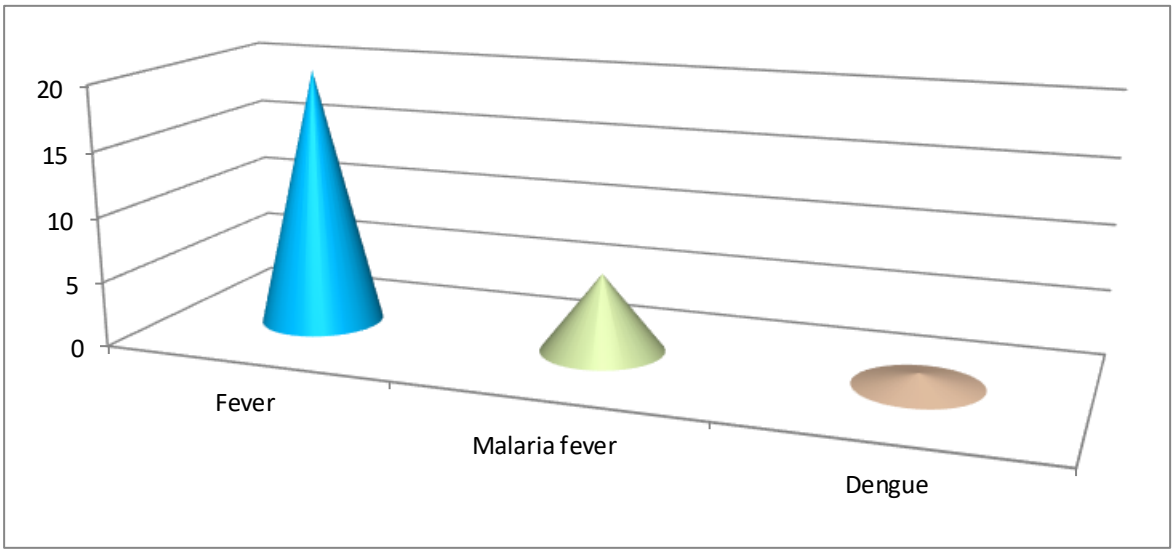


Figure: 3. Number of medicinal plant species traditionally used for the treatment of fever, malaria, and dengue.

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VI. Discussion

The present ethnobotanical investigation documented 27 medicinal plant species belonging to 26 genera and 21 families traditionally used for the management of different febrile conditions in Shravasti District, Uttar Pradesh, India. The recorded taxonomic diversity indicates the importance of local plant resources in traditional healthcare practices. The representation of numerous families within a relatively focused group of therapeutic applications also reflects the diversity of indigenous knowledge associated with fever management. Similar ethnobotanical investigations in the Tarai region of Uttar Pradesh and adjoining areas have documented substantial use of medicinal plants for fever and other common ailments, highlighting the importance of this region as a repository of traditional phytotherapeutic knowledge.

Fabaceae was the most represented family, with five species, followed by Solanaceae with three species, while the remaining families were represented by one species each. The predominance of Fabaceae may be associated with its considerable species diversity, wide distribution, and availability in the study area. However, family-level dominance should be interpreted primarily as a reflection of local plant availability and traditional utilization rather than as evidence of greater therapeutic effectiveness. Similar dominance of Fabaceae has been reported in several ethnobotanical studies conducted in different parts of India.

The analysis of plant parts revealed that roots were the most frequently utilized part (10 species), followed by leaves (9 species). Whole plants were used in three species, while bark and fruits were each used in two species; flowers and inflorescences were each represented by one species. The frequent utilization of roots suggests their considerable importance in local therapeutic practices. However, root harvesting is generally more destructive than harvesting leaves or other renewable parts because removal of roots may impair plant survival and regeneration. Therefore, the present findings emphasize the need for sustainable harvesting practices and cultivation of frequently utilized medicinal species. The comparatively high use of leaves may provide a more sustainable alternative when harvesting is conducted without substantially affecting plant growth and regeneration.

With respect to disease-specific applications, 20 species were reported for general fever, six species for malaria, and one species for dengue. The greater number of species used for general fever may reflect the common occurrence and broad traditional recognition of fever as a health condition. The documentation of six species for malaria further demonstrates the specialized nature of local ethnomedicinal knowledge.

Traditional antimalarial plants have been widely documented in different regions of India, and several such species have subsequently attracted phytochemical and pharmacological research. Nevertheless, the reported traditional uses should be regarded as ethnobotanical observations and should not be interpreted as evidence of clinically established efficacy.

The documentation of only one species for dengue may reflect the comparatively specific nature of local knowledge concerning this disease. Further pharmacological and phytochemical investigations are necessary to determine whether traditionally used species possess biologically relevant antipyretic or disease-specific activities.

The findings also highlight the close relationship between traditional knowledge and medicinal plant conservation. Knowledge concerning plant identification, medicinal applications, and harvesting practices is often transmitted through generations and may be vulnerable to gradual erosion. Sustainable collection, cultivation of medicinal plants, community-based conservation, documentation of traditional knowledge, and awareness among younger generations may therefore contribute to both biodiversity conservation and preservation of cultural knowledge. Overall, the present study provides a baseline for further ethnobotanical, phytochemical, pharmacological, and conservation research on medicinal plants traditionally used for febrile conditions in Shravasti District.

