



RESEARCH ARTICLE

Aquatic and Marshy Plant Species of Salona Tal of Azamgarh, Uttar Pradesh

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Manuscript Details

Manuscript Submitted : 11/09/2025

Manuscript Revised : 23/10/2025

Manuscript Accepted : 25/10/2025

Manuscript Published : 15/11/2025

Available On

<https://plantaescientia.com/ojs>

Cite This Article As

Yadav Rupendra Kumar, Bhimsen, Verma Ankita, Anand Swapnil, Mani Ruchi, Samuel C.O., Chauhan Rajveer Singh & Gond Deepak Kumar. (2025). Aquatic and Marshy Plant Species of Salona Tal of Azamgarh, Uttar Pradesh. *Pla. Sci.* 2025; Vol. 08 Iss. 4:47-54

DOI-

<https://doi.org/10.32439/ps.v8i4.47-54>

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ABSTRACT

The present study documents the floristic composition of Salona Tal, a wetland ecosystem in Azamgarh district, Uttar Pradesh, through extensive field surveys conducted during 2023-2024. A total of 111 plant species were recorded, encompassing 91 genera and 43 families. The identified species represents a diverse array of aquatic and marshy plants including *Ageratum conyzoides*, *Alternanthera sessilis*, *Coldenia procumbens*, *Commelina benghalensis*, *Cyperus rotundus*, *Dentella repens*, *Eclipta prostrata*, *Pontederia crassipes*, *Ipomoea aquatica*, *Ludwigia adscendens*, *Ludwigia octovalvis*, *Marsilea minuta*, *Nymphoides indica* etc. The diversity and ecological significance of these species underscore the vital role of *Salona Tal* in sustaining local biodiversity. This floristic inventory not only enhances our understanding of wetland ecosystems in eastern Uttar Pradesh but also contributes essential baseline data for future conservation and management efforts aimed at protecting wetland biodiversity

Keywords: Aquatic species, Azamgarh, Marshy plant species; Salona Tal; Uttar Pradesh.

INTRODUCTION

Salona Tal is a rural wetland region located in the eastern part of Uttar Pradesh, India. Geographically, it is bordered by Mau district to the east, Ambedkar Nagar to the west, Gorakhpur to the north, and Jaunpur to the south. Situated within the expansive topographical landscape of the Azamgarh district, Salona Tal exhibits diverse environmental conditions that support a rich variety of wetland ecosystems. Wetlands refer to a range of water-saturated habitats such as marshes, swamps, bogs, fens, seasonal ponds, riverbanks, and paddy fields. These areas are often found at or near the surface of water and significantly influence terrestrial land use (Bhimsen *et.al.*, 2024). They serve as transitional zones between permanently flooded and seasonally wet areas, characterized by hydromorphic soils and hydrophytic vegetation. Wetland plants typically grow in oxygen-deficient (anaerobic) conditions caused by high water content, and they play a crucial role in supporting native wildlife by serving as food sources and habitat.

The aquatic and marshy plant species in such areas often possess small root systems and specialized adaptations for waterlogged conditions. These plants are fundamental to ecological balance, enhancing ecosystem productivity and contributing to the overall health of aquatic environments. Globally, the ecological value of aquatic and marshy plant diversity is well recognized for sustaining life-supporting systems. However, in India, these valuable resources remain under-utilized and have not received adequate attention in terms of systematic scientific studies. Aquatic and marshy plants exhibit a wide range of growth habits and morphological plasticity, which pose significant taxonomic challenges. Compared to terrestrial flora, these plants often show structural adaptations that reflect their evolutionary response to aquatic habitats (Mishra *et.al.*, 2014).

India, with its vast landmass and geographic diversity, hosts significant aquatic and marshy vegetation. Early documentation includes the work of Biswas and Calder (2014), Subramanyam (1962), Deb (1976) and Cook (1996), who contributed comprehensive records of India's hydrophytic flora. Additional studies have been carried out on specific plant groups by Subramanyam & Balakrishnan (1962), and Subramanyam & Abraham (1967). In Uttar Pradesh, wetland vegetation has been described by researchers such as Sen (1959-1960), Sahai *et al.* (1968), Srivastava *et al.* (1990), and Saini (2017). Work on wetland floral diversity specifically in parts of eastern Uttar Pradesh has also been done by various workers (Kumar *et.al.*, 2014 and Mishra *et.al.*, 2013). The present study of Salona Tal in Azamgarh District provides a preliminary floristic account

of the wetland vegetation, documenting the diversity and ecological significance of aquatic and marshy plant species in the region.

