

Less Known Aquatic Plants of Uttar Pradesh

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Introduction

Biodiversity, according to the widely accepted definition in the Convention on Biological Diversity, encompasses “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (CBD, 1992). India contains a great wealth of biological diversity in its forests, its wetlands and in its marine areas. Biodiversity has great importance for human survival and economic well-being and for the ecosystem function and stability. All plant species present in an ecosystem are equally important as per their role in the structure and functioning of the ecosystem.

The increasing biotic pressure on the ecosystem and the ruthless over exploitation of natural resources in general threaten the aquatic plants leaving behind many as a rare, threatened and endangered species. Many factors, both natural and man-made, have been responsible for extinction of aquatic plants. But in some cases, species become too old or senescent and suffered genetic depletion, thus becoming unable to adapt to the new environment, leading to their restricted distribution and eventually extinction (Tomar *et al.*, 2006). Normally for a species the processes involved in its evolution, spread and finally extinction are very slow. While such natural processes in the past had no doubt led to the extinction of species, they had also contributed to the evolution and speciation of plants. Anthropogenic factors, on the other hand, have accelerated rarity and extinction of plant species to a

level where the very existence of ecosystems is threatened (Kant and Sharma, 2005).

Leopold (1953) and Ehrlich and Mooney (1983) similarly advocated that, in lieu of evidence to the contrary, all species be assumed to contribute in important ways to the ecosystems in which they exist. This approach is justifiable, however, only if we find that less common or rare species can contribute significantly to ecosystem functioning. Given that we rarely study the specific effects of uncommon species on ecosystem properties, we know little about the role these species may play in ecosystems. If, on occasion, we demonstrate that less common species do have strong impacts on ecosystem stability and functioning, a precautionary approach is warranted because of the possibility that many other not-yet-studied species may be important.

Aquatic plants are the plants, normally found in nature growing in association with running or standing water whose level is at or above the surface of soil. The plant may be floating, completely submerged or partly submerged in the water. In some instances the plants may merely be growing near the water but in the definite association with it. Some of the lesser known aquatic plants reported from Uttar Pradesh are described below:

1. ***Aeschynomene aspera* L.**, Sp. Pl. 713. 1753; Baker in Hook.f., Fl. Brit. India 2: 152. 1876; Duthie, FUGP.1: 270. 1903; Subram., Aquatic Angios. 14. 1962; Cook, Aquatic and Wetland Pl. Ind. 207. 1996.

Vern: Sola.

Perennial, aquatic or marshy erect herbs upto 2 m tall with spongy stem. Leaves 7-15 cm long, shortly



Aeschynomene aspera L.

petiolate, rachis 6-22 cm long, ending in a minute stipe; leaflets numerous, alternate or opposite, linear-oblong, obtuse, glabrous, 1-nerved, 5-15 × 2 mm; stipules linear to lanceolate, auricled at base, 12-13 mm long, deciduous. Racemes simple or branched, 2-6-flowered, 4-8 cm long. Flowers ca 2 cm long. Calyx bilabiate, upper lip rounded, lower 3-lobed, 5-10 mm long; bracteoles 2. Corolla 16-20 mm long, yellow to brown yellow. Pods 3.5-8 cm long, 3-8 jointed, echinate on both the surfaces. Seeds kidney shaped, black, glossy.

Fl. and Fr.: August - January.

Rare: near pools and puddles.

2. *Neptunia oleracea* Lour., Fl. Cochinch. 654. 1790; Baker in Hook. f., Fl. Brit. India 2: 285. 1878; Duthie, FUGP. 1: 306. 1903; Subram., Aquatic Angios. 15. 1962; Cook, Aquatic and Wetland Pl. Ind. 209-210. 1996.

Vern.: Lajalu.

Stout, free floating, slender, aquatic herbs. Stem horizontal, hardly branched with thickened nodes, developing white spongy tissue when in water, rooting at nodes. Leaves with glandless petiole, bipinnate; pinnae 2-3 pairs, 5-8 cm long; leaflets 8-15 pairs, linear, obtuse. Flower-heads axillary, long peduncled, dimorphic; peduncles 8-30 cm long; upper flowers hermaphrodite, lower ones sterile. Calyx small, campanulate. Corolla 1 mm long. Staminodes strap-shaped, yellow. Pods 1.5- 2.5 cm long, oblique, oblong, beaked, 6-10-seeded.



Neptunia oleracea

Fl. and Fr.: September - April.

Rare: in swamps, slow flowing streams and lakes.

3. *Achyranthes aquatica* R. Br. Prodr. 417, Hook. f. Fl. Brit. India IV. 730; Schinz in Engl. and Prantl, Pflanzenfam. III. 1A, 112.