VII. Conservation Strategies

The present study highlights the need for effective conservation and sustainable utilization of medicinal plants traditionally used for the treatment of different febrile conditions in Shravasti District. The frequent use of roots, bark, and whole plants requires particular attention because destructive harvesting may reduce natural regeneration and threaten local plant populations. Sustainable collection practices should therefore be promoted, with preference given to renewable plant parts such as leaves, flowers, and fruits wherever therapeutically appropriate.

In situ conservation should focus on protecting medicinal plants within their natural habitats through habitat protection, population monitoring, controlled harvesting, and community participation. **Ex situ conservation** should be strengthened through botanical gardens, herbal gardens, nurseries, seed banks, and institutional plant collections. Frequently utilized medicinal species should also be encouraged for cultivation and propagation to reduce pressure on wild populations.

Documentation and preservation of traditional ethnobotanical knowledge are equally important. Knowledge possessed by traditional healers, elderly people, and local communities should be systematically recorded and transmitted to younger generations. Community awareness programmes should promote sustainable harvesting, species identification, cultivation, and habitat protection. Integrating traditional knowledge, community participation, sustainable harvesting, cultivation, and in situ and ex situ conservation can contribute substantially to the long-term conservation of medicinal plant diversity in Shravasti District.

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Table-2: Quantitative documentation of medicinal plants species of Sharavsti district of of Uttar Pradesh.

S. No.	Genera/Species	Family	Local Name	Habit	Ethnomedicinal Uses	Part used	Field No.
1.	*Asparagus racemosus* Willd.	Asparageceae	Satavar	Climber	Fever	Root	3074
2.	*Achyranthus aspera* L.	Amaranthaceae	Chirchita	Herb	Fever	Root	3079
3.	*Azardirachta indica* Juss.	Meliaceae	Neem	Tree	Malaria fever	Leaves and Inflorescence	3020
4.	*Bauhinia variegata* L.	Fabaceae	Kachnar	Tree	Malaria fever	Bark	3021
5.	*Calotropis procera* Br.	Asclepiadaceae	Madar	Shrub	Fever	Root	3005
6.	*Carica papaya* L.	Caricaceae	Papista	Shrub	Dengue	Leaves	3043
7.	*Cassia fistula* L.	Fabaceae	Amaltas	Tree	Fever	Root	3054
8.	*Centella asiatica* (L.) Urb.	Apiaceae	Bramhi	Herb	Fever	Leaves	3080
9.	*Cleome viscosa* L.	Cleomaceae	Jangali Hurhur	Herb	Fever	Whole plant	3081
10.	*Datura metel* L.	Solanaceae	Dhatura	Herb	Fever	Fruit	3053
11.	*Eclipta prostata* (L.) L.	Asteraceae	Bhringraj	Herb	Fever	Whole plant	3004
12.	*Hibiscus rosa-sinensis* L.	Malvaceae	Betjongnaro	Shrub	Fever	Flower	3025
13.	*Justicia adhatoda* L.	Acanthaceae	Adusa	Shrub	Malaria fever	Root	3073
14.	*Lantana camara* L.	Verbenaceae	Galphusia	Shrub	Malaria fever	Root	3032, 3033
15.	*Mangifera indica* L.	Anacardiaceae	Aam, Amba	Tree	Fever	Leaves	3048
16.	*Mimusops elengi* L.	Sapotaceae	Bahauli	Tree	Fever	Leaves	3072
17.	*Moringa oleifera* Lam.	Moringaceae	Saijana	Tree	Fever	Bark	3030
18.	*Nyctanthes arbor-tristis* L.	Oleaceae	Gargad, Harsingar	Tree	Malaria fever	Leaves	3026
19.	*Ocimum basilicum* L.	Lamiaceae	Tukmalanga	Shrub	Fever	Leaves	3075
20.	*Ricinus communis* L.	Euphorbiaceae	Red	Shrub	Fever	Roots	3078
21.	*Senna tora* L.	Fabaceae	Chakonda	Herb	Fever	Root	3034
22.	*Solanum melongena* var. *incanum* (L.) Ktze.	Solanaceae	Banbhantawa, Bhata	Herb	Fever	Fruits	3060
23.	*Solanum nigrum*	Solanaceae	Makoi	Herb	Fever	Root	3082
24.	*Tabernaemontana divaricate* (L.) Br. ex Roem. & Schult.	Apocynaceae	Chandni	Shrub	Fever	Leaves	3027
25.	*Tamarindus indica* L.	Fabaceae	Amli, Imli	Tree	Fever	Leaves	3028
26.	*Tinospora codifolia* (L.) Merr.	Menispermiaceae	Baur, Athervel, Giloe	Climber	Fever	Whole plant	3029
27.	*Uraria picta* (Jacq.) Desv.	Fabaceae	Kavario	Herb	Fever	Roots	3061

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