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## “Ethno-Medicinal Status of Plants in Meerut, Uttar Pradesh, India”

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### Abstract

Present study reports on the diversity, ethno-medicine knowledge, and conservation status of Medicinal plants in different areas of Meerut, Uttar Pradesh, India. Purposive sampling method was used for area selection. A total of 107 plant species, representing 44 families and 86 genera, were documented as used in the traditional healthcare system of Meerut district. The most common life forms were trees (54 species, 50.5%), herbs (27 species, 25.23%), shrubs (18 species, 16.8%), climbers (8 species, 7.48%), and grasses (1 species, 0.9%). Bark was the most frequently used plant part (45 species), followed by leaves (42), fruits (33), roots (32), flowers (17), seeds (13), latex (09), whole plant (08), stem (4), oil (03), rhizome (02), and heartwood (01). The study emphasizes the continued importance of traditional knowledge for primary healthcare and highlights the need for conservation and pharmacological validation of these species.

**Keywords-** Ethno-medicinal plants, Ayurveda, Meerut, Medicinal Plants, Folklore uses.

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### Introduction

Traditional medicine has been an integral part of human healthcare for centuries, with the World Health Organization (WHO) estimating that nearly 80% of the global population relies on plant-based remedies for primary healthcare (WHO, 2023).<sup>1</sup> India, with its rich biodiversity and cultural heritage, possesses extensive ethnomedicinal knowledge that remains relevant today. However, this knowledge is increasingly threatened by modernization, habitat loss, and inadequate documentation. Systematic ethnobotanical studies are therefore essential to record traditional practices, evaluate their pharmacological potential, and promote sustainable use of plant resources.

In India, traditional and folk medicinal practices utilize approximately 25,000 distinct plant-based formulations with demonstrable efficacy (Pandey, *et al.*, 2013).<sup>2</sup> Recent studies have documented traditional knowledge



regarding medicinal plants among various Indian communities, emphasizing the significance of these plants in local culture and their potential for sustainable use (Kumar & Singh, 2022a).<sup>3</sup> Numerous reasons for this widespread adoption have been suggested by academics, encompassing factors like affordability, ease of access, widespread availability, reasonable expenses, a low incidence of adverse effects, straightforwardness, safety, and evolving societal needs and beliefs (Zakaria, D.M. *et al.*, 2011).<sup>4</sup> Ethnomedicinal research, which systematically documents the usage patterns, preparation methods, and cultural significance of medicinal flora, has gained momentum due to its potential to contribute to novel therapeutic discoveries and sustainable resource management (Rawat *et al.*, 2023; Singh, 2023).<sup>5,6</sup> Previous studies in neighbouring regions have demonstrated that detailed ethno botanical assessments offer insights into both widely known and locally unique species, thereby laying the groundwork for pharmacological explorations and conservation strategies (Chandrashekhar, 2021).<sup>7</sup> For instance, ethno botanical surveys reveal that medicinal plants serve not only as treatments for ailments but also as sources of cultural identity and heritage for the communities that utilize them (Gowthami *et al.*, 2021).<sup>8</sup> Plant species availability and ethno-medicinal knowledge are crucial to the continual growth of the herbal medicine trade and pharmaceutical industries. Moreover, the growing interest in the documentation and conservation of medicinal plants is crucial for preserving traditional knowledge amidst rapid urbanization and environmental changes threatening these age-old practices (Chen *et al.*, 2016).<sup>9</sup> Ethnomedicinal documentation offers valuable insights for preserving traditional knowledge and identifying plants of therapeutic importance. This study surveyed Sardhana, Rotha, Kankarkhera, Meerut Cantt., Mawana, Dabathawa, Pohalli, Modipuram, Paratapur, Arya Nagar, and nearby areas of Meerut district, Uttar Pradesh, to record medicinal plant species and their folklore uses. The findings provide an updated account of local ethnomedicinal resources, highlighting their relevance for community health care, biodiversity conservation, and potential future pharmacological research.

## Materials & Methods

### Study Area

The research was conducted in and around Meerut City, Uttar Pradesh, situated at 28.9845° N latitude and 77.7064° E longitude on the fertile alluvial plains of the Ganga and Hindon rivers. The region receives an average annual rainfall of approximately 586 mm, concentrated between June and September, and supports extensive agriculture due to the nutrient-rich alluvial soils deposited by both rivers. Previous floristic studies have reported the diversity of Meerut district either in whole or in part (Dixit & Pandey (1984);<sup>10</sup> Jain & Puri (1984);<sup>11</sup> Narain, S. and Mishra, S., (2008);<sup>12</sup> Singh, A., & Singh, P. K. (2009);<sup>13</sup> Prakash (2011);<sup>14</sup> Singh & Dubey (2012);<sup>15</sup> Shukla *et al.* (2014);<sup>16</sup> Om Prakash, V K Gupta *et al.* (2017);<sup>17</sup> Kiran, Usha *et al.* (2021).<sup>18</sup> The present study was designed to complement these earlier works by focusing on the diversity, traditional uses, and conservation status of medicinal plants employed by local communities in Meerut district, thereby contributing additional data to the ethno-medicinal records of Uttar Pradesh.