MATERIALS AND METHODS

Study Area

The part of eastern Uttar Pradesh has been considered as a structural entity on the basis of topography, climate, soil, geography and socio-cultural profile. It is one of the richest and most interesting regions of wetland diversity. The districts of Mau to the east, Sultanpur to the west, Gorakhpur to the north, and Jaunpur to the south encircle the study area of the Azamgarh district. The specific coordinates of the study site, Salona Tal, are approximately 26°17'8062" N latitude and 83°36'6996" E longitude (Fig. 1). The present study is based on the exploration and study of aquatic and marshy plants of Salona Tal and was conducted over an 18-month period, from the first week of June 2023 (pre-monsoon season) to the last week of November 2024 (post-monsoon season).

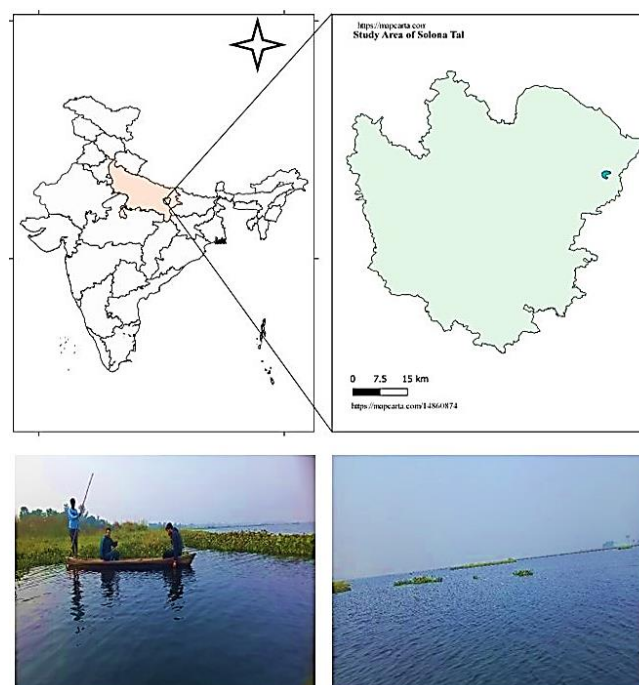


Fig. 1. Map of Salona tal, Azamgarh

Plant Collection

Field surveys were carried out periodically over the study period to explore and collect aquatic and marshy vegetation from different microhabitats within the wetland. Field

tools used during sample collection included a digger, secateurs, cord, polybags, notebook, pH meter, hand lens, DSLR camera (Canon EOS REBEL T7), and a mobile-based GPS navigator. Photographs of each species were taken in their habitat. For each identified species, 3–5 specimens were collected from various aquatic and marshy zones and temporarily stored in newspaper folds. Key observational data such as growth habit, habitat type, and flowering/fruitlet periods were recorded in the field notebook. The nomenclature of each taxon, such as the current accepted name and synonym has been traced with the using Plants of the World Online (POWO).

Preservation

Collected plant specimens are pressed between blotting papers. These papers were changed every alternate day to ensure proper drying. Once fully dried, the specimens are treated in a solution of ethanol and mercuric chloride before being mounted. The dried specimen was mounted on standard-sized (28 x 41 cm) handmade herbarium sheets using synthetic adhesive. Each specimen was accompanied by a label including details such as field number, date of collection, collector's name, scientific name, family, vernacular name, and ethnobotanical uses.

