

Ethnomedicinal Plants Used by Local Communities of Meerut District, Uttar Pradesh, India

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Abstract: *The present study documents ethnomedicinal plants used by local communities in the Meerut region of Uttar Pradesh, India. Data were obtained through field surveys and semi-structured interviews with traditional healers and local residents. In total, 32 medicinal plant species belonging to 21 families were recorded. These species are traditionally employed in the treatment of fever, diabetes, skin diseases, respiratory disorders, digestive ailments, and joint pain. Herbs constituted the predominant life form, and leaves were the most frequently used plant part. The findings underscore the continued importance of traditional plant-based healthcare practices and highlight the need to conserve both medicinal plant resources and associated indigenous knowledge for future generations.*

Keywords: Ethnomedicine, Ethnobotany, Medicinal Plants, Traditional Knowledge, Indigenous Healthcare, Meerut.

I. INTRODUCTION

Ethnomedicinal studies form a core component of ethnobotany, documenting how local communities use plants to meet primary healthcare needs. In developing countries such as India, a substantial proportion of the population still relies on plant-based remedies for common ailments, including fever, cough, colds, skin disorders, and digestive problems (Yadav & Agarwala, 2011).

Meerut, situated in the fertile plains of western Uttar Pradesh, is notable for its rich floristic diversity and longstanding tradition of herbal medicine, much of which is transmitted orally across generations (Kumar et al., 2013).

India's exceptional plant biodiversity has earned it the epithet "Botanical Garden of the World" (Dubey et al., 2004) and underpins major traditional medical systems such as Ayurveda, Unani, Siddha, and diverse local practices, whose roots can be traced to ancient texts like the Rigveda, Yajurveda, Atharvaveda, Charak Samhita, and Sushruta Samhita (Sinha, 2002). Of the roughly 422,000 flowering plant species recorded globally (Govaerts, 2001), over 50,000 are medicinal (Schippmann et al., 2002), and in India, more than 43% of flowering plants are considered to have therapeutic value (Pushpangadan, 1995). Indigenous and rural communities, often lacking affordable access to modern healthcare, depend heavily on this knowledge for primary health care, including the treatment of serious conditions such as snakebite (Siddiqui & Husain, 1990; Houghton & Osibogun, 1993).

The Indian Systems of Medicine employ around 400 plant species, largely harvested from wild tropical and temperate forests, with diverse plant parts (roots, bark, whole plants, flowers, fruits, leaves, seeds, wood, rhizomes, and stems) used in formulations (Kumar et al., 2011). Ethnomedicine is generally affordable, widely available, and perceived to have fewer side effects compared with many synthetic pharmaceuticals (Bakshi et al., 2025), contributing to its continued importance.

The World Health Organization estimates that about 80% of people in developing countries rely on traditional medicine for primary healthcare (WHO, 2002). Against this backdrop, the present study aims to systematically document and analyze the diversity, ethnomedicinal uses, and conservation status of medicinal plants in Meerut and surrounding areas, with a view to preserving traditional knowledge and supporting future pharmacological research (Mehra et al., 2025).



II. AIMS AND OBJECTIVES

The main aim of the present study is to investigate the ethnomedicinal plants of Meerut on their medicinal value, phytochemical composition, and the chemical basis of their therapeutic properties.

- To identify and document medicinal plants found in the Meerut region. And record local names, scientific names, and traditional uses.
- Evaluate how these plants can treat common health problems such as fever, skin disease, cough, etc.
- Examine the active parts in these plants, like alkaloids, flavonoids, tannins, etc., and look at how they bond with other elements.
- Explore how the chemical structure of these compounds relates to their effects on health.
- To explain the mechanisms of antimicrobial, anti-inflammatory, and antioxidant activity.
- To validate medicinal claims by reviewing relevant literature.
- To emphasize the significance of conserving medicinal plants.
- To analyze the threats to medicinal plants posed by urbanization.

III. REVIEW OF LITERATURE

Ethnomedicinal plants are a key component of primary healthcare for many indigenous and rural communities, especially where access to modern medicine is limited. In India, they support major traditional systems such as Ayurveda, Unani, Siddha, and folk practices, and are widely used to manage infectious, metabolic, dermatological, respiratory, gastrointestinal, and other disorders. Studies across Uttar Pradesh (Qayum et al., 2016; Ahamed et al., 2010; Dhiman & Dhiman, 2008; Tomar, 2007–2023) have documented extensive medicinal plant diversity and use, while noting growing pressure from habitat loss, overharvesting, and socio-cultural change.