### Data Collection

Ethnobotanical data were collected during multiple field surveys conducted throughout 2023 at regular intervals in Sardhana, Rotha, Kankarkhera, Meerut Cantonment, Mawana, Dabathawa, Pohalli, Modipuram, Paratapur, Arya Nagar, and adjacent areas. A semi-structured questionnaire was employed to obtain information from local Vaidyas and herbal practitioners regarding plant names (vernacular and scientific), plant parts used, preparation methods, therapeutic applications, and associated folklore. Direct field observations were combined with oral testimonies to ensure comprehensive documentation.

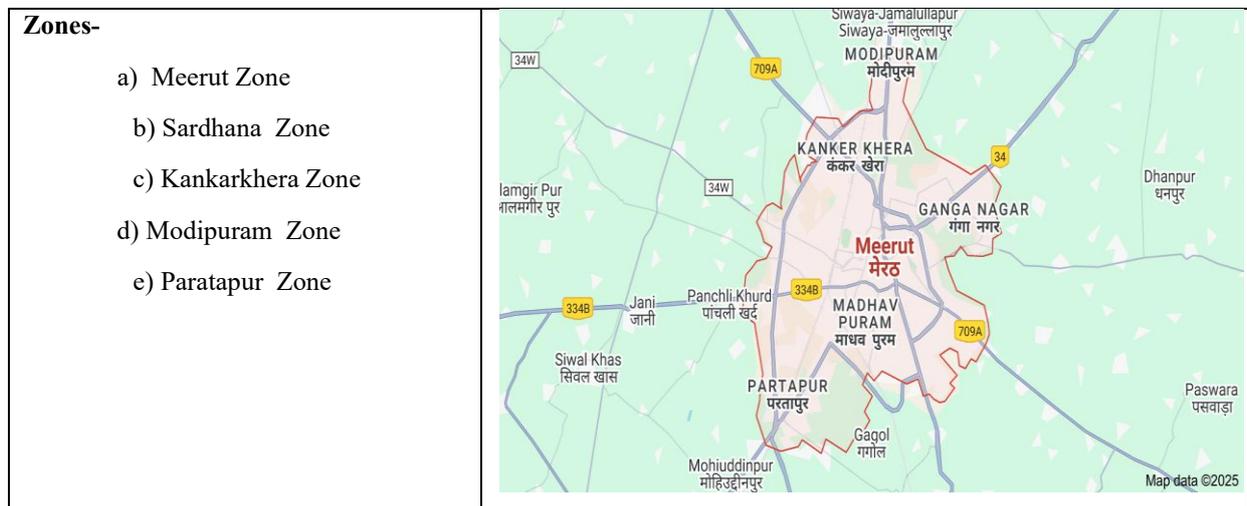
### Taxonomic Verification and Voucher Specimens

Preliminary identification of plants was provided by local practitioners, and all collected specimens were authenticated by a taxonomist from the Dravyaguna Department, Meerut Ayurvedic Medical College & Hospital. Voucher specimens were prepared following standard herbarium techniques and deposited in the departmental collection for future reference. The recorded species were cross-verified with regional floras and compared with authentic specimens at the Herbarium of the Botanical Survey of India, Northern Circle, Dehradun (BSD), to ensure accurate nomenclature and classification.

### Data Analysis

Documented species were categorized by family, genus, growth habit, and plant parts used. The frequency of use for each life form and plant part was calculated and expressed as percentages of the total species recorded. When counting useful plant parts, species contributing multiple parts were counted in each relevant category, leading to cumulative totals higher than unique species count. Results were represented through descriptive statistics and visualized in charts and tables to highlight usage patterns, ailment categories, and dominant species. Cross-comparison with earlier ethnomedicinal studies from northern India was undertaken to identify similarities, unique practices, and trends in disease management.

Figure : Study Site Map



### Result and discussion

The ethnomedical survey conducted in Meerut, Uttar Pradesh, India, highlights a rich diversity of plant species used traditionally for healthcare, with variations in the types of ailments treated. Comparatively, similar studies in different geographic and cultural contexts reveal that the reliance on local flora for medicinal purposes is a widespread phenomenon. Ethnobotanical survey in Saharanpur District highlighted the vital role of traditional knowledge in healthcare, documenting a wide range of medicinal plants and advocating for their conservation



and sustainable utilization (Kumar & Singh, 2022b).<sup>19</sup> Their findings closely mirror those of the present study, reinforcing the significance of ethnobotanical practices in supporting local health systems.

A total of 107 plant species belonging to 44 families and 86 genera were documented from the Meerut region (Table 01). Among them, trees were dominant (54 species; 50.5%), followed by herbs (27 species; 25.2%), shrubs (18 species; 16.8%), climbers (8 species; 7.5%), and grasses (1 species; 0.9%) (Figure 2). The Fabaceae family was represented by the highest number of species (15), followed by Moraceae (11 species), Apocynaceae (9 species), and Rutaceae (6 species) (Figure 3). This pattern indicates that a few dominant families account for a substantial proportion of the documented flora, highlighting their ecological importance and adaptive success within the study area. Similar dominance of Fabaceae and Moraceae has also been reported in other regional floristic surveys (Pandey, R. K. et al. 2018, Singh et al. 2025, Maurya et al., 2015).<sup>20,21,22</sup> The breakdown of plant types shows the prevalence of trees, which comprised approximately (50.5%) of the species identified. This trend is consistent with findings from other ethno-botanical surveys in Uttar Pradesh, where tree species were also prominently documented for their availability and medicinal properties (Meena *et al.* 2017).<sup>23</sup> The significant use of herbs (25.23%), and shrub (16.82%) also reflects the versatility and accessibility of these life forms for common ailments.