Identification

Species identification was performed using Flora of Uttar Pradesh: Vol. 1-3 (2016, 2020 & 2024) along with regional floras such as Flora of Allahabad (1992), and Flora Gorakhpurensis (1976). Specimens were matched with taxonomic keys and descriptions, and cross-referenced with authenticated herbarium samples and published illustrations to ensure accuracy. Additional literature was consulted from the library of the Department of Botany, CMP Degree College, Prayagraj. All collected specimens have been preserved and deposited in the herbarium of the same department for future reference.

RESULTS AND DISCUSSION

The current study is based on the extensive analysis of aquatic and marshy plant species of Salona Tal, Azamgarh. The wetlands which have been covered in our survey include vegetation typically grows in stagnant water that remains at or above the soil surface. Field investigations conducted from June 2023 to November 2024 revealed a remarkable diversity of aquatic and swampy plant species, with species richness notably higher during the summer months. A total of 111 plant species were recorded, representing 91 genera (Table 1) and 43 families (Fig. 2). Of these, 77 species were dicotyledons, 30 species were monocotyledons, 3 species were pteridophytes, and 1

species was a bryophyte (Fig. 3). Among the plant families, Asteraceae emerged as the most dominant with 18 species, followed by Cyperaceae (8 species), Amaranthaceae (7 species), Poaceae (7 species), Malvaceae (5 species), and Apiaceae (5 species). Other families included Polygonaceae, Solanaceae – 4 species each. Fabaceae, Rubiaceae, Hydrocharitaceae, Potamogetonaceae – 3 species each. Brassicaceae, Verbenaceae, Onagraceae, Euphorbiaceae, Plantaginaceae, Lamiaceae, Araceae, Salviniaceae – 2 species each. Primulaceae, Aponogetonaceae, Papaveraceae, Basellaceae, Cannaceae, Cannabaceae, Ceratophyllaceae, Commelinaceae, Pontederiaceae, Boraginaceae, Eriocaulaceae, Acanthaceae, Convolvulaceae, Marsileaceae, Mazaceae, Nelumbonaceae, Nymphaeaceae, Menyanthaceae, Oxalidaceae, Ranunculaceae, Alismataceae, Typhaceae, Lentibulariaceae – 1 species each (Fig. 4).

