

Ethnobotanical Notes on Flora of Lakh Bahosi Bird Sanctuary, Kannauj, Uttar Pradesh, India

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ABSTRACT

The present study documents the ethnomedicinal importance of plant species occurring in and around Lakh Bahosi Bird Sanctuary, Kannauj, Uttar Pradesh, India. Field surveys were conducted over a period of two years and ethnobotanical information was collected through semi-structured interviews with local inhabitants and traditional healers possessing indigenous knowledge of medicinal plants. A total of 60 medicinal plant species belonging to 36 families were recorded and their therapeutic uses, plant parts utilized, and modes of application were documented. Fabaceae emerged as the dominant family represented by the highest number of species. The recorded plants were commonly used for the treatment of gastrointestinal disorders, skin diseases, respiratory ailments, diabetes and inflammatory conditions. Leaves were the most commonly utilised plant parts (43.9%), followed by seeds (10.6%), and fruits (9%). The study highlights the significance of traditional knowledge systems in primary healthcare and emphasizes the need for documentation and conservation of medicinal plant resources in wetland ecosystems. The findings provide baseline information for future pharmacological investigations and biodiversity conservation programmes. The plant species viz. *Ziziphus mauritiana*, *Cassia fistula*, *Tinospora cordifolia*, *Terminalia chebula*, and *Albizia lebbek* had the maximum utility. Hepatitis, jaundice, diabetes, respiratory disorders, and skin problems were the most often reported ailments. This study provides insights into advanced research initiatives in the field of pharmacognosy as well as to search for novel medicinal plants.

Keywords: Diversity, Medicinal plants, Wetlands, Traditional medicine system, Sustainable uses.

INTRODUCTION

India has used plants to treat disease and maintain health since ancient times [1]. An ethnobotanical study refers to the traditional applications of Indian medicinal plants by indigenous people. Today, millions of people still rely on these plants as vital components of traditional medicine and health care. 70% of rural Indians are thought to use traditional plant-based medicines as their main source of healthcare. The benefits of floral diversity to health care across civilisations have been widely recognised [2]. Over 50,000 species, representing over 13% of flowering plants, are reportedly used for medical purposes worldwide [3]. According to the World Health Organisation [4], 80% of people in developing nations solely use traditional medicines. They use medical procedures for their minor ailments or health care. There are some published surveys available concerning the alleged benefits of traditional medical treatments. Protected areas have an important role in the protection of biodiversity and medicinal plants [5]. So, the present study focuses on the availability and sustainable utilisation of medicinal plants in protected areas of the Lakh Bahosi Bird Sanctuary as well as changes in the floristic diversity of medicinal plants and their use at the community level, according to local and traditional healers.

Lakh Bahosi Bird Sanctuary is an important reservoir of medicinal plant diversity and native flora, underscoring the need for ongoing monitoring and conservation to preserve its rich biological resources [6,12].

The present study was conducted to document the medicinal plant species utilised by local communities residing in and around the sanctuary and to establish a comprehensive record of traditionally valuable ethnomedicinal plants [12]. Numerous plant species occurring within Lakh Bahosi Bird Sanctuary provide valuable resources to the local communities. Traditional knowledge regarding the utilisation of these plant species was documented through interviews conducted with indigenous people [13]. The findings revealed that plants are used for multiple purposes, including food, medicine, fodder, construction materials, and various cultural and religious practices. Several plant species, such as *Cassia fistula*, *Phyllanthus emblica*, *Terminalia arjuna*, and *Moringa oleifera* were found to be effective in treating a variety of illnesses. Among the plant parts used for therapeutic purposes, roots were the most frequently used, followed by leaves, fruits, seeds, bark, stems, and flowers. The study also indicated a gradual decline in traditional ethnobotanical knowledge among local inhabitants. Deforestation, urbanization, and contamination of lake water, which is confirmed by physico-chemical examination of lake water, are some of the causes that have led to this [13].

MATERIAL AND METHODS

Description of Study Site

The study site of the present study is Lakh Bahosi Bird Sanctuary and its adjacent areas.