With respect to plant parts used, bark was reported in the highest number of species (45), followed by leaves (42), fruits (33), roots (32), flowers (17), seeds (13), latex (9), whole plant (8), stem (4), oil (3), rhizome (2), and heartwood (1) (Figure 4). Several species were noted to provide multiple useful parts. For example, *Azadirachta indica* contributed leaves, bark, flowers, and roots; *Ficus benghalensis* was valued for bark, aerial roots, and latex. These plants were used by the locals for food, fodder, medicine, and other aspects of their existence. The information was gathered such as plants regional names, plant parts that were used, and the application technique were noted. Overall, medicinal plants of the Meerut region are used to treat a wide range of ailments, including respiratory, digestive, dermatological, gynecological, and metabolic disorders, as well as fever, wounds, and infections.

The traditional medicinal practices documented in Meerut underscore the high degree of practical knowledge among local practitioners in harnessing the therapeutic potential of indigenous plants. For instance, *Calotropis procera* is traditionally applied to wasp stings for rapid relief, a practice supported by pharmacological studies showing its latex suppresses histamine-, bradykinin- and prostaglandin-mediated inflammation (Arya & Kumar, 2005)<sup>24</sup> and reduces swelling in experimental models (Sangraula et al., 2001).<sup>25</sup> In addition, the emphasis on the treatment of diabetes and skin diseases among the local population aligns with findings from other ethno botanical studies, including those conducted in regions like Mayurbhanj, where similar plants were documented for treating common ailments in areas with limited access to modern healthcare (Rout *et al.*, 2009).<sup>26</sup> *Ocimum tenuiflorum* (L.), widely recognized for its role in alleviating respiratory ailments, holds a significant place in the traditional pharmacopeia of the region, particularly in the management of chronic respiratory conditions (Suhitha et al., 2012).<sup>27</sup> Notably, the same study reports that diabetes treatment represents the most common therapeutic application, with 24 species documented, underscoring a broader pattern in alternative medicine where herbal remedies are frequently directed toward chronic health disorders (Suhitha et al., 2012).<sup>27</sup> The leaves of *Achyranthes aspera* (Apamarg) serve multiple purposes: they are used to treat Haemorrhoids, wound, and alleviate GI disorders, while the seeds have diuretic effects. This recognition of diverse therapeutic applications corresponds with findings that have documented the plant's bioactive compounds, such as alkaloids and phenols, contributing to its medicinal efficacy (Talreja, Shreya & Tiwari, 2023).<sup>28</sup>

**Figure 2: Habit pattern of different plant species.**





S. No	Botanical Name	Family	Habit	Hindi Name	Useful Parts	Medicinal Uses
1	Abrus precatorius L.	Fabaceae	Climber	Gunja	Seeds & Roots	Diabetes, Malaria, Inflammation & Immune Disorders.
2	Acacia catechu (L. f.) Willd.	Fabaceae	Tree	Khadir	Bark & Latex	Leucorrhoea, Leprosy, Gastritis, Sore Throat & Oral Infection.
3	Acacia farnesiana (L.) Willd.	Fabaceae	Shrub	Keekar	Bark & Latex	Diarrhoea, Wound, Headache & Stomach Cancer.
4	Acacia nilotica (L.) Delile.	Fabaceae	Tree	Babbul	Bark	Diarrhoea, Toothache, Tonsillitis, Stomatitis, Epiphora, Bronchitis, Cough & Eczema.
5	Achyranthes aspera L.	Amaranthaceae	Herb	Apamarg	Whole plant	Migraine, Dentalgia, Deafness, Asthma, Cough, Cholera & Hemorrhoids.
6	Acorus calamus L.	Acoraceae	Herb	Vacha	Roots	Improve Memory, Intellect, Paralysis, Epilepsy & Hysteria.
7	Aegle marmelos (L.) Corrêa	Rutaceae	Tree	Bilva	Fruit, Leaves & Bark	Cholera, Diarrhoea, Dysentery, Dyspepsia & Stomachalgia.
8	Albizia lebbek (L.) Willd.	Fabaceae	Tree	Shirish	Bark, Seeds, Leaves & Flowers	Allergic Condition, Urticaria, Leprosy, Wounds & Neuralgia.
9	Aloe vera (L.) Burm. f.	Asphodelaceae	Herb	Ghritkumari	Leaves	Skin Diseases, Amenorrhoea, Hepatopathy, Spleenopathy & Constipation.
10	Alstonia scholaris (L.) R. Br.	Apocynaceae	Tree	Saptaparn	Leaves & Bark	Malarial Fever, Urticaria, Skin Disease, Pruritus, Bronchitis & Asthma.
11	Andrographis paniculata (Burm.) Wall. ex Nees	Acanthaceae	Herb	Kalmegh	Whole plant	Sclerosis, Depression, Diarrhoea, Dysentery, Cholera, Lupus & Diabetes.
12	Argemone mexicana L.	Papaveraceae	Herb	Satyanashi	Whole plant	Worm Infestation, Leprosy, Skin Diseases, Fever & Inflammation.