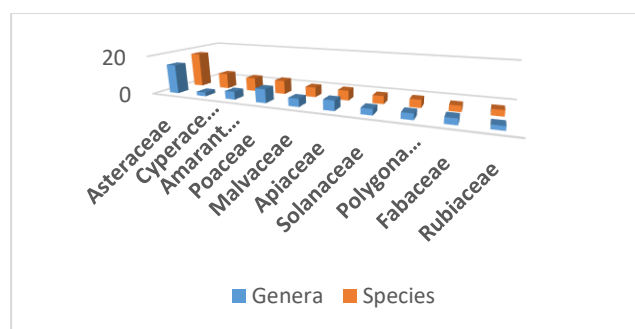


Fig.2- Dominant Families of Salona Tal, Azamgarh

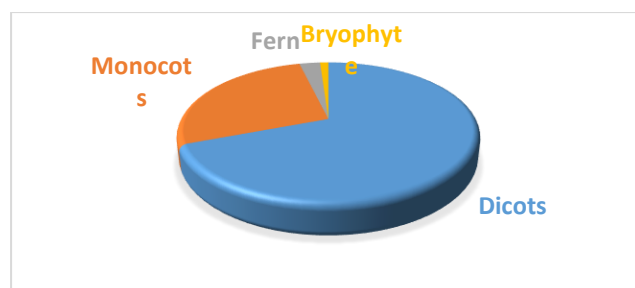


Fig.3- Diversity in life forms of Salona Tal, Azamgarh

CONCLUSION

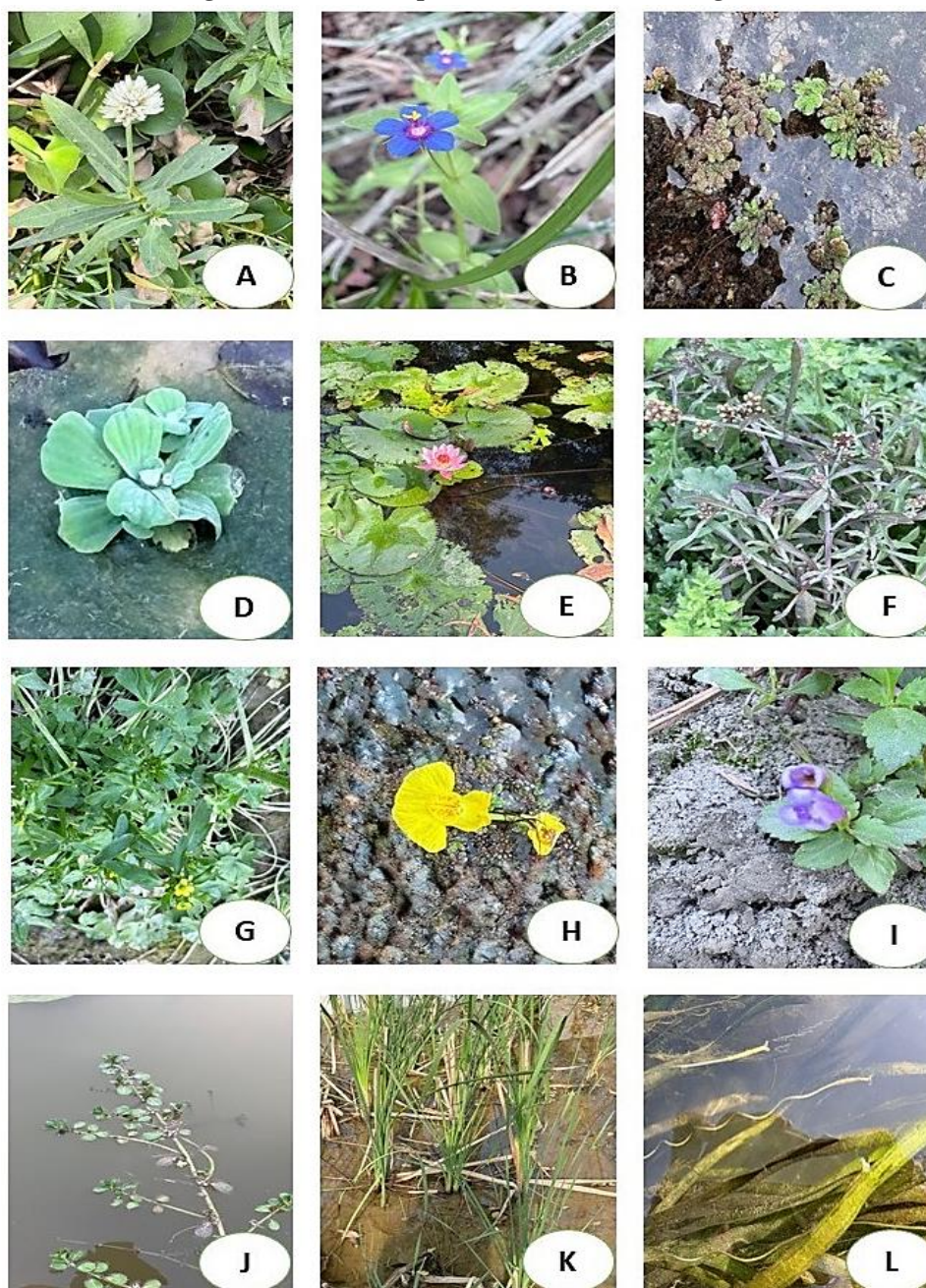
The present study provides a comprehensive account of the aquatic and swampy plant diversity in the Salona Tal wetland of Azamgarh, highlighting its rich floristic composition. A total of 111 plant species across 43 families were documented, with dicots forming the majority. This distribution highlights the ecological complexity and diversity within the Salona Tal wetland ecosystem, affirming its role as a hotspot for wetland flora in eastern Uttar Pradesh. Seasonal variations during the summer months revealed a notable increase in species richness, emphasizing the ecological significance of the wetland.

These findings underscore the importance of conserving such habitats, which not only support high biodiversity but also play a crucial role in maintaining ecological balance in the region.

ACKNOWLEDGMENTS

The authors express deep gratitude to the Principal, C.M.P. Degree College, Prayagraj and Principal, St. Andrew's College, Gorakhpur, Uttar Pradesh for providing the necessary facilities and support to carry out the present research work.

