

SOME AQUATIC AND MARSHY PLANTS OF AURAIYA AND ETAWAH DISTRICTS (U.P.) INDIA

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Auraiya and Etawah districts of Kanpur division (U.P.) India are a rich source of natural water system like rivers, tributaries, lakes, pond and irrigation canals. The districts have more than 140 aquatic and marshy plants explored during the research. The systematic description of these plants is given with family of each taxon.

Keywords: Aquatic and Marshy plants; Flora of Auraiya and Etawah.

Introduction

The districts Auraiya and Etawah, which form the south-west parts of the division Kanpur of U.P. India, lies in parallel between 26°21' and 27°01' N latitude and between 78°45' and 79°45' E longitude. Both the districts are spread over an area about 4486 sq.kms. The elevation of districts varies between 146.3 m and 147.3 m above the sea level. The river system of the districts belong to main system of Yamuna and Chambel. The other perennial rivers Sirsa, Kwari, Pura, Ahnaiya and Arind. Innumerable lakes, ponds and nullah further serve as natural resources. Besides the river and lakes a network of canal belonging to the lower and upper Gangetic system and numerous tubewells also enrich the water resources of the districts.

Chauhan¹ has collected 560 species and 102 families from the districts. More than 140 aquatic and marshy species were found after the investigation. In this communication only 21 species are systematically described. The collected plants were identified with publish flora of Dutheil². The plants are enumerated alphabetically along with family, description, locality and field number of each taxon. The specimens are deposited in the Department of Botany, Janta Mahavidyalaya, Auraiya, U.P. India for future consultation.

Systematic Description

1. *Alternanthera pungens*: - Knuth in H.B.K., Nov. Gen. 2: 206, 1817, Raizada, Indian Forester 76: 495, 1950 Supple. FUGP. 233 Townsend in Fl. W. Pak. 71: 39, 1974 and in Rev. Handb. Fl. Ceylon 1: 47, 1980, (Amaranthaceae)

A prostrate, patch forming herb. Stem zig-zag, slightly suffused with pink, covered with shaggy hairs. Leaves up to 4 cm long; obovate, oblong on orbicular, apiculate, and cuneate below into a short petiole. Head much compressed and chaffy. Tepals scarious. Bract lanceolate; bracteoles narrow and shorter. Utricle broadly

ovate, truncate or retuse.

Tropics: Frequent- in moist or shady places in gerdens; along canals, ponds and ditches.

Fl. & Fr.: August- December

Chakarnagar: 922.

2. *Centella asiatica* L., FBI.2: 669 : FUGP.1:391.

Hydrocotyle asiatica L., Sp. 234, 1753.Rev. Handb. Fl.

Ceylon 3 : 484, 81 Vern.: *Brahami* (Apiaceae).

Creeping herb, rooting at the nodes. Leaves several at each node, fan- shaped or reniform on long petioles, 5-10x10-20mm. Flowers small, pink in clusters of umbels. Fruit 2-seeded, indehiscent, laterally compressed. Seeds brown, dull, oblong.

Pantropic: Common - along the irrigation channels, forming a mat like ground cover .

Fl. & Fr.: July-October

Bharthana: 898.

3. *Ceratophyllum demersum*: L, Sp.Pl. 992, 1753; FBI.5: 639; FUGP. 3: 168; Van Steenis in Fl. Males, Ser. 1.4 :41, 1949; Aziz in Fl. W. Pak. 70 :1, 1974. Vern.: *Sivara* (Ceratophyllaceae).

A copiously branched, submerged, slender, aquatic herb. Leaves in whorls of 6-10, 1-4 palmatipartite, segments minutely toothed, filiform. Flowers solitary, axillary, sessile. Male flowers: perianth segments 10-15, slightly connate at base, each tipped with a pinkish hair; stamens: 10-20, filaments short, anthers oblong. Female flowers: ovary sessile nutlet ovoid or ellipsoid, coriaceous with persistent subulate style, subtended by a short basal spine on either side.

Cosmopolitans on Temperate and Tropics. Common- in stagnant water of ponds and ditches.

Fl. & Fr. July-December.

Etawah: 1022, Jaitpur; 621.

4. *Cyperus exaltatus*: Retz; Obs. Bot. 5: 11, 1789; FBI. 6:

617; FUGP. 3: 331; Kern in Fl. Males. Ser. 1. 7: 602, 1974; Koyama in Rev. Handb. Fl. Ceylon 5: 173, 1985. Vern: *Nagrmotha* (Cyperaceae).