Despite this, locality-specific data for Meerut district remain scarce and fragmented, with limited information on how communities currently select, prepare, and administer plant-based remedies. Rapid urbanization and increasing dependence on allopathic medicine are further eroding orally transmitted knowledge.

This study provides a structured, locality-specific account of medicinal plant use in Meerut district. It documents species diversity, traditional therapeutic applications, and conservation status, drawing on the knowledge of traditional healers, herbal practitioners, and elderly residents. The findings aim to inform future ethnopharmacological research and conservation efforts, promote sustainable use of medicinal plant resources, and help preserve the region's biocultural heritage.

IV. MATERIAL AND METHODS

The study was conducted in and around Meerut City, Uttar Pradesh (28.9845° N, 77.7064° E), located on the fertile alluvial plains of the Ganga and Hindon rivers. The area's deep, nutrient-rich soils and subtropical climate, with about 586 mm of annual rainfall mostly during the southwest monsoon, support intensive agriculture and high plant diversity. Floristic diversity in Meerut district has been reported in several earlier works (Dixit & Pandey, 1984; Jain & Puri, 1984; Narain & Mishra, 2008; Singh & Singh, 2009; Prakash, 2011; Singh & Dubey, 2012; Shukla et al., 2014; Om Prakash et al., 2017; Kiran et al., 2021), providing a baseline for the regional flora. Building on these studies, the present work specifically examines the diversity, traditional uses, and conservation status of medicinal plants used by local communities. By documenting species composition, ethnomedicinal applications, and perceived threats, it offers detailed, locality-specific information to support ethnomedicinal records, conservation planning, and sustainable use of plant resources.

Data Collection

Information on medicinal plant use was obtained through personal interviews and discussions with local residents, elderly community members, traditional healers (Vaidyas), and farmers. Data on vernacular names, plant parts used, methods of preparation, and therapeutic applications were recorded using a pre-designed, structured questionnaire.



Plant Collection and Identification

Medicinal plant species reported by informants were collected from their natural habitats. Voucher specimens were prepared and subsequently identified using standard floras and relevant botanical literature. Scientific names were verified and recorded along with their corresponding families and local names.

Documentation of Ethnomedicinal Uses

Ethnomedicinal information obtained during the survey was systematically documented. For each species, details such as botanical name, family, local name, plant part(s) used, method of preparation, mode of administration, and ailments treated were compiled and organized into tabular form for subsequent analysis.

Data Analysis

The collected data were organized and analyzed to identify the most frequently used medicinal plant species, the plant parts predominantly utilized, and the major categories of diseases treated with traditional herbal remedies in the study area. Descriptive statistics were employed to summarize usage patterns and highlight key species of ethnomedicinal importance. (Jain, S. K. 2007); (Martin, G. J.1995); (WHO, 2013).

V. RESULTS AND DISCUSSION

S. No.	Botanical Name	Family	Habit	Hindi Name	Useful Parts	Medicinal Uses
1	<i>Acacia farnesiana</i> (L.) Willd.	Fabaceae	Shrub	Keekar	Bark & Latex	Diarrhoea, wound, headache and stomach cancer
2	<i>Aloe vera</i> (L.) Burm. f.	Asphodelaceae	Herb	Ghritkumari	Leaves	Skin diseases, amenorrhoea, hepatopathy, and constipation
3	<i>Andrographis paniculata</i> (Burm.) Wall. ex Nees	Acanthaceae	Herb	Kalmegh	Whole plant	Sclerosis, depression, diarrhoea, dysentery, cholera, lupus and diabetes
4	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Shrub	Shatavari	Roots	Dysentery, rheumatism, nervous disorders, galactagogue and rejuvenation
5	<i>Azadirachta indica</i> (L.) A. Juss.	Meliaceae	Tree	Neem	Leaves, bark, flowers and roots	Tubercular glands, leprosy, skin diseases, leucoderma, eczema, pruritus and malarial fever
6	<i>Bambusa bambos</i> (L.) Voss	Poaceae	Herb	Bans	Young leaves and shoots	Lumbago, hemorrhoids, gonorrhoea, burning sensation and strangury
7	<i>Bauhinia variegata</i> L.	Fabaceae	Tree	Kanchnar	Bark, leaves and flowers	Wounds, skin diseases, scrofula, glandular swelling and sore throat
8	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb	Punarnava	Roots	Arthritis, cough,