Herbs, perennial or perhaps sometimes annual, stems prostrate, straggling or erect, up to 1.5 m long, usually much branched, spongy and inflated below, up to 2 cm in diameter. Leaves opposite; petioles 0.4-4 cm long; lanceolate to ovate, pilose beneath with appressed white hairs when young. Inflorescence usually terminal, erect, spikes, 4-12 cm long in flower, elongating to 25 cm in fruit. Flowers at first crowded, latter remote. Bracts persistent, 3-4 mm long, hyaline; bracteoles orbicular, up to 2 mm long. Perianth segments 5,



Achyranthes aquatica R. Br.

glabrous, unequal, 5-8 mm long. Stemens 5; anther 4 locular; staminodes with a fimbriate dorsal appendage. Nut thin walled.

Fl. and Fr.: September-November.

Rare: emergent in shallow water or straggling over the waters surface.

4. ***Butomopsis latifolia*** (D. Don) Kunth, Enum. Pl. 3: 165. 1841. *Butomus latifolius* D. Don, Prodr. Fl. Nepal. 22. 1825. *B. lanceolatus* Roxb., Fl. Ind. 2: 315. 1832. *Butomopsis lanceolata* (Roxb.) Kunth, Enum. Pl. 3: 165. 1841; Hook.f., Fl. Brit. India 6: 562. 1893; Duthie, FUGP. 3: 311. 1929. *Tenagocharis latifolia* (D. Don) Buchenau in Abh. Naturw. Ver. Bremen 2: 6. 1868; Subram., Aquatic Angiosp. 88. 1962.



Butomopsis latifolia (D. Don) Kunth

Annual, aquatic, submerged, fibrous rooted, rhizomatous herbs, upto 50 cm tall, sap milky. Leaves elliptic-lanceolate, entire, 5-7 nerved, petiole longer than blade. Scapes much exceeding leaves, terminating in an umbel of 3-20 flowers; pedicels unequal; bracts scarious, ovate, acute; axis often produced beyond the umbel to bear another whorl of flowers. Sepals scarious-margined. Petals white, longer than sepals, disintegrating into a gelatinous mass after anthesis. Stamens 8-9. Carpels 4-9, style short, stigma yellow. Fruitlets with tips exerted from calyx. Seeds numerous, dark-brown, shining.

Fl. and Fr.: September - April.

Occasional: in shallow water, lakes and ponds.

5. ***Scirpus litoralis*** Schrad., Fl. Germ. 1: 142. t. 5. f. 7. 1806; C. B. Clarke in Hook.f., Fl. Brit. India 6: 659. 1893; Duthie, FUGP. 3: 362. 1929.

Perennials, 0.6-2 m high. Rootstocks very short, sometimes bearing slender stolons. Stem stout, terete below, trigonous above. Leaves long or short, or reduced to bladeless sheaths. Anthela lateral, compound or decompound, with suberect branches, upto 10 cm across; bracts erect, as though a continuation of the stem, 2-15 cm long. Spikelets mostly solitary, oblong-cylindrical, 10-18 mm long. Glumes red-brown, elliptic-oblong, ca 3 mm long, notched, cuspidate, with scarious margins. Perianth of 2-7, red-brown, bristle like or scale like,



Scirpus litoralis Schrad.

plumose segments, longer than the nut. Stamens 2-3. Stigmas 2. Nuts dark brown, bi or plano-convex, ca 2 mm long, apiculate, smooth.

Fl. and Fr.: December - April.

Rare: in shallow water.

6. ***Lolium temulentum*** L., Sp. Pl. 83. 1753; Hook.f., Fl. Brit. India 7: 364. 1896; Bor, Grass. Burm. Ceyl. Ind. Pak. 546. 1960.

Annuals. Culms 15-60 cm tall, erect; nodes glabrous. Leaves 10-20 cm long, acute at apex; sheaths glabrous; ligules membranous, truncate. Inflorescence a solitary spike; rachis flexuous. Spikelets alternate, elliptic or oblong, 5-15



Lolium temulentum L.

flowered. Lower glume absent; upper glume elliptic-oblong, ca 9 mm long, 5-nerved, 2-keeled, serrulate along keels. Anthers 3, pale yellow, linear, 2-3 mm long. Caryopsis oblong, 4.5-5 mm long.

Fl. and Fr.: December - May.

Rare: in marshy places.

Plant specimens collected from field were

identified by using the available floras (Biswas and Calder 1937, Duthie 1903-1929, Cooke 1996, Mishra and Verma 1992, Verma and Mishra 1981, Maliya and Singh 2004, Subramanyam 1962). Final Identification of the plant specimen was done after consulting relevant literature. Herbarium specimens have been deposited in Duthie Herbarium, Department of Botany, University of Allahabad, Allahabad.

Conclusion

In view of the current threats to the aquatic biodiversity of the region, the information on threatened aquatic plants needs to be updated. Scientifically much more work is required to be carried out in less known aquatic plants, facing various degree of threats. Authors strongly feel that there is an urgent need to document the inventory of their habitats; uses and cultivation practices since many such treasures being ignored and some of these have started disappearing. We must arrest this trend. Adoption of such an approach will go a long way in conservation of lesser known aquatic plants, their planting and maintenance is thus recommended.

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