Stems robust smooth, 3-gonous, up to 1.5 m tall. Leaves variable in length, often overtopped by longest bracts. Spikes 5.0x1.4 cm on rays of variable length; Spikelets pale, 8.0 x 1.6 mm, yellow to brown; rachilla narrowly winged. Glumes ovate-oblong, mucronate, 1.6 mm x 1.4 mm. Stamens-3. Nut tapering at ends, 0.75 x 0.50 mm, yellow or yellow-brown.

Paleotropic and subtropic: Occasional- along canal and river banks; in water logged places; on fields bunds of paddy fields.

Fl. & Fr.: August- December
Bidnoona: 873, Etawah,; 933.

5. *Eichhornia crassipes* (Mart) Solms in DC Monogr. Phan. 4: 527, 1883; Backer in Fl. Males. ser. 1. 4: 259, 1951; Subramanyam, Aquatic Angio, 70, 1961; Suppl. FUGP. 279; Ghazanfar in Fl. W. Pak. 114: 3, 1977. *Pontederia crassipes* Mart; Nov. Gen. et Sp. 1: 9, 1823. Vern; *Jalkumbhi*. (Pontederiaceae).

A fast spreading floating herb, variable in size and form, stem offset, with clumps & purplish, floating roots and leaf rosettes on the nodes. Leaves broadly ovate or rhomboid; subcordate or rounded at base; broadly obtuse at apex, 3-20 cm long and broad, petiole up to 30 cm long swollen, spongy. Spikes 3 - many - flowered pedunculate. Perianth tube greenish, lobes lilac, the posterior with 2 bright-yellow, blue bordered median blotches. Stamens 6, curved; filaments glandular-hairy. Posterior 3 the longer. Capsule linear oblong. Seeds ovoid. *Neotropical* very common in ponds and water collected in ditches, along road sides or railway tracks.

Fl. & Fr.: Greater part of the year.
Etawah: 1252

6. *Hydrilla verticillate* (L.F.) Royle, III. Bot. Himal. Mts, 376, 1873. FBI. 5: 659; FUGP. 3: 173; Hartog in Fl. Males, ser. 1.: 5: 385, 1957; Subramanyam, Aquatic Angios. 55, 1962: Cooks and Luond, Aquatic bot. 13: 485-504. 1982. - *Serpicula verticillata* L.F, Suppl., 416, 1781. (Hydrocharitaceae).

A slender, scarcely rooting, net-forming, submerged, aquatic herb. Leaves thin, oblong or linear, acute, dentate, ciliate, 1-nerved. Flowers minute. Male flowers: pedicel slender, stamens 3, anthers reniform pistillode minute. Female flowers: included in spathe, rostrum present; style 2-3, stigma fimbriate; fruit muciculate, enclosed by persistent perianth; seeds minute, oblong rimmed.

Temperate and tropic of old world; Occasional- in ponds

and deep ditches.

Fl. & Fr.: September- November
Auraiya: 1249.

7. *Hygrophila auriculata* (Schum) Heine, Kew Bull. 16: 172, 1962; - *Barleria auriculata* Schum in Schum. In and Thonn., Beskr. Guin Pl 285, 1827- *Asteracantha lonfifolia* (L) Nees in Wall, Pl. Asiat. Rare. 3; 90, 1832; FUGP. 2: 184; Fl. Sant, Univ. Bombay bot. Mem. 2: 17, 1952; FF PUP. 3. 525. - *Hygrophyla spinosa* T. Anderss. In Thwaites, Enum. Pl. 225, 1860; FBI. 4 : 408 Vern.; *Jalmakhana* (Acanthaceae).

Stem simple or branched, up to 1.5 m high, hairy one younger part. Leaves in spurious whorls of 6 each, lanceolate, hairy, up to 15cm long. Flowers whorls often subtended by sharp, stout, yellow thorns; bracts involucre, sub-2-seriate, hispidly hairy, up to 4 cm long. Posterior calyx segment. Corolla, tube abruptly swollen at the top; lower lip with 2 entire crests like longitudinal folds on the palate. Capsule oblong, glabrous. Seeds 4-6, compressed, hygroscopic hairy.

India, Ceylon. Common- marshes, moist ridges; drying ponds or ditches.

Fl. & Fr.: October- May.
Etawah: 1048.