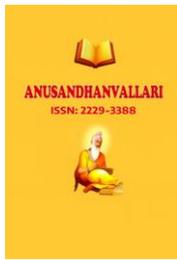


13	Argyreia nervosa (Burm. f.) Bojer	Convolvulaceae	Climber	Vidhara	Leaves & Roots	Diabetic wounds, Inflammation, Rheumatism, Wounds, Internal Bleeding & Elephantiasis.
14	Artocarpus heterophyllus Lam.	Moraceae	Tree	Kathal	Fruit & Latex	Fever, Boils, Wounds, Skin Diseases, Convulsions, Diuretic & Snake Bite.
15	Arundo donax L.	Poaceae	Herb	Pater	Roots	Menstrual Disorders, Headache, High Blood Pressure, Dropsy & Cancer.
16	Asparagus racemosus Willd.	Asparagaceae	Shrub	Shatavari	Roots	Dysentery, Rheumatism, Nervous Disorders, Galactagogue & Rejuvenation.
17	Azadirachta indica (L.) A. Juss.	Meliaceae	Tree	Neem	Leaves, Bark, Flowers & Roots.	Tubercular glands, Leprosy, Skin Diseases, Leucoderma, Eczema, Pruritus & Malarial Fevers.
18	Bambusa bambos (L.) Voss.	Poaceae	Herb	Bans	Young Leaves & young shoots	Lumbago, Hemorrhoids, Gonorrhoea, Burning Sensation & Strangury.
19	Bauhinia purpurea L.	Fabaceae	Tree	Kanchnar Lal	Bark, Leaves & Flowers	Rheumatism, Thigh Swelling, Convulsion, Delirium (Febris) & Fever.
20	Bauhinia racemosa Lam.	Fabaceae	Tree	Kanchnarshweta	Bark, Leaves & Flowers	Malaria, Tumors, Dysentery & Diarrhoea.
21	Bauhinia variegata L.	Fabaceae	Tree	Kanchnar	Bark, Leaves & Flowers	Wounds, Skin Diseases, Scrofula, Glandular Swelling & Sore Throat.
22	Boerhavia diffusa L.	Nyctaginaceae	Herb	Punarnava	Roots	Arthritis, Cough Impotency, Skin Disorders, Anaemia & Hepatic Disorders.
23	Bombax ceiba L.	Malvaceae	Tree	Semal	Bark, Flowers & Leaves	Menorrhagia, Haemoptysis, Tuberculosis, Influenza & Haemorrhoids.

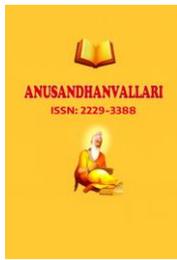


24	Bryophyllum pinnatum (Lam.) Kurz.	Crassulaceae	Herb	Pattarchatta	Leaves	Wounds, Hemorrhoids, Menorrhagia, Boils, Sloughing Ulcers, Burns, Diarrhoea, Dysentery, Headache, Vomiting & Bronchitis.
25	Caesalpinia bonduc (L.) Roxb.	Fabaceae	Climber	Putikaranj	Seeds & Roots	Skin Diseases, Leprosy, Dysentery, Diarrhoea, Diabetes, Chronic Fever & Hemorrhoids.
26	Callistemon citrinus (Curtis) Skeels	Myrtaceae	Small Tree	Bottlebrush	Leaves and Essential Oil	Diarrhoea, dysentery and rheumatism.
27	Calotropis gigantea (L.) Dryand.	Apocynaceae	Shrub	Madar	Leaves & Roots	Leprosy, Elephantiasis, Snakebite, Asthma, Headache & Skin Diseases.
28	Calotropis procera (Aiton) Dryand.	Apocynaceae	Shrub	Raktark	Leaves & Roots	Rheumatism, Filariasis, Wounds, Glandular Swelling & Eczema.
29	Cannabis sativa L.	Cannabaceae	Herb	Bhaang	Whole plant	Malarial Fever, Diarrhea, Insomnia&Tumor.
30	Carica papaya L.	Caricaceae	Tree	Papita	Fruit, Leaves & Latex	Dentalgia, Throat Disorders, Diarrhoea, Hemorrhoids, Paralysis & Skin Disorders.
31	Cassia fistula L.	Fabaceae	Tree	Amaltas	Bark	Diabetes, Piles, Kidney Disease, Menstrual Disease &Diarrhea.
32	Catharanthus roseus (L.) G.Don	Apocynaceae	Herb	Sadabahr	Leaves ,Flowers & Roots	Diabetes, Leukemia& Stomach ache.
33	Cissampelos pareira L.	Menispermaceae	Climber	Patha	Seeds, Bark, Leaves, Roots	Diarrhoea, Dysentery, Ulcer, Intestinal Worms, Splenomegaly, Diabetes & Menstrual Disorders.
34	Citrus aurantiifolia (Christm.) Swingle	Rutaceae	Tree	Neembu	Fruit	Pimples, Skin Diseases, Bronchitis, Asthma, Hiccough & Inflammation.
35	Citrus limon (L.) Osbeck	Rutaceae	Tree	JambiriNeembu	Fruit	Pimples, Skin Diseases, Bronchitis, Asthma, Hiccough & Inflammation.