It was established in 1988 with the intention of protecting and maintaining the wetland, with a focus on local and migratory birds and the preservation of their natural environment, which includes aquatic flora and animals [14]. Geographically, it lies between 26°54'47.50" N latitude and 79°39'19.20" E longitude and encompasses an area of approximately 80 km², making it one of the largest bird sanctuaries in India [6, 7, 14]. Lakh Bahosi Wildlife Sanctuary is about 38 km from the historic city of Kannauj. The Sanctuary is formed of two oxbow Jheels near the village of Bahosi [7,8]. Both the Jheels, Lakh and Bahosi are located near the Lower Ganga Canal, so the overflow and seepage of water accumulates in the Jheels, resulting in about 600 ha of shallow wetlands perfectly suitable for water birds. However, at least 50,000 waterfowl can still be drawn to at least 400 hectares in the deeper sections. The sanctuary has gained international conservation importance due to the occurrence of several globally threatened bird species, including the Greater Spotted Eagle and the Sarus Crane, along with substantial populations of migratory and resident waterbirds [6-8]. The Ministry of Environment & Forests, Government of India, defines this wetland as part of the National Wetland Conservation Program [14]. The designation of the area as a protected bird sanctuary plays a crucial role in safeguarding its biodiversity and wetland habitats from anthropogenic disturbances, habitat degradation, and unsustainable resource exploitation [7].

Engagement of local communities in conservation efforts at the bird sanctuary is very impactful in conserving more native flora and fauna [9]. However, agriculture, grazing, fishing, and groundwater recharge are some of the elements that contribute to pollution in Lakh Bahosi Jheel of the Bird Sanctuary.



Figure 1A: Location Map of Lakh Bahosi Bird Sanctuary

Source: mapsofindia.com

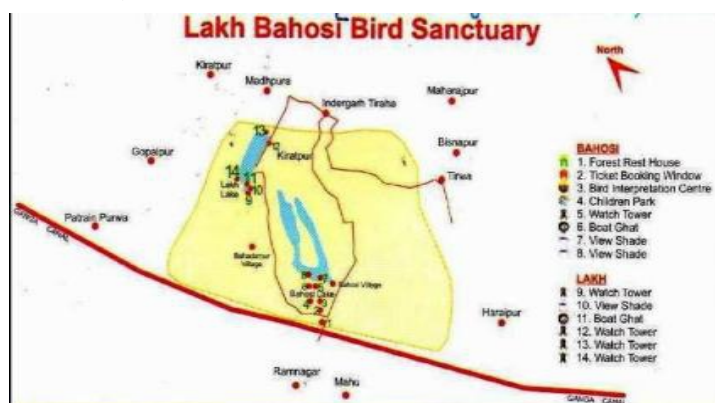


Figure 1B: Geographical Layout of Lakh Bahosi Bird Sanctuary, Kannauj

Source: mapsofindia.com

Plant Collection and Identification

Extensive field surveys have been done thrice in a year at the selected site.

During exploration, herbarium voucher specimens of each species have also been collected. All collected specimens have been identified by the key of species available in literature and other local flora [10].

Collection of Ethnomedicinal data

Ethnobotanical data were collected through a semi-structured questionnaire designed in accordance with the sampling methodology described by Jain [11]. Individuals possessing traditional knowledge of medicinal plants were selected as key informants for the study [14]. Information regarding local plant names, plant parts used, methods of preparation and administration, and other ethnobotanical uses was collected through informal discussions and questionnaire-based interviews. This involved a general conversation with the informants. A total of 10 key informants, comprising 8 males and 2 females aged between 55 and 75 years, were selected for the study. They were chosen on the basis of their expertise in using medicinal plants for either self-medication or the treatment of others. During field surveys, informants were requested to identify and demonstrate the medicinal plant species using their local names. The documented species were collected, taxonomically identified, and authenticated following standard botanical procedures [15].

RESULTS

The present study focused on the use of plants for medicinal purposes by the tribes in villages. It was observed that the indigenous people employed a wide variety of plants to heal various ailments (Plate 1A). A total of 60 medicinal plant species representing 36 botanical families were documented during the present study (Table 1). The information on the scientific name, family, plant parts used, and therapeutic uses of recorded plants is given in the table. The present study shows that almost all plant parts are used as medicine. Leaves are the plant parts most frequently used to treat illness, followed by fruits, seeds, bark, stems, and flowers. This suggests that leaves are more accessible and possess a higher concentration of bioactive compounds. Among the 36 families, Fabaceae was found to be dominant with 10 species (Figure 4). During the ethnomedicinal plant survey, the most common disease cure among the people was found to be Digestive/Gastrointestinal issues and Inflammatory conditions, while a minimum number of plants are used to cure Brain/Nervine Tonic and arthritis, which are included together in the other category. It is observed that a single plant may be used to cure many diseases, such as *Calotropis gigantea*, *Phyllanthus emblica*, and *Datura stramonium* (Table 1).