8. *Ipomoea aquatica*; Forssk; Fl. A Egypt.- Arab. 44, 1775; FBI. 4: 210; oostr. In Fl. Males. Ser. 1. 4: 473, 1953; FF PUP. 3: 485; Austin in Fl. W. Pak 126: 38, 1979 & in Rev. Handb. Fl. Ceylon 1: 318, 1980- *Ipomoea reptans* Poir. in Lam Encycl Suppl. 3: 460, 1814, non *Convolvulus reptans* L. 1753; FUGP. 2: 114. Vern.: *Nari* (Convolvulaceae).

Leaves hastate, a few terminal narrowly 3-angular, or lanceolate. Flowers cymes; peduncle 5-7 cm long; bracts minute. Corolla white-purple, 4-5 cm long. Stamens and style included. Capsule ovoid to globose. Seeds 4, densely grey-pubescent.

Tropics Occasional-near ponds large ditches
Fl. & Fr.: November-April.
Etawah: 437.

9. *Ludwigia adsendens* (L.) Hara, J. Jap. Bot. 28: 291, 1953; Sreem. Bull. Bot. Surv. India 8: 79, 1966; Raven in Fl. Males. Ser. 1. 8: 104, 1977- *Jussiaea repens* L., Sp. Pl. 388, 1753. Non. *Ludwigia repens* Forster 1771; FBI. 2: 587; FUGP. 1: 355; FFPUP. 2: 351. (Onagraceae).

A long spreading herb, attached in mud and floating on water surface with help of nodal clusters of floating roots and conspicuous, white spindle shaped spongy, pneumatophores. Leaves broadly oblong, cuneate at base, hairy along margins. Flowers solitary in the axils of upper leaves. Sepals 5-7, 6-8mm long, deltoid, acuminate. Petals up to depressed, white, hairy nectary,

surrounding the base of epipetalous filaments. Bracteoles present near the base of capsule. Capsule linear-cylindric, 12-27 x 3.4 mm, light brown, with 10 conspicuous, dark brown ribs.

Pantropic. Occasional-in ponds, ditches or running waters with muddy banks.

Fl. & Fr. : February-August.

Etawah, : 1035.

10. *Nelumbo nucifera* Gaertn., Fruct. Sem. Pl. 1 : 73, 1788; Subramanyam, Aquatic Angios. 8, 1962; Backer & Bakh. F. Fl. Jawa 1 : 148, 1963; FFPUP. 2 : 25 - *Nelumbium speciosum* Willd., Sp. Pl. 2 : 1258. 1799; FBI. 1: 116; FUGP. 1 : 35. Vern. : *Kamal. Kunwal*. (Nelumbonaceae).

An aquatic rhizomatous herbs. Leaves peltate, orbiculate, upto 90 cm across, with up turned margins, long-petioled. flowers solitary, long-peduncled, large and showy. Sepals 4-5, caducous. Petals many, elliptic, obtuse, brightly coloured. Stamens many-seriate; anthers appendaged. Carpels surrounded by and embedded in cavities of the broad turbinate spongy torus; stigma peltate. Ripe capsules nut like, smooth, with a bony pericarp. *Indo-malaysia*. Occasional-in Ponds.

Fl. & Fr. : May - August

Gulabpura, : 743.

11. *Lemna perpusilia* Torrey, Fl. N. York. 1: 245, 1843; Hartog & Plas, Blumea 18: 363, 1970; Plas, in Fl. Males. ser. 1: 230, Hepper in Rev. Handb. Fl. Ceylon 2: 398, 1981, - *Lemna paucicostata* Hegelm. Lemnac. 138, 1868, incl. var. *membranacea* Hegelm.; FBI. 6: 556; FUGP. 3: 305; Vern. : Chwipatti (Lemnaceae).

Fronds floating solitary or in groups of 2-5, float on both sides, obovate oblong, 1. 5-2.5x1.0-1.3mm glabrous. Root solitary; sheath slightly winged at base. Inflorescence developing from one of the budding pouches, consisting of 1 female and 2 male flowers, enclosed by a membranous spathe; ovary 1-ovule.

North America. Common- in pond and ditches

Fl. & Fr. : Not observed.

Etawah : 1030.

12. *Nymphaea pubescens* Willd. Sp. Pl. 2: 24. *Nymphaea nouchali* auct. Non Burm. f. 1768; FBI. 1: 114; FUGP. 1: 34; Subramanyam, Aquatic Angios. 6. 1962. Vern. : *Chhota Kamal* (Nymphaeaceae).