Fig.4- Some selected plants of Salona Tal, Azamgarh



A. *Alternanthera philoxeroides* (Mart.) Griseb, B. *Amaranthus viridis* L., C. *Azolla pinnata* R.Br., D. *Pistia stratiotes* L., E. *Nymphaea nouchali* Burm.f., F. *Gnaphalium uliginosum* L., G. *Ranunculus sceleratus* L., H. *Utricularia aurea* Lour., I. *Mazus pumilus* (Burm.f.) Streenis, J. *Ludwigia adscendens* (L.) H. Hara, K. *Typha latifolia* L., L. *Vallisneria spiralis* L.

Table.1- Aquatic and marshy plants of Salona Tal, Azamgarh

Sr. No.	Botanical Name	Family	Common Name/ Vernacular Name	Habit
1.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Latjeera	EH
2.	<i>Acmella uliginosa</i> (Sw.) Cass.	Asteraceae	Akarkar	DH
3.	<i>Ageratum conyzoides</i> L.	Asteraceae	Jungli pudina	BH
4.	<i>Ageratum houstonianum</i> Mill.	Asteraceae	Sota ka Ful	BH
5.	<i>Alternanthera sessilis</i> (L.) DC.	Amaranthaceae	Kanchari	PH
6.	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Alligator weed	SH
7.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Kanta chaulai	SPH
8.	<i>Amaranthus viridis</i> L.	Amaranthaceae	Jungle chaulai	PH
9.	<i>Lysimachia arvensis</i> (L.) U.Manns & Anderb.	Primulaceae	Krishna neel	PH
10.	<i>Aponogeton crispus</i> Thunb.	Aponogetaceae	Water hyssop	EH
11.	<i>Argemone mexicana</i> L.	Papaveraceae	Mexicon poppy	PH
12.	<i>Avena sativa</i> L.	Poaceae	Oat	UH
13.	<i>Azolla pinnata</i> R.Br.	Salviniaceae	Mosquito fern	FF
14.	<i>Basella alba</i> L.	Basellaceae	Poi	TH
15.	<i>Berula erecta</i> (Huds.) Coville	Apiaceae	Lesser water parsnip	AH
16.	<i>Blumea lacera</i> (Burm.f.) DC.	Asteraceae	Kukrondha	EH
17.	<i>Blumea lanceolaria</i> (Roxb.) Druce	Asteraceae	Sembung	ES
18.	<i>Brassica rapa</i> L.	Brassicaceae	Mustard	EH
19.	<i>Caesulia axillaris</i> Roxb.	Asteraceae	Pink node flower	DH
20.	<i>Bromus inermis</i> Leyss.	Poaceae	Smooth brome	SFH
21.	<i>Canna indica</i> L.	Cannaceae	Indian shot	US
22.	<i>Cannabis sativa</i> L.	Cannabaceae	Bhang	AS
23.	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Brahmi	CH
24.	<i>Ceratophyllum submersum</i> L.	Ceratophyllaceae	Soft hornwort	SH
25.	<i>Chenopodium album</i> L.	Amaranthaceae	Bathua	EH
26.	<i>Chenopodium murale</i> (L.) S. Fuentes, Uotila & Borsch	Amaranthaceae	Nettle-leaved goosefoot	EH
27.	<i>Commelina benghalensis</i> L.	Commelinaceae	Kana, kankawa, Buchna	SH
28.	<i>Corchorus capsularis</i> L.	Malvaceae	Tossa jute	EBH
29.	<i>Coriandrum sativum</i> L.	Apiaceae	Dhaniya	CFH
30.	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae	Ban tulsi	SH
31.	<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Fabaceae	Guar	EH
32.	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Doob	PH
33.	<i>Cyperus alulatus</i> J.Kern	Cyperaceae	Rice sedge	GH
34.	<i>Cyperus brevifolius</i> (Rottb.) Hassk.	Cyperaceae	Dwarf umbrella grass	EH
35.	<i>Cyperus corymbosus</i> Rottb.	Cyperaceae	Soft grass	EH
36.	<i>Cyperus difformis</i> L.	Cyperaceae	Flatsedge	EH
37.	<i>Cyperus iria</i> L.	Cyperaceae	Nirvishi	NH
38.	<i>Cyperus nutans</i> var. <i>eleusinoides</i> (Kunth) Haines	Cyperaceae	Latesedge	CH
39.	<i>Cyperus rotundus</i> L.	Cyperaceae	Motha	CH