The data further shows that a broad range of diseases including anaemia, arthritis, asthma, diabetes, dysentery, fever & cold, skin diseases, and stomach disorders are treated using plant-based remedies. Notably, dysentery and snakebite/scorpion bite treatments showed higher usage of plant parts, indicating greater dependence on herbal remedies for these conditions.

The study also highlights the rich floristic diversity of the region, as a large number of plant species contribute to traditional healing practices. Different diseases are treated using different combinations of plant parts, reflecting the depth of indigenous knowledge.

The results also support earlier findings that dicotyledons dominate the flora, contributing the majority of species, genera, and families. The presence of a small number of monocots and pteridophytes further confirms the pattern of dicot dominance (above 85%), as reported in previous studies of the sanctuary.

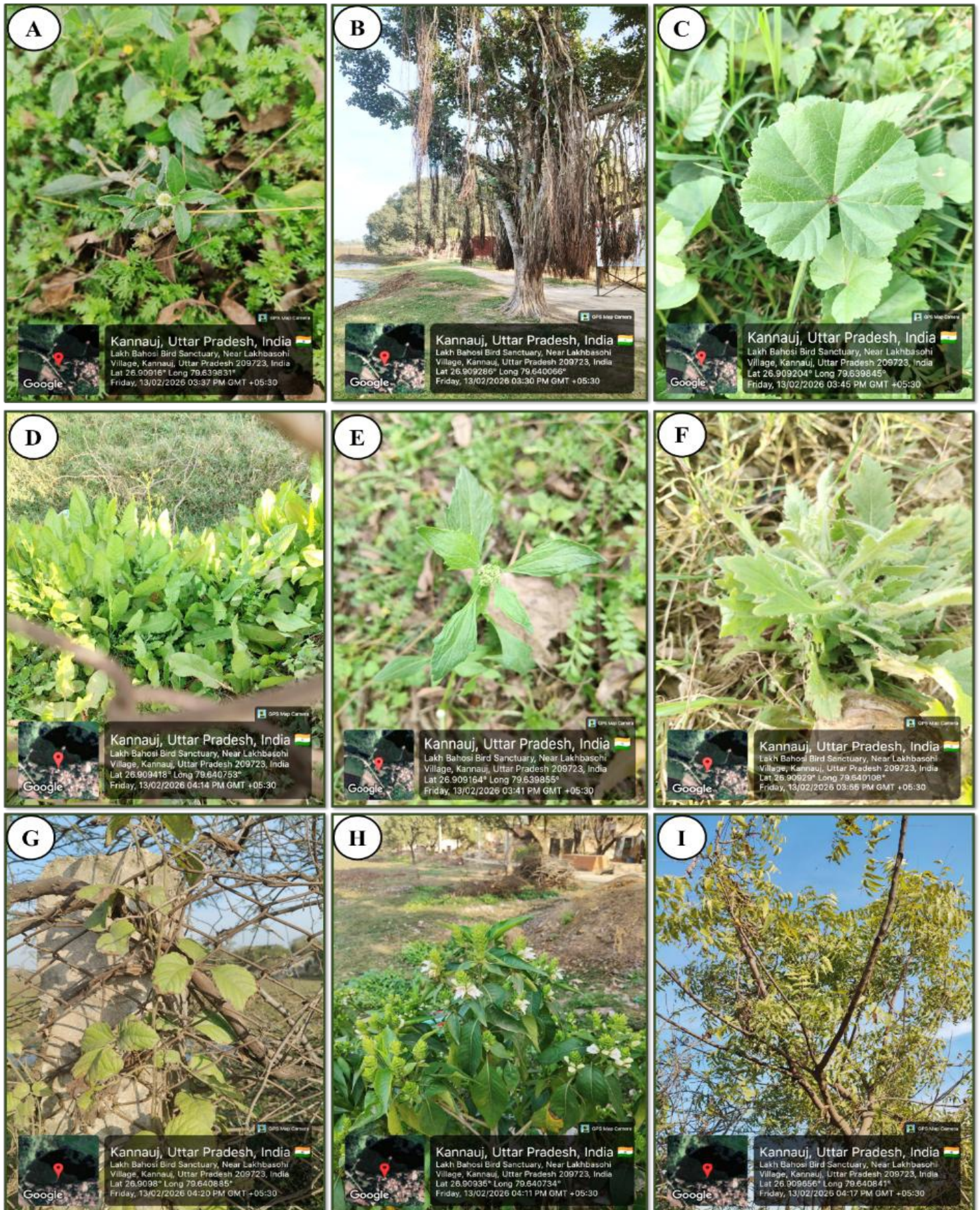


Plate 1: A- *Eclipta alba*, B- *Ficus bengalensis*, C- *Malva parviflora*, D- *Rumex dentatus*, E- *Chenopodium murale*, F- *Laggera crispata*, G- *Causonia strifolia*, H- *Justicia adhatoda*, I- *Azadirachta indica*