Leaf blade green above, brown beneath, up to 36x30cm. Sepals 5-10- ribbed. Filaments broadly dilated at base; another not appendaged. Seed ellipsoid.

Tropics. Occasional in ponds, *Jhils*, also grown in tanks.

FL. & FR. : Major part of the year.

Etawah, : 449.

13. *Polygonum plebeium* R.Br., Prodr. 420, 1810; FBI. 5: 27; FUGP. 3: 31; Khan & Hassan. Bangladesh J. Bot. 7 : 23, 1978. Vern: *Mirchonia* (Polygonaceae)

A prostrate, polymorphic herb, up to 40cm long; root- stock often woody. Leaves linear oblong or rarely obovate, sessile, apiculate. Stipule hyaline, lacerate and fimbriate up to middle. Pedicel jointed just before perianth. Perianth : outer 2 subacute suffused with green outside; inner 3 obtuse dark red. Stamens 8 or fewer by 1-2. Styles 3. nut 3- gonous.

Paleotropics. Common-along ponds & ditches.

Fl. & Fr. : January - May

Shergarh, : 16.

14. *Ranunculus sceleratus* ssp. *sceleratus*; Tutin in Fl. Eur. 1: 233, 1964. - *Ranunculus sceleratus* L., Sp. Pl. 551, 1753; FBI. 1: 19; FUGP 1: 19. Vern: *Jaldhania* (Ranunculaceae).

An erect, succulent herb, up to 70cm tall. Stem fistular, simple, glabrescent below, branched and pubescent above. Leaves 3-5 parately lobed or partite, lower long-petioled, higher ones subsessile or sessile. Flowers yellow, panicked. Sepals reflexed. Petals oblong. Stamens and carpels numerous. Achenes with an intermarginal rib. Receptacle pilose.

North temperate. Common - along river and pond banks; in wet places in gardens.

Fl. & Fr. : February - May.

Shergarh, : 15.

15. *Rumex dentatus* ssp. *Klotzschianus* (Meisn) Reaching. f., Beith. Bot. Centralb. 49: 19. 1932 & Candollea. 12: 57; 1949. - *Rumex Klotzschianus* Meisn. In DC., Pradr. 14: 57, 1856. - *Rumex dentatus* auct. non L. 1771; FBI. 5: 59; FUGP. 3: 41. vern.: *Janglipalak* (Polygonaceae).

An erect, glabrous herb, up to 60 cm tall; young branches sub succulent; stem sulcate, tinged or suffused with red. Leaves oblong-obtuse, rounded or cordate below, glabrous, up to 12 cm long; petiole shorter than blade. Flowers pedicillate; in distant leafy or leafless whorls. Inner perianth segments broadly - ovate, smooth-tuberled outside irregularly toothed or pectinate on margins, teeth straight, not hooked. Stamens 6, filaments short; anthers oblong, nut acutely 3-gonous, ± winged.

Oriental countries. Common - in wet places near drains, ponds, ditches, irrigation channels or in gardens.

Fl. & Fr. : February - May

Ajitmal, : 42.

16. *Sagittaria trifolia* L., Sp, Pl. 993, 1753; Hartog in Fl. Males. ser. 1. 6 : 915, 1972; Ghafoor in Fl. W. Pak. 68: 8, 1974. - *Sagittaria sagittifolia* L., auct. Non L. 1753; FBI. 6: 561; FUGP. 3: 30 - *Sagittaria sagittifolia* ssp. *leucophloea*

(Miq.) Hartog in Fl. Males. ser. 1. 5: 332, 1957. Vern: *Chhota Kut.* (Alismataceae).

Leaves emergent, ovate or linear-lanceolate, sagittate or hastate below, 5-10 x 5-7 cm, petiole upto 75 cm long, spongy, 3-angular. Petals with purple and white claw. Stamens 24 in male flowers and converted into staminodes in female flowers.

Tropics of Asia and Pacific. Frequent- in marshy places, shallow ponds or ditches.

Fl. & Fr.: November- March

Etawah: 462.

17. *Typha australis* Schum & Thonn., Denske Vidensk. Afhandl. 4. Ser 4: 175, 1829; Riedl. in Fl. Iranica 71:5, 1970. *Typha angustata* Bory & Chaub. In Bory Exp. Sci. Moree 3: 33, 1832; FBI. 6: 489; FUGP.3: 293; Subramanyam, Aquatic Angios. 74, 1962; FFPUP. 3 : 702. Vern: *Patar* (Typhaceae).