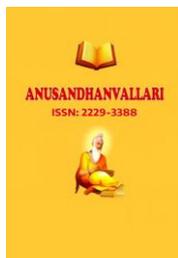
36	Citrus medica L.	Rutaceae	Tree	<i>Mitha Neembu</i>	Fruit	Headache, Hiccough, Cough, Emesis, Worm Infection, Bloody Diarrhoea & Fever.
37	Citrus reticulata Blanco	Rutaceae	Tree	<i>Narangi</i>	Fruit	Asthma, Cough, Emesis, Pain, Dyspepsia & Inflammation.
38	Clitoria ternatea L.	Fabaceae	Climber	<i>Aparajita</i>	Roots, Leaves, Flowers & Seeds	Cough, Small Pox, Piles, Cold & Asthma.
39	Cryptolepis dubia (Burm.f.) M.R.Almeida	Apocynaceae	Climber	<i>Jambupatrasariva</i>	Roots, Stem and Leaves	Fever, Anorexia, Leprosy, Leucorrhoea, Diabetes, Asthma, Cough, Pruritis & Rickets.
40	Curcuma longa L.	Zingiberaceae	Herb	<i>Haldi</i>	Rhizome	Arthritis, Muscle Sprains, Swelling, & Pain
41	Cyanthillium cinereum (L.) H.Rob.	Asteraceae	Herb	<i>Sahdevi</i>	Whole plant	Fever, Ascaris, Colic, Dysuria, Leprosy, Jaundice, Insomnia, Leucoderma & Scabies.
42	Cymbopogon citratus (DC.) Stapf	Poaceae	Herb	<i>Bhutrin</i>	Roots	Flatulence, Gastric Irritation, Fever, Anorexia & Bronchitis.
43	Cyperus rotundus L.	Cyperaceae	Herb	<i>Nagarmotha</i>	Roots	Conjunctivitis, Vomiting, Diarrhoea Colitis, Dyspepsia & Eczema.
44	Dalbergia sissoo DC.	Fabaceae	Tree	<i>Sheesham</i>	Leaves & Bark.	Blood Disorders, Dysentery, Dyspepsia, Leucoderma, & Diabetes.
45	Datura metel L.	Solanaceae	Shrub	<i>Dhatura</i>	Seeds	Insanity, Asthma, Cholera, Gout & Scorpion Bite.
46	Euphorbia heterophylla L.	Euphorbiaceae	Herb	<i>Chhoti Dudhi</i>	Latex	Asthma, Constipation, Skin Disease, Skin Tumor & Gonorrhoea.
47	Euphorbia hirta L.	Euphorbiaceae	Herb	<i>Badi Dudhi</i>	Latex	Leucorrhoea, Skin Infections, Cough, Coryza, Bronchitis & Asthma.
48	Ficus arnottiana (Miq.) Miq.	Moraceae	Tree	<i>Kapitam</i>	Bark	Leprosy, Scabies, Wounds, Diabetes, Burning Sensation, Pruritis & Vaginal Disorders.



49	Ficus benghalensis L.	Moraceae	Tree	Bargad	Latex, Roots-fibers, Leaves, Seeds & Bark	Ulcers, Vomiting, Leprosy, Piles, Gonorrhoea, Syphilis & Dysentery.
50	Ficus carica L.	Moraceae	Tree	Anjeer	Fruit & Bark	Warts, Piles, Corns, Dental Abscesses & Anaemia.
51	Ficus elastica Roxb. ex Hornem.	Moraceae	Tree	Rubber	Bark	Anaemia.
52	Ficus lacor Buch.-Ham. Syn. Ficus infectoria Roxb.	Moraceae	Tree	Pakad	Fruit & Bark	Otitis, Lymphaedinitis, Haemorrhage, Diarrhoea, Hemorrhoids, Dysuria & Abdominal Ache.
53	Ficus palmata Forssk.	Moraceae	Shrub	Khemri	Fruit & Bark	Constipation, Diabetes, Warts, Lungs Disorders & Urinary Disorders.
54	Ficus racemosa L.	Moraceae	Tree	Gular	Fruit & Bark	Edema, Hemorrhages, Heals Ulcers, & Cures Diseases Of Female External Organs. Decoction Of Bark Is Used For Gargling , Vaginal Douche.
55	Ficus religiosa L.	Moraceae	Tree	Peepal	Fruit & Bark	Wound, Diabetes, Gonorrhoea & Skin Disorders.
56	Gmelina arborea Roxb.	Lamiaceae	Tree	Gambhari	Fruit & Bark	Stomachic, Galactagogue, Laxative, Anthelmintic, Piles, Fever & Headache.
57	Helicteres isora L.	Malvaceae	Shrub	Jmarodphali	Fruit	Diarrhoea, Arthritis, Diabetes, Dysentery, Headache, Hiccough & Wound.
58	Hibiscus rosasinensis L.	Malvaceae	Shrub	Gudhal	Roots, Leaves & Flowers	Osteoarthritis, Boils, Cough, Sprain & Wounds.
59	Jasminum auriculatum Vahl	Oleaceae	Shrub	Juhi	Leaves, Flowers & Oil	Mouth Ulcer & Tuberculosis.
60	Jasminum officinale L.	Oleaceae	Climber	Chameli	Leaves, Flowers & Roots	Otorrhoea, Ringworm, Menstrual Disorders, Skin Disease & Dyspepsia.