		e				impotence, skin disorders, anaemia and hepatic disorders
9	<i>Cannabis sativa</i> L.	Cannabaceae	Herb	Bhaang	Whole plant	Malarial fever, diarrhoea, insomnia and tumour
10	<i>Carica papaya</i> L.	Caricaceae	Tree	Papita	Fruit, leaves and latex	Dentalgia, throat disorders, diarrhoea, hemorrhoids, paralysis and skin disorders
11	<i>Cassia fistula</i> L.	Fabaceae	Tree	Amaltas	Bark	Diabetes, piles, kidney disease, menstrual disorders and diarrhoea
12	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Herb	Sadabahar	Leaves, flowers and roots	Diabetes, leukemia and stomach ache
13	<i>Clitoria ternatea</i> L.	Fabaceae	Climber	Aparajita	Roots, leaves, flowers and seeds	Cough, smallpox, piles, cold and asthma
14	<i>Curcuma longa</i> L.	Zingiberaceae	Herb	Haldi	Rhizome	Arthritis, muscle sprains, swelling and pain
15	<i>Dalbergia sissoo</i> DC.	Fabaceae	Tree	Sheesham	Leaves and bark	Blood disorders, dysentery, dyspepsia, leucoderma and diabetes
16	<i>Datura metel</i> L.	Solanaceae	Shrub	Dhatura	Seeds	Insanity, asthma, cholera, gout and scorpion bite
17	<i>Ficus carica</i> L.	Moraceae	Tree	Anjeer	Fruit and bark	Warts, piles, corns, dental abscesses and anaemia
18	<i>Ficus religiosa</i> L.	Moraceae	Tree	Peepal	Fruit and bark	Wounds, diabetes, gonorrhoea and skin disorders
19	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Shrub	Gudhal	Roots, leaves and flowers	Osteoarthritis, boils, cough, sprain and wounds
20	<i>Jasminum officinale</i> L.	Climber	Oleaceae	Chameli	Leaves, flowers and roots	Otorrhoea, ringworm, menstrual disorders, skin diseases and dyspepsia
21	<i>Mangifera indica</i> L.	Anacardiaceae	Tree	Aam	Fruit, seeds and bark	Emesis, syphilis, wounds, diarrhoea and jaundice



22	Melia azedarach L.	Meliaceae	Tree	Bakain	Roots, bark and leaves	Leprosy, scrofula, gingivitis, pyrexia, bleeding piles and rheumatism
23	Nerium indicum Mill.	Apocynaceae	Shrub	Kaner	Roots and root bark	Stomatitis, arthritis, pruritus, cough and bronchitis
24	Ocimum tenuiflorum L. (Syn. O. sanctum L.)	Lamiaceae	Herb	Shyam Tulsi	Leaves, roots and bark	Arthritis, cancer, acidity, diabetes and toothache
25	Phyllanthus emblica L. (Syn. Emblica officinalis Gaertn.)	Phyllanthaceae	Tree	Amla	Fruit	Dyspepsia, rejuvenation, pain, inflammation, anaemia and jaundice
26	Santalum album L.	Santalaceae	Tree	Chandan	Heartwood	Gonorrhoea, skin diseases, kidney problems, mental disorders, dysuria and cystitis
27	Saraca indica L.	Fabaceae	Tree	Ashok	Bark and flowers	Menorrhagia, leucorrhoea, internal bleeding, haemorrhoids, eye diseases, fever and bone fracture
28	Tamarindus indica L.	Fabaceae	Tree	Imli	Fruit and leaves	Stomatitis, diarrhoea, haemorrhoids, dysentery, anorexia and diabetes
29	Tinospora cordifolia (Willd.) Miers	Menispermaceae	Climber	Giloy	Stem, leaves and roots	Fever, immunity booster, digestive disorders, detoxification and joint inflammation
30	Vitex negundo L.	Lamiaceae	Shrub	Nirgundi	Leaves, roots, bark and seeds	Joint pain, inflammation, bronchitis, asthma, wounds and fever
31	Withania somnifera (L.) Dunal	Solanaceae	Shrub	Ashwagandha	Leaves, roots and root bark	Arthritis, diabetes, general debility, sexual debility, spermatorrhoea, rheumatism, leucorrhoea and leucoderma
32	Zingiber officinale Roscoe	Zingiberaceae	Herb	Adrak	Rhizome	Cough, fever, rhinitis, bronchitis and headache



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