A palustous or aquatic, rhizomatous herb, upto 3m tall. Leaves elongate-linear, thick and spongy, sheathing at base, up to 2.5m long. Flowers in groups up to 30 cm apart each other on the same axis. Male flowers: deciduous; perianth of 3 flattened hairs; stamens 3., filaments long clavate pistillodes; bracteoles deciduous, long. Clavate, perianth of many capillary bristles; ovary stalked, hairy; style slender; stigma filiform; fruit a drupe.

India, Australia, Occasional- in shallow ponds or sometimes in ditches.

Fl. & Fr.: October- May

Ajitmal. 659

18. *Utricularia exoleta* R. Br., Prode. 430, 1810; FBI. 4 : 329; FUGP. 2 : 166; Taylor, Fl. Males, Ser. 1.8:294, 1977-*Utricularia gibba* ssp. *exoleta* (R.Br.) Taylor, Milt. Bot. Staatesamml. Munchen 4: 101, 1961; Basak, Bull Bot. Surv. India 17:100, 1978 (Lentibulariaceae).

Small, floating or submerged herbs upto 15cm long; stolons slender, leafy segments capillary; bladders minute. Scape 1-3- flowered; calyx segments equal, broadly elliptic, obtuse. Corolla yellow 4.8mm long; upper lip 3.4mm wide; spur usually slightly longer than lip, narrowly conical, straight. Stamens 2, inserted at the base of corolla, anthers confluent, dorsifixed. Stigma unequally 2-lobed. Capsule globose, up to 4mm across. Seeds flat, orbicular. *Paleotropic.* Common in undisturbed ponds and lakes.

Fl. & Fr.: November- December

Etawah: 1036

19. *Vallisneria spiralis* var. *denseserrulata* Makino, Bot. Mag. Tokyo 28: 27, 1914; Lowdon, Aquat. Bot. 13:288, 1982.- *Vallisneria spiralis* L. Sp. Fl. 1015, 1753; FBI. 5:

660; FUGP. 3: 174; Subramanyam, Aquatic Angios. 57, 1962. (Hydrocharitaceae).

A stoloniferous herb, leaves clustered at nodes, up to 35 cm long, faintly toothed. 5-9 - nerved, sheathing at base. Male flowers numerous in short- peduncled, 3 - lobed spathe near the base. However, after early detachment float on water surface; sepals 3; petals absent, stamens 1-3, pistillode absent. Female flowers staminodes 3, 2- fid; ovary covered by spathe; styles 3: stigma 3-lobed; fruit liner; seeds fusiform, embedded in gelatinous mass. *Cosmopolitan.* Occasional - in ponds and ditches.

Fl. & Fr.: October- March

Auraiya. 1250

20. *Veronica anagalis-aquatica* L. Sp. Pl. 12, 1753; FBI. 4: 293; FUGP. 2: 154; Pennel, Acad. Nat. Sci. Philad. Monogr 5:89, 1943; Chatterjee & Bharadwaja Bull. Bot. Soc., Bengal 9:148, 1956. (Scrophulariaceae).

An erect or decumbent, ascending, simple or branched herb, up to 50 cm long. Young parts patent- hairy. Stem often fistular at age. Leaves sessile, amplexicaul at base, subentire, crenate to serrate, 5-15 cm long. Bracts linear. Corolla pale purple or white.

North temperate. Common-near drains and other moist places in garden, along marshy banks of ponds or ditches.

Fl. & Fr.: October- March

Ajitmal.: 47, 1190.

21. *Wolffia arrhiza* (L.) Horkel ex Wimmer, Fl. Schles. ed. 3.140, 1857; FBI. 6: 557; FUGP. 3: 306; Plas in Fl. Males, ser. 1.7:237, 1972; Hepper in Rev. Handb. Fl. Ceylon 2: 402, 1981. - *Lemna arrhiza* L., Mant. Alt. 294. 1771 (Lemnaceae).

A frond with round or ovate dorsal outline. 0.5- 1.5 mm across, slightly convex on upper surface, base and apex obtuse; ventral side strongly inflated. Inflorescence consisting of a spatheless cavity containing 1 female and 1 male flower.

Cosmopolitan. Occasional in ponds and ditches.

Fl. & Fr.: September- October

Achhald. :1253

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