Table 1: Showing details of medicinal plants of Lakh-Bahosi area

S. No.	Botanical Name	Local Name	Family	Plant Parts Used	Ethnomedicinal Use
1	<i>Cannabis sativa</i> L.	Hemp/ Bhang	Cannabaceae	Leaves, resin	Analgesic, anti-inflammatory, sedative
2	<i>Alstonia scholaris</i> (L.) R.Br.	Devil Tree/ Saptaparni	Apocynaceae	Bark	Antimalarial, respiratory disorders
3	<i>Lepidium Sativum</i> L.	Garden Cress/ Chandrashoor	Brassicaceae	Whole plant	Diuretic, cough, fever
4	<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	Seeds, bark	Antidiabetic
5	<i>Justicia adhatoda</i> L.	Malabar Nut/ Vasaka	Acanthaceae	Leaves	Expectorant, asthma
6	<i>Lysimachia foemina</i> (Mill.) U. Manns &Anderb.	Blue Pimpernel	Primulaceae	Whole plant	Skin infections
7	<i>Alternanthera sessilis</i> (L.) R.Br.ex DC.	Sessile Joyweed	Amaranthaceae	Leaves	Anti-inflammatory
8	<i>Trachyspermum ammi</i> (L.) Sprague	Ajwain	Apiaceae	Seeds	Digestive
9	<i>Salvia apiana</i> Jeps.	White Sage	Lamiaceae	Leaves	Antimicrobial
10	<i>Lantana camara</i> .	Wild Sage/ Lantana	Verbenaceae	Leaves	Wound healing
11	<i>Sida acuta</i> Burm.f.	Wireweed	Malvaceae	Leaves	Anti-inflammatory
12	<i>Vachellia nilotica</i> (L.) P.J.H. Hurter & Mabb.	Babul	Fabaceae	Bark	Astringent
13	<i>Trachycarpus fortunei</i> (Hook.) H.Wendl.	Windmill Palm	Arecaceae	Leaves	Bleeding control
14	<i>Xanthium strumarium</i> L.	Cocklebur	Asteraceae	Fruit	Sinusitis
15	<i>Ziziphus mauritiana</i> Lam.	Indian Jujube	Rhamnaceae	Leaves	Digestive
16	<i>Senna spectabilis</i> (DC.) H.S.Irwin&Barneby	Golden Wonder Tree	Fabaceae	Leaves	Laxative
17	<i>Ludwigia adscendens</i> (L.) H.Hara	Water Primrose	Onagraceae	Whole plant	Urinary issues
18	<i>Solanum tuberosum</i> L.	Potato	Solanaceae	Tuber	Burn relief
19	<i>Azadirachta indica</i> A. Juss.	Neem	Meliaceae	Leaves	Antimicrobial
20	<i>Cucurbita maxima</i> Duchesne	Pumpkin	Cucurbitaceae	Seeds	Vermifuge
21	<i>Sphaeranthus indicus</i> L.	East Indian Globe Thistle	Asteraceae	Flowers	Nervine tonic
22	<i>Anethum graveolens</i> L.	Dill	Apiaceae	Seeds	Digestive
23	<i>Ranunculus sceleratus</i> L.	Cursed Buttercup	Ranunculaceae	Whole plant	Pain relief
24	<i>Euphorbia prostrata</i> Aiton	Prostrate Spurge	Euphorbiaceae	Leaves	Piles
25	<i>Solanum nigrum</i> L.	Black Nightshade	Solanaceae	Whole plant	Liver tonic
26	<i>Psidium guajava</i> L.	Guava	Myrtaceae	Leaves	Antidiarrheal
27	<i>Malva parviflora</i> L.	Cheeseweed	Malvaceae	Leaves	Demulcent
28	<i>Rapistrum rugosum</i> (L.) All.	Turnip Weed	Brassicaceae	Leaves	Anti-inflammatory
29	<i>Rumex dentatus</i> L.	Toothed Dock	Polygonaceae	Root	Laxative
30	<i>Ficus benghalensis</i> L.	Banyan	Moraceae	Latex	Diabetes
31	<i>Cayratia trifolia</i> (L.) Domin	Bush Grape	Vitaceae	Leaves	Anti-inflammatory
32	<i>Bambusa vulgaris</i> Schrad. ex J.C.Wendl.	Common Bamboo	Poaceae	Shoots	Urinary issues
33	<i>Chenopodium album</i> L.	Bathua	Amaranthaceae	Leaves	Anemia