61	Jasminum sambac (L.) Ait.	Oleaceae	Shrub	<i>Mallika</i>	Leaves, Flowers & Roots	Leucorrhoea, Leprosy, Gastritis, Sore Throat & Mouth Infections.
62	Justicia adhatoda L.	Acanthaceae	Shrub	<i>Vasa</i>	Leaves	Bronchitis, Cold, Whooping Cough & Asthma.
63	Kigelia africana indi(Lam.) Benth.	Bignoniaceae	Tree	<i>Balam Kheera</i>	Fruit & Bark	Wound Healing, Malaria, Skin Disorders, Eczema, Inflammation, Epilepsy & Gynecological Disorders.
64	Lagerstroemia indica L.	Lythraceae	Small tree	<i>Jarul</i>	Roots	Wound, Fever, Constipation & Dysuria.
65	Litchi chinensis Sonn. Syn. Nephelium litchi Cambess.	Sapindaceae	Tree	<i>Lichi</i>	Fruit	Cough, Cardiac & Skin Disorders.
66	Madhuca longifolia (J.Koenig ex L.) J.F.Macbr.	Sapotaceae	Tree	<i>Mahua</i>	Fruit & Seeds	Cough, Cardiac Disorders, Wound, Leprosy & Blood Disorders.
67	Magnolia champaca (L.) Baill. ex Pierre.	Magnoliaceae	Tree	<i>Champa</i>	Stem bark and Root bark	Abscesses, Dysmenorrhoea, Cardiac Debility, Gout, Malarial Fever & Leprosy.
68	Mangifera indica L.	Anacardiaceae	Tree	<i>Aam</i>	Fruit, Seeds & Bark	Emesis, Syphilis, Wound, Diarrhoea & Jaundice.
69	Manilkara zapota (L.) P.Royen.	Sapotaceae	Tree	<i>Cheeku</i>	Fruit	Cough, Rhinitis & Diarrhoea.
70	Melia azedarach L.	Meliaceae	Tree	<i>Bakain</i>	Roots, Bark & Leaves	Leprosy, Scrofula, Gingivitis, Pyrexia, Bleeding Piles & Rheumatism.
71	Mimosa pudica L.	Mimosaceae	Herb	<i>Laajwanti</i>	Whole plant	Urogenital Disorders, Piles, Dysentery, Sinus & Wounds.
72	Mimusops elengi L.	Sapotaceae	Tree	<i>Bakul</i>	Stem & Bark	Bleeding Gums, Pyorrhoea, Dental Caries & Loose Teeth, Heart Diseases, Leucorrhoea & Menorrhagia.



73	Moringa oleifera Lam.	Moringaceae	Tree	Sahjan	Fruit, Bark & Flowers	Fever, Epilepsy, Inflammation, Wound, Hypertension & Diabetes.
74	Morus alba L.	Moraceae	Tree	Shahtut	Fruit	Fever, Arthritis Pain, Blood Pressure & Headache.
75	Morus nigra L.	Moraceae	Tree	Shatut	Fruit	Asthma, Cough, Bronchitis, Hypertension, Diabetes & Rheumatism.
76	Murraya koenigii (L.) Spreng.	Rutaceae	Shrub	Meetha Neem	Leaves	Diarrhoea, Constipation, Diabetes & Cancer.
77	Musa paradisiaca L.	Musaceae	Herb	Kela	Fruit & Leaves	Constipation, Diarrhoea, Dysentery, Fever & Piles.
78	Neolamarckia cadamba (Roxb.) Bosser.	Rubiaceae	Tree	Kadamb	Fruit & Bark	Fever, Gastric Trouble, Urinary Disorder, Skin Diseases & Anaemia.
79	Nerium indicum Mill.	Apocynaceae	Shrub	Kaner	Roots & Roots Bark	Stomatitis, Arthritis, Pruritus, Cough & Bronchitis.
80	Nyctanthes arbor-tristis L.	Oleaceae	Tree	Harsingar	Leaves, Flowers & Bark	Inflammation, Sciatica, Dyspepsia, Cough, Asthma & Hemorrhoids.
81	Ocimum tenuiflorum L. Syn. Ocimum sanctum L.	Lamiaceae	Herb	Shayam Tulsi	Leaves, Roots & Bark	Arthritis, Cancer, Acidity, Diabetes & Toothache.
82	Phoenix sylvestris (L.) Roxb.	Arecaceae	Tree	Khajur	Fruit	Cardiac Disorders, Fever, Vomiting & Abdominal Disorders.
83	Phyllanthus emblica L. Syn. Emblica officinalis Gaertn.	Phyllanthaceae	Tree	Amla	Fruit	Dyspepsia, Rejuvenating, Pain, Inflammation, Anaemia & Jaundice.
84	Physalis minima L.	Solanaceae	Herb	Tankari	Fruit	Appetizer, Anticancerous, Diuretic, Laxative & Tonic.