40.	<i>Dentella repens</i> (L.) J.R. Forst. & G. Forst.	Rubiaceae	Bhuiyat	PH
41.	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	Poaceae	Sawa grass	ETH
42.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Bhringraj	PH
43.	<i>Pontederia crassipes</i> Mart.	Pontederiaceae	Jhalkumbhi	FF
44.	<i>Elymus repens</i> (L.) Gould	Poaceae	Couch grass	CH
45.	<i>Eriocaulon cinereum</i> R.Br.	Eriocaulaceae	Piperwort	PH
46.	<i>Erigeron canadensis</i> L.	Asteraceae	Horse weed	EH
47.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Dudhi	PH
48.	<i>Gnaphalium uliginosum</i> L.	Asteraceae	Cotton weed	EH
49.	<i>Grangea maderaspatana</i> (L.) Desf.	Asteraceae	Mukhtari, Mustaru	AH
50.	<i>Heliotropium indicum</i> L.	Boraginaceae	Hathi shud	EH
51.	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Sewar	SH
52.	<i>Hygrophila</i> spp.	Acanthaceae	Kokilaksha	EH
53.	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	Kalmi sag	FH
54.	<i>Lathyrus sativus</i> L.	Fabaceae	Latari, khesari	CH
55.	<i>Launaea procumbens</i> (Roxb.) Ramayya & Rajagopal	Asteraceae	Jangi gobi	PH
56.	<i>Lemna minor</i> L.	Araceae	Duckweed	FF
57.	<i>Lippia alba</i> (Mill.) N.E.Br. ex Britton & P. Wilson	Verbenaceae	Bushy matgrass	MS
58.	<i>Ludwigia adscendens</i> (L.) H.Hara	Onagraceae	Pokal Panlawang, Water Primrose	FH
59.	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Onagraceae	Banlong	RBS
60.	<i>Marsilea minuta</i> L.	Marsileaceae	Water clover	SH
61.	<i>Mazus pumilus</i> (Burm.f.) Streenis	Mazaceae	Maalti jhar	TH
62.	<i>Mecardonia procumbens</i> (Mill.) Small	Plantaginaceae	Baby jump-up	CH
63.	<i>Melochia corchorifolia</i> L.	Malvaceae	Thulak, Bundava, Chitrabeez	EH
64.	<i>Najas graminea</i> Delile	Hydrocharitaceae	Kholali	SH
65.	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Lotus	EH
66.	<i>Nicotiana glauca</i> Viv.	Solanaceae	Tobacco plant	VH
67.	<i>Nymphaea nouchali</i> Burm.f.	Nymphaeaceae	Water lily	FH
68.	<i>Nymphoides indica</i> (L.) Kuntz.	Menyanthaceae	Chandmala	FH
69.	<i>Oenanthe javanica</i> (Blume) DC.	Apiaceae	Pennywort	CH
70.	<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Pitpapara	PH
71.	<i>Oldenlandia pumila</i> (L.f.) DC.	Rubiaceae	Dwarf diamond flower	PH
72.	<i>Oryza sativa</i> L.	Poaceae	Paddy	EH
73.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Yellow woodsorrel	PH
74.	<i>Parthenium hysterophorus</i> L.	Asteraceae	Ghazar ghas	ES
75.	<i>Persicaria glabra</i> (Willd.) M. Gomez	Polygonaceae	Pani-mirch	TH
76.	<i>Persicaria maculosa</i> Gray	Polygonaceae	Lady's thumb	TH
77.	<i>Phylla nodiflora</i> (L.) Greene	Verbenaceae	Jalbuti, jal pippali	PH
78.	<i>Physalis pruinosa</i> L.	Solanaceae	Rasbhari	SH
79.	<i>Pistia stratiotes</i> L.	Araceae	Water lettuce	FH

