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ENVIS Newsletter
on wetland ecosystems including inland wetlands



Sarovar Saurabh

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Picture Courtesy: Bhupesh Gupta



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The photographs of the plant species used in this issue are courtesy Dr. K. Ravikumar and FRLHT, Bengaluru

Views expressed in the articles of this newsletter are of the authors only.

Instructions to Contributors

We welcome original research and popular articles, reviews, reports, research highlights, notes, news, snippets, etc., related to the thematic area of the ENVIS Resource Partner for publication in 'Sarovar Saurabh the ENVIS Newsletter on "Wetland Ecosystems including Inland Wetlands"'.

'The articles and other information should be neatly typed in double space not exceeding five pages. The figures, graphs/drawings should be of good quality and clarity. Photographs should be of minimum 300 dpi resolution. References should be limited and cited in the text by name and year. Council of Science editors style may be referred to for listing references at the end.

Email your articles in MS-Word 2003 or 2007 format to sacon-env@nic.in or salimalicentre@gmail.com

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From The Editors' Desk

Water is universally known as elixir, wherein life originated and evolved. Plants during the evolutionary phase moved out of water, conquered the land and became dominant over it. Some plants, however developed appropriate adaptations (morphological and physiological) that helped them grow back in the aquatic and /or semi aquatic habitat.

Most shallow water bodies support the growth of some kind of larger plants, besides microscopic phytoplankton and algae. The large plants also called as macrophytes are seldom recognised as an important component of the aquatic systems. Moreover, while utilizing the water/aquatic resources, man found the exuberant growth of the aquatic vegetation as interference and undesirable. It is only in the past few decades with growing understanding of the aquatic ecosystems have we started to recognise their importance.

In this issue we have compiled information on some commonly sighted aquatic plants that have ecological significance. In addition to the publication we also have the news on wetlands that is shared for all.

During this quarter we observed the "World Wetlands Day" and published the posters that were circulated online as well as in print to local institutions. Our website host a variety of information on the latest conferences, laws, rules & regulations on wetlands, bibliography, conferences updates, news and other information that can be accessed easily. Further, it will help us if you can communicate the activities associated with wetlands and you would have undertaken. We will include it on our website and help reach the information to the masses.

Dr. K. Sankar,
Director, SACON

A look into the Aquatic Vegetation

There is no universally accepted definition for aquatic vegetation, however they are considered as plants that have adapted to living in aquatic environments (saltwater or freshwater). All plants from the aquatic habitat cannot be termed by one word hence they are also referred to as marsh plants, wetland plants, hydrophytes or macrophytes. Aquatic vegetation are a natural part of most water bodies and provide many benefits to fish, wildlife, and people. Aquatic vegetation is important for the health of waterbodies. Aquatic plants are the primary producers in the aquatic food chain, contributing to the balance of oxygen, nutrients and sediment, and providing habitat and food for fauna. These plants are divided into four groups namely algae, floating plants, submerged plants and emergent plants. The principal factor controlling the distribution of aquatic plants is the depth and duration of flooding. However, other factors may also control their distribution, abundance, and growth form, including nutrients, disturbance from waves, grazing, and salinity.

A general review on more common and important aquatic angiosperms in India was published by Subramanyam (1962 a, b) where he listed 117 species covering 32 families. Since then a number of reports have appeared on the aquatic plants of individual water bodies and many new taxa have been reported from India. Lavania *et al.* during 1990 reported about 470 species of flowering plants, 50 percent of the world's known aquatic angiosperms to represent the Indian subcontinent. Christenhusz and Byng (2016) have counted the currently known, described and accepted number of flowering plant species as 295,383. Vatsavaya *et al.* (2010) have reported 19,530 species (includes 282 subspecies and 2,206 varieties) of angiosperms to occur in India against the global numbers. In this present issue, we have collated the information on nine species that one would regularly come across in the Indian wetlands.