85	Plumbago zeylanica L.	Plumbaginaceae	Herb	Chitrak	Roots, Bark	Inflammation, Colic, Leucoderma, Cough, Amenorrhoea, Hepatomegaly & Splenomegaly.
86	Plumeria alba L.	Apocynaceae	Tree	Gulachin	Roots, Leaves, Latex & Bark	Constipation, Rheumatism, Itching, Dentalgia & Swelling.
87	Plumeria rubra L.	Apocynaceae	Tree	Lal Champa	Roots, Leaves, Latex & Bark	Ulcers, Skin Diseases, Inflammations, Arthritis & Constipation.
88	Polyalthia longifolia (Sonn.) Thw.	Annonaceae	Tree	Ashok	Bark	Fever, Skin Disease, Diabetes, Hypertension & Worm.
89	Psidium guajava L.	Myrtaceae	Tree	Amrud	Fruit & Leaves	Burning Sensation, Dysentery, General Debility, Leucorrhoea & Epilepsy.
90	Punica granatum L.	Lythraceae	Shrub	Anar	Fruit, Leaves & Bark	Anaemia, Hyperdipsia, Anorexia, Pharyngodynia, Vomiting, Ulcers & Scurvy.
91	Ricinus communis L.	Euphorbiaceae	Shrub	Erand	Seeds Oil	Cough, Haemorrhoids, Jaundice, Dysentery, Sciatica, Gout, Ophthalmic Diseases & Abdominal Diseases.
92	Saccharum officinarum L.	Poaceae	Herb	Ganna	Stem	Arthritis, Boils, Tumor, Cough, Diarrhoea & Hiccups.
93	Santalum album L.	Santalaceae	Tree	Chandan	Heart wood	Treatment Of Gonorrhoea, Skin Disease, Kidney Problems, Mental Disorders, Treating Dysuria & Cystitis.
94	Saraca indica L.	Fabaceae	Tree	Ashok	Bark & Flowers	Menorrhagia, Leucorrhoea, Internal Bleeding, Haemorrhoids, Eye Disease, Fever & Bone Fracture.
95	Senna occidentalis (L.)	Fabaceae	Herb	Kasaundi	Flowers, Seeds & Leaves	Scrofula, Epilepsy, Cough, Hiccough, Jaundice, Intestinal Worms, Strangury &

						Ascites.
96	Sida cordifolia L.	Malvaceae	Herb	Bala	Whole plant	Filaria, Osteo-Arthritis, Insanity, Dysuria Diarrhoea & Leucorrhoea.
97	Sida rhombifolia L.	Malvaceae	Herb	Mahabala	Whole plant	Headache, Snakebite, Diarrhoea, Rheumatism, Emollient, Depression & Urinary tract Infection.
98	Solanum indicum L.	Solanaceae	Shrub	Badi Kateri	Roots & Berries	Throat Disorder, Hiccough, Inflammation, Fever, Anorexia & Diarrhoea.
99	Syzygium cumini (L.) Skeels	Myrtaceae	Tree	Jamun	Fruit, Seeds, Leaves & Bark	Jaundice, Diabetes, Anaemia, Leucorrhoea, Fever & Vomiting.
100	Tamarindus indica L.	Fabaceae	Tree	Imli	Fruit & Leaves	Stomatitis, Diarrhoea, Haemorrhoids, Dysentery, Anorexia & Diabetes.
101	Tectona grandis L. f.	Lamiaceae	Tree	Sagon	Bark & Flowers	Dysentery, Diabetes, Hyperacidity & Leprosy.
102	Terminalia catappa L.	Combretaceae	Tree	Jangli Badam	Fruit & Bark	Cancer, Diabetes, Liver Disorder, Dysentery & Leprosy.
103	Tinospora cordifolia (Willd.) Miers	Menispermaceae	Climber	Giloy	Stem, Leaves, Root	Fever, boosting immunity, treating digestive, detoxification, joint pain / inflammation.
104	Vitex negundo L.	Lamiaceae	Shrub	Nirgundi	Leaves, Roots, Bark, Seeds	Joint Pain, Inflammation, Bronchitis, Asthma, Wounds & Fever.
105	Withania somnifera (L.) Dunal	Solanaceae	Shrub	Ashwagandha	Leaves & Roots Bark	Arthritis, Diabetes, General Debility, Sexual Debility, Spermatorrhoea, Rheumatism, Leucorrhoea & Leucoderma.
106	Zingiber officinale Rosc.	Zingiberaceae	Herb	Adrakh	Rhizome	Cough, Fever, Rhinitis, Bronchitis & Headache.
107	Ziziphus jujuba Mill.	Rhamnaceae	Tree	Ber	Fruit & Bark	Epistaxis, Cough, Diarrhoea, Dysentery, Piles, Leucorrhoea, Rheumatoid Arthritis & Small Pox.



*Albizia lebbek* (L.) Willd. Has been extensively studied for its phytochemical richness and pharmacological potential. Ethno-botanical surveys indicate that parts of this plant, including its bark and leaves, are traditionally used in the treatment of snakebites (Shah *et al.*, 2018).<sup>29</sup> Local traditions report the use of *Clitoria ternatea* L. root juice as an expectorant in chronic bronchitis. Similar uses for cough and airway congestion are noted in ethnomedicinal surveys across India (Singh *et al.*, 2018).<sup>30</sup> Pharmacological studies confirm antiasthmatic and bronchodilatory activity of root extracts (Taur & Patil (2011)).<sup>31</sup> Similar uses are reported across Southeast Asia, where flavonoid- and anthocyanin-rich extracts are employed for airway and inflammatory conditions (Athallah *et al.*, 2024),<sup>32</sup> aligning with cross-cultural reliance on respiratory botanicals. Juice of *Ageratum conyzoides* L. leaves is used for *Andrographis paniculata* treatment and insect repellent by locals.