80.	<i>Polygonum aviculare</i> L.	Polygonaceae	Birdweed, Doorweed, Knotgrass	PH
81.	<i>Potamogeton crispus</i> L.	Potamogetonaceae	Curly-leaf pondweed	SH
82.	<i>Potamogeton natans</i> L.	Potamogetonaceae	Floating pondweed	SH
83.	<i>Potamogeton nodosus</i> Poir.	Potamogetonaceae	Longleaf pondweed	SH
84.	<i>Psammogeton diffusus</i> (Roxb. Ex Sm.) Rech.f. ex Pimenov	Apiaceae	Indian celery	SPH
85.	<i>Pseudognaphalium luteoalbum</i> (L.) Hilliard & B.L.Burt	Asteraceae	Gersey cudweed	EH
86.	<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Jal-dhaniya	EH
87.	<i>Rorippa indica</i> (L.) Hiern	Brassicaceae	Indian field cress	EH
88.	<i>Rumex dentatus</i> L.	Polygonaceae	Banpalak	EH
89.	<i>Sagittaria sagittifolia</i> L.	Alismataceae	Katniss	SH
90.	<i>Salvia sylvestris</i> L.	Lamiaceae	Sage	UH
91.	<i>Salvia verbenaca</i> L.	Lamiaceae	Wild clary	EH
92.	<i>Salvinia natans</i> (L.) All.	Salviniaceae	Floating fern	FF
93.	<i>Schoenoplectus tabernaemontani</i> (C.C.Gmel.) Palla	Cyperaceae	Bulrush	EH
94.	<i>Setaria parviflora</i> (Poir.) Kerguelen	Poaceae	Mission grass	EH
95.	<i>Sida acuta</i> Burm.f.	Malvaceae	Baraira	EH
96.	<i>Sida cordifolia</i> L.	Malvaceae	Flannel weed	EH
97.	<i>Solanum nigrum</i> L.	Solanaceae	Makoy	EH
98.	<i>Solanum virginianum</i> L.	Solanaceae	Kantakari	ES
99.	<i>Soliva anthemifolia</i> (Juss.) Sweet	Asteraceae	Button burweed	PH
100.	<i>Soliva sessilis</i> Ruiz & Pav.	Asteraceae	Bindi weed	PH
101.	<i>Sonchus arvensis</i> L.	Asteraceae	Gutweed	EH
102.	<i>Spirodela polyrrhiza</i> (L.) Schleid.	Araceae	Duckmeat	FF
103.	<i>Tridax procumbens</i> L.	Asteraceae	Coat button	EH
104.	<i>Trifolium alexandrinum</i> L.	Fabaceae	Barshim	EH
105.	<i>Typha latifolia</i> L.	Typhaceae	Great reedmace	EH
106.	<i>Urena lobata</i> L.	Malvaceae	Bachita	ES
107.	<i>Utricularia aurea</i> Lour.	Lentibulariaceae	Bladderwort	FH
108.	<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Tapegrass	SH
109.	<i>Veronica anagallis-aquatica</i> L.	Plantaginaceae	Water speedwell	CH
110.	<i>Wolffia globosa</i> (Roxb.) Hartog & Plas	Araceae	Duckweed	FF
111.	<i>Xanthium strumarium</i> L.	Asteraceae	Chhota dhatura, Chhota Gokhuru	EH

Abbreviations EH=Erect Herb, DH=Decumbent Herb, BH=Branching Herb, PH=Prostrate Herb, SH=Sprawling Herb, SPH=Slightly Prostrate Herb, EH=Emergent Herb, UH=Upright Herb, FF=Free-floating Herb, TH=Twining Herb, AH= Ascending Herb, ES=Erect Herb, SFH=Sod-Forming Herb, US=Upright Shrubs, SH=Submerged Herb, FH=Floating Herb, VH=Viscid-pubescent Herb, CH=Creeping Herb, AH=Annual Herb, RWS=Robust Well-branched Shrubs.

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