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Picture Courtesy: K. Ravikumar

Pith Plant

Scientific Name: *Aeschynomene aspera*

Family: Leguminosae

Phenology: October to November

IUCN Status: Least Concern

Habitat: The species typically grows on the margins of wetlands, such as lagoons, tanks and lakes as well as in swampy grassland. Found from sea level to 1,300 m

Uses: Fatty Oil. It is administered against tuberculosis, skin infections, antidote to snake venom, menstrual disorders and small pox.

Special notes: This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby.

Water Primrose



Picture Courtesy: K. Ravikumar

Scientific Name: *Ludwigia adscendens*

Family: Onagraceae

Phenology: January to June

IUCN Status: Least Concern

Habitat: Common in ponds and ditches

Uses: Leaf extract is taken for curing dysentery. Whole plant is used as a poultice in ulcers and other skin diseases. Extracts of leaves and stem exert strong antimicrobial activity similar to that of standard antibiotics. Flower petals possess anti-inflammatory activity and causes dose-dependent inhibition of carageenin-induced rat paw oedema similar to that of hydrocortisone

Special notes: The roots of Water primrose, the most peculiar structures, are also worth mentioning. This plant has two types of roots, one that anchor the plant to the soil and the other that look like tiny bananas (and that's why it's also called "water banana" elsewhere). The latter contains air sac.

Marsh Marigold



Picture Courtesy: K. Ravikumar

Scientific Name: *Caltha palustris*

Family: Ranunculaceae

Phenology: March to August

IUCN Status: Least Concern

Habitat: It occurs in a wide variety of wet habitats, from wet woodland and the margins of rivers, streams, lakes, ponds, ditches and canals to wet grassland. It is usually scarce or absent in acid habitats.

Uses: Every part of this plant is strongly irritant and so it should be used with caution. The whole plant is anodyne, antispasmodic, diaphoretic, diuretic, expectorant and rubefacient. It has been used to remove warts and is also used in the treatment of fits and anaemia. The root is antirheumatic, diaphoretic, emetic and expectorant. A decoction is used in the treatment of colds. A poultice of the boiled and mashed roots has been applied to sores. A tea made from the leaves is diuretic and laxative. All parts of the plant can irritate or blister the skin or mucous membranes.

Special notes: *Caltha* contains several active substances of which the most important from a toxicological point of view is protoanemonin. Larger quantities of the plant may cause convulsions, burning of the throat, vomiting, bloody diarrhea, dizziness and fainting. Contact of the skin or mucous membranes with the juices can cause blistering or inflammation, and gastric illness if ingested. Younger parts seem to contain less toxics and heating breaks these substances down. Small amounts of *Caltha* in hay do not cause problems when fed to husbandry, but larger quantities lead to gastric illness.

Oval-leaved Pondweed



Scientific Name: *Monochoria vaginalis*

Family: Pontederiaceae

Phenology: July to November

IUCN Status: Least Concern

Habitat: An annual or pseudo-annual in flooded rice fields, but may grow as a perennial in constantly flooded areas. Also found in ditches, ponds, and swamps.

Uses: Plants for tonic and leaves juice for boil. It is used in Ayurvedic, Unani and folklore medicine. The root is used for toothache and the bark is eaten with sugar for asthma.

Special notes: It is often an invasive noxious weed, and is listed on the United States Federal Noxious Weed List. As is typical of many aquatic annuals, plant size, leaf shape, and flower number are highly variable in relation to the amount of water.



Picture Courtesy: K. Ravikumar

Scientific Name: *Menyanthes trifoliata*

Family: Menyanthaceae

Phenology: May to July

IUCN Status: Least Concern

Habitat: *M. trifoliata* is found in various wetland habitats such as fens, pools, marshes, older woods, ditches, bogs, lake shores, swampy prairies, particularly in acid or oligotrophic conditions.

Uses: It has a bitter taste, and was once used to treat jaundice and rheumatism. It is used to treat leukaemia and anorexia, and as a laxative.

Special notes: The plant floats on the surface with its porous rootstock. If the area dries out or gets covered with bog moss, bogbean gradually stops flowering, although it will grow for a long time with just leaves.