It was found that the knowledge of treatment of minor health problems was available and being practiced by local people of Meerut. The medicinal plants recognized from the different study sites are used for various kinds of diseases like diabetes, skin disease, wounds, dysentery, haemorrhage, leucorrhoea, haemorrhoids, fever, dyspepsia, menstrual disease, worm, constipation, diarrhoea, asthma, inflammation, malaria, ulcer, intestinal worms, splenomegaly, conjunctivitis, vomiting, colitis, eczema etc. In general, *Cassia fistula* L., *Polyalthia longifolia* (Sonn.) Thw., *Ficus arnottiana* (Miq.) Miq., *Ficus palmata* Forssk., *Syzygium cumini* (L.) Skeels, *Morus nigra* L., *Tamarindus indica* L., *Tectona grandis* L. f., *Murraya koenigii* (L.) Spreng., *Andrographis paniculata* (Burm.) Wall. ex Nees, *Moringa oleifera* Lam., *Dalbergia sissoo* DC., *Ocimum tenuiflorum* L., *Withania somnifera* (L.) Dunal, *Nerium indicum* L., *Caesalpinia bonduc* (L.) Roxb., *Catharanthus roseus* (L.) G. Don., *Cissampelos pareira* L., *Helicteres isora* L., *Terminalia catappa* L. were used in the treatment of diabetes in survey area.

This Survey shows that variety of plants being used in local medicine in Meerut to treat skin diseases, including *Polyalthia longifolia* (Sonn.) Thw., *Bauhinia variegata* L., *Neolamarckia cadamba* (Roxb.) Bosser, *Artocarpus heterophyllus* Lam., *Azadirachta indica* (L.) A. Juss., *Citrus aurantiifolia* (Christm.) Swingle., *Citrus limon* (L.) Osbeck, *Plumeria rubra* L., *Jasminum officinale* L., *Aloe vera* (L.) Burm. f., etc. were used in various skin diseases. *Aloe vera* (L.) Burm. f., *Nerium indicum* Mill., *Hibiscus rosa-sinensis* L., *Saccharum officinarum* L. were used for the treatment of arthritis. For treatment of leucorrhoea medicinal plants like *Saraca indica* L., *Psidium guajava* L. *Syzygium cumini* (L.) Skeels, *Acacia catechu* (L. f.) Willd., *Ziziphus jujuba* Mill. were used. Furthermore, scientific studies are usually carried out using extracts from plants; it may be time to conduct research using formulations exactly as folk medicinal practitioners use to get relevant results.

## Conclusion

In summary, the ethno-medicinal survey conducted in Meerut, Uttar Pradesh, has provided a comprehensive account of the traditional uses of local flora, documenting 107 plant species across 44 families and 86 genera. The findings indicate that a vast majority of these species offer multiple medicinally valuable parts, with the leaves and bark being predominantly utilized by indigenous communities. These plant species are integral to addressing a wide spectrum of human ailments, ranging from diabetes and skin diseases to gastrointestinal disorders, inflammatory conditions, and beyond.

The study highlights that traditional healthcare practices in this region, rooted in a rich legacy of indigenous knowledge, have not only contributed to the management of common diseases such as diabetes (with 24 distinct plant species reported for this condition) but also continue to play a pivotal role in the treatment of less commonly addressed disorders. The enduring presence of traditional healers as primary custodians of this

knowledge underscores the cultural and therapeutic importance of ethno-medicinal practices, ensuring the intergenerational transfer of valuable information.

Given the documented breadth of medicinal applications, the study underscores the national and international significance of the Meerut region's biodiversity. It is imperative that future strategies emphasize capacity building, policy intervention, and the establishment of market linkages, aimed at promoting the sustainable cultivation and commercial utilization of these medicinal species. Such strategies should be integrated with broader environmental protection and biodiversity conservation programs to bolster the entire healthcare ecosystem.

Moreover, the findings of this study serve as a crucial resource for herbal industries, community development initiatives, policymaking bodies, scientific institutions, researchers, and local farmers. They provide a platform for further scientific validation of the therapeutic methodologies employed by local practitioners, which may ultimately contribute to the development of novel therapeutic agents.

In conclusion, the ethno-medicinal profile of plants in Meerut not only reflects a robust traditional healthcare system but also emphasizes the urgent need for continued research and conservation efforts. The integration of ethno botanical wisdom with modern scientific validation holds promise for expanding therapeutic strategies and ensuring that the medicinal potential of the region's flora is preserved for future generations.

**Pictures of Most valuable Ethno-medicinal plants of Meerut region.**

**Plate no.1**



1. *Chitrak* (*Plumbago zeylanica* L.)

2. *Ashok* (*Saraca indica* L.)

3. *Vasa* (*Justicia adhatoda* L.)



4. *Amla* (*Phyllanthus emblica* L. Syn. *Emblica officinalis* Gaertn.)



5. *Vacha* (*Acorus calamus* L.)



6. *Harsingar* (*Nyctanthes arbor-tristis* L.)



7. *Sahjan* (*Moringa oleifera* Lam.)



8. *Marodphali* (*Helicteres isora* L.)

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