34	<i>Musa paradisiaca</i> L.	Banana	Musaceae	Fruit	Constipation
35	<i>Carica papaya</i> L.	Papaya	Caricaceae	Leaves	Dengue support
36	<i>Ricinus communis</i> L.	Castor	Euphorbiaceae	Seeds	Purgative
37	<i>Eclipta prostrata</i> (L.) L.	False Daisy	Asteraceae	Whole plant	Liver tonic
38	<i>Launaea procumbens</i> (Roxb.) Ramayya & Rajagopal	Creeping Launaea	Asteraceae	Leaves	Anti-inflammatory
39	<i>Oxalis corniculata</i> L.	Creeping Woodsorrel	Oxalidaceae	Leaves	Fever
40	<i>Senegalia catechu</i> (L.f.) P.J.H. Hurter & Mabb.	Khair	Fabaceae	Bark	Skin disease
41	<i>Phoenix sylvestris</i> (L.) Roxb.	Wild Date Palm	Arecaceae	Fruit	Anemia
42	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn.	Jharber	Rhamnaceae	Leaves	Indigestion
43	<i>Calotropis gigantea</i> (L.) Dryand.	Crown Flower/ Aak	Apocynaceae	Leaves	Arthritis
44	<i>Prosopis juliflora</i> (Sw.) DC.	Mesquite	Fabaceae	Pods	Fodder
45	<i>Terminalia chebula</i> Retz.	Haritaki	Combretaceae	Fruit	Digestive
46	<i>Oroxylum indicum</i> (L.) Kurz	Indian Trumpet Tree	Bignoniaceae	Root	Jaundice
47	<i>Albizia lebeck</i> (L.) Benth.	Siris Tree	Fabaceae	Leaves	Cough
48	<i>Bauhinia racemosa</i> Lam.	Bidi Leaf Tree	Fabaceae	Leaves	Dysentery
49	<i>Cassia fistula</i> L.	Golden Shower Tree	Fabaceae	Fruit	Laxative
50	<i>Phyllanthus emblica</i> L.	Indian Gooseberry	Phyllanthaceae	Fruit	Immunity
51	<i>Pterocarpus marsupium</i> Roxb.	Indian Kino	Fabaceae	Bark	Diabetes
52	<i>Centella asiatica</i> (L.) Urb.	Gotu Kola	Apiaceae	Leaves	Brain tonic
53	<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson	Giloy	Menispermaceae	Stem	Immunity
54	<i>Desmodium triflorum</i> (L.) DC.	Three Flower Beggarweed	Fabaceae	Leaves	Soil binder
55	<i>Pontederia crassipes</i> Mart.	Water Hyacinth	Pontederiaceae	Whole plant	Antiinflammatory
56	<i>Eucalyptus globulus</i> Labill.	Blue Gum	Myrtaceae	Leaves	Oil source
57	<i>Argemone mexicana</i> L.	Mexican poppy	Papaveraceae	Seeds, Roots	skin diseases and wounds.
58	<i>Datura stramonium</i> L.	Jimson weed	Solanaceae	Leaves, Seeds	respiratory issues like asthma.
59	<i>Senna occidentalis</i> (L.) Link	Coffeeweed	Fabaceae	Roots, Leaves	skin ailments
60	<i>Calotropis gigantea</i> (L.) Dryand.	Giant milkweed	Apocynaceae	Leaves, Flowers	relieve pain/swelling.

However, the increasing pressure on natural vegetation due to urbanisation and overexploitation may threaten these valuable plant resources. Thus, there is an urgent need to conserve medicinal plant diversity and comprehensively document traditional knowledge systems before they are lost due to environmental and socio-cultural changes. In conclusion, ethnobotanical studies like this serve as a bridge between traditional wisdom and modern science, promoting sustainable use of biodiversity while contributing to healthcare and conservation efforts.

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