Water chestnut



Picture Courtesy: K. Ravikumar

Scientific Name: *Trapa natans*

Family: Trapaceae

Phenology: September to October

IUCN Status: Least Concern

Habitat: This plant is an annual floating-leaved plant that grows in stagnant waters, lakes, channels with weak currents, ponds and swamps. It primarily occurs in unpolluted nutrient-rich lowlands without too much calcium; it is important as a food source for birds and provides fish spawning habitat.

Uses: In cooling and stomachic. Prevents goitre and thyroid problems, full of nutrition, Cures tonsils, remedy for cracked heels and lips, fruits are used in making liniments for the cure of elephantiasis, rheumatism, sores and sunburn. It is also said to have cancer-preventing properties.

Special notes: *T. natans* features a rosette of floating, fan-shaped leaves, each leaf having a slightly inflated petiole (stem); the roots are fine, long and profuse. The small, 4-petalled flower is white and the fruit is a large nut with four sharp spines.

Corkscrew Rush



Picture Courtesy: K. Ravikumar

Scientific Name: *Juncus effusus* Family: Juncaceae

Phenology: July to November IUCN Status: Least Concern

Habitat: *Juncus effusus* is a tuft-forming perennial which may occur as scattered plants or stands in natural and semi-natural habitats. Extensive stands and become dominant to the exclusion of other species as a result of inappropriate land-use such as over-grazing of wet pasture. *Juncus effusus* occurs in most wetland habitats but is most typical of wet pasture and moorland. It is common on the margins of rivers, ponds, lakes and ditches and will occur as scattered stands in open, wet woodland. It apparently does not establish in base-rich soils and is most characteristic of sandy and peaty substrates, especially open heaths and moors.

Uses: It is used in the treatment of sore throats, jaundice, oedema, acute urinary tract infection and morbid crying of babies.

Special Notes: Soft rush is commercially grown in Japan for making tatami (woven mats for homes). From ancient times until the early 1900s, soft rush stems were used in England to create inexpensive, candle-like evening lights called “rushlights.” Rush stems were peeled away and the inner pith was soaked in animal fat, grease or wax. When dry, the pith could be lit at one end (sometimes both ends) and burned like a candle. *Juncus* means rush, and *effusus* means loose-spreading in probable reference to plant habit.

Bulrush



Scientific Name: *Typha angustifolia* Family: Typhaceae

Phenology: December to February

IUCN Status: Least Concern

Habitat: It grows in shallow water of lakes, rivers, ponds, marshes, and ditches.

Uses: As an astringent and diuretic.

Special notes: By its creeping rootstocks, this typical marsh perennial forms dense stands in shallow water and provides a favorable habitat for red-winged blackbirds, as well as other marsh birds, and muskrats.

Picture Courtesy: K. Ravikumar

Sweet Flag

Scientific Name: *Acorus calamus* Family: Araceae

Phenology: October to November

IUCN Status: Least Concern

Habitat: The species grows on the margins of standing or slow-flowing water, typically in river backwaters, canal margins and the margins of ponds and lakes.

Uses: Snake bite, for eye treatments. The roots are made into a paste with milk and given to children to improve digestion.

Special notes: In most localities the flowers are not very abundantly produced: it never flowers unless actually growing in water.



Picture Courtesy: K. Ravikumar

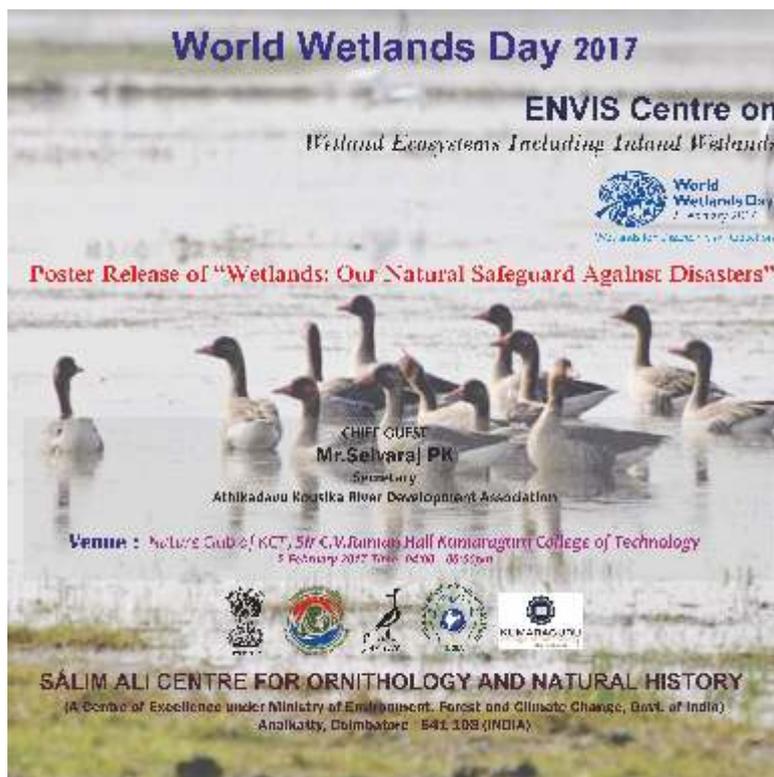
World Wetlands Day 2017

The SACON ENVIS team along with the Nature club of Kumaraguru College of Engineering and Technology, Coimbatore celebrated the World Wetlands Day 2017 by releasing a poster which carried the theme “Wetlands: Our Natural Safeguard against Disasters”.

Mr. Selvaraj P. K., Secretary, Athikadavu Kousika River Development Association gave a talk on “Importance of Wetlands and how to Conserve them”. Around 100 students and staff members of Kumaraguru College of Engineering and Technology attended the programme.



World Wetlands Day 2017 Poster



World Wetlands Day 2017 Invitation



Students and staff members of Kumaraguru College of Engineering and Technology, Coimbatore

Five of the seven new 'Night Frogs' have small ranges and their habitat is under threat, say Scientists
 Scientists exploring the forests of the Western Ghats have come across four new species of tiny frogs no bigger than a human thumbnail, which make a distinctive chirping sound comparable to the one of a cricket.



These species are among the seven new 'Night Frogs' discovered by a team of researchers from the University of Delhi and the Kerala Forest Department, who spent five years surveying the global biodiversity hotspot.

'Night Frogs' belong to the *Nyctibatrachus* genus endemic to the Western Ghats and represent an ancient group of frogs that diversified on the Indian landmass approximately 70 to 80 million years ago.

The scientists were surprised by the relative abundance of the previously unknown species at their collection localities.

"The minuscule frogs have probably been overlooked because of their extremely small size, secretive habitats and cricket like calls," says Sonali Garg, who undertook the study as part of her Ph.D research at the University of Delhi.

The scientists used an integrated taxonomic approach that included DNA studies, detailed morphological comparisons and bioacoustics to confirm the new species. The findings have been published in the latest issue of PeerJ, an open access journal.

Hydroelectric project

While turning the spotlight on the amphibian diversity of the Western Ghats, the discovery also highlights the threat posed by human activities to the species.

The Athirappilly Night Frog was found close to the Athirappilly waterfalls, the proposed site of a hydroelectric project, while the Sabarimala Night Frog was discovered near the hill shrine which receives lakhs of pilgrims every year. The Radcliffe's Night frog and the Kadalar Night Frog were reported from plantation areas.

"Over 32% of the frog species in the Western Ghats are already threatened with extinction. Out of the seven new species, five face considerable anthropogenic threats and require immediate conservation," says Professor S.D Biju, who led the study and has formally described over 80 new species of amphibians from India.

Restricted range

"Because several of the new species have been identified as being range restricted and impacted by threats, it is important to assess their extinction risks and tailor conservation strategies for both species and habitats," said Ariadne Angulo, Co-Chair, Amphibian Specialist Group, IUCN, in an emailed response.

The discovery has taken the total number of known *Nyctibatrachus* species to 35, of which 20% are diminutive in size (less than 18 mm).

As many as 103 new amphibian species have been described from the Western Ghats region between 2006 and 2015.

Source: <http://www.thehindu.com/sci-tech/energy-and-environment/tiny-frog-species-found-in-western-ghats/article17342306.ece>