Bioscience Discovery, 12(2):48-53, April - 2021

Open Access, Peer Reviewed, Refereed Research Journal

Print & Online available on https://jbsd.in
ISSN: 2229-3469 (Print); ISSN: 2231-024X (Online)

Research Article

Diversity of wetland plants of Tripura

Moumita Saha

Department of Botany, Shri Gnanambica Degree College, Madanapalle, Andhra Pradesh
Email: sahamou1987@gmail.com

Article Info

Received: 10-01-2021,
Revised: 19-03-2021,
Accepted: 26-03-2021

Keywords: Diversity, Wetland plants, Tripura

Abstract

The survey of floristic wealth of a region is a pre-requisite for conservation of depleting genetic resources. The present paper deals with an account on floristic composition of wetland plants of Tripura, North-East India. Field survey was conducted in and around the river system to collect information about the wetland flora. Data on the use of plants was collected with a semi structured questionnaire and from the peer-reviewed literature. A total of 40 angiosperm species belonging were identified along with their botanical name, vernacular name, and family. In the biological spectrum, the dicotyledons are the most divergent because of number of species and genera. The documentation on the traditional uses of wetland plants with ethnomedicinal potential will be helpful in conservation as well as synthesis of new herbal drugs with various combinations of plants that can be used in the treatment of different diseases at global level. Meanwhile, the depth of the river is gradually shrinking due to severe anthropogenic factors, therefore, there is an urgent need to conserve the biodiversity as well as quality of drinking water.

INTRODUCTION

Wetlands are the ecotones between the terrestrial and aquatic ecosystems which is often termed as kidney of the landscape (Mitsch and Gosselink 2000) and are remarkable landscapes of the world which covers approximately 6% of its area (Maltby E and Turner R E 1983) and provides 45% of world's natural productivity and ecosystem amenities (MAweb, 2005). Due to their habitation characteristics, it is difficult to ascertain a clear definition of vascular hydrophytes. Reid (1961) described hydrophytes as "plants whose seeds germinate in either the water phase or the substrate of a body of water and must spend part of their life cycle in water. The diversity of macrophytic flora in the wetland of India is characterized by more than 610 species belonging to 235 genera under 87 families (Cook, 1996).Wetland plants are emerging copiously in lakes and watercourses of tropical countries (Allen *et al*, 1989) and they represents considerable part of the world flora. Elimination of hydrophytes are absurd as the threatening signifies a natural source of green leaves. In recent years, many species are gradually becoming rare in their earlier area of occurrence due to habitat modifications, over harvesting and invasion of exotic as well as aggressive weeds (Lacoul and Freedman, 2006).

Wetlands in India are recognized as the richest and mesmerizing biomes that maintain around 800 plant species consumed as food though it covers only 5% of the total geographical area. Numerous authors (Banerjee and Matai, 1990; Boyd, 1968) have emphasized the prospective of aquatic plants as nutriment and feed and several thousands of rural families in developing countries use many of them for subsistence of human livelihood support. Local people inhabiting in the newly formed Khowai district have traditional knowledge about the uses of ethno-edible wetland plants.

Ethno-medicinal studies suggest immense scope and prospects for biodiversity conservation as well as ecological growth of local communities around the world (Chaudhary *et al.,* 2011). Thus, the main aim of the present study is to document the local knowledge about the plant resources used by the folk people of Tripura, India may help in developing sustainable use and minimise loss of native wetland biodiversity.

MATERIALS AND METHODS

Study site

Tripura is a state in North East India and the third-smallest state in the country. It covers 10,491 sq. km and is bordered by Bangladesh to the north, south, and west; the Indian states of Assam and Mizoram lie to its east. Tripura is located approximately between 22°56' and 24°32' N latitude and between 90°09' and 92°20'E longitude. The climate of Tripura is characterized by intermediate temperature and highly humid atmosphere. The year may be divided into four seasons, December to February is the winter followed by summer (March-May), June to September is the monsoon and October to November is the post monsoon period. The cold weather starts at the end of November and continues up to February with daily maximum temperature of 26°C and minimum 8-4°C. Humidity remains high throughout the year. In summer, the relative humidity ranges from 50-75% while during monsoon it remains over 85%.

There are many rivers, lakes and ponds in Tripura.. The survey conducted in and around reveals the occurrence of a considerable number of species in stagnant water and wet places. The presence of huge water bodies favours the occurrence of a rich hydrophytic flora in the river system.

Data collection:

The field study was carried out monthly following established and standard procedures (Jain 1987, Martin 1995). Plant species were identified by the author on the basis of different monographs and standard floras including Arber (1920), Biswas and Calder (1936), Maheswari (1960), Subramanyam (1962), Deb (1981, 1983) and Fassett (2000) The collected samples were processed in the laboratory following mostly conventional techniques (Jain and Rao, 1977) and the voucher specimens were deposited in the Herbarium of the Department of Botany, Tripura university.

RESULTS AND DISCUSSION

A thorough floristic study of the Khowai river system of Tripura reveals the occurrence of 40 taxa of aquatic and marshland plants. These 40 taxa are belonging to 35 genera covering 25 families. The genera and species are listed alphabetically along with their local name, habit, occurrence, availability in the study area, references to voucher specimens and uses if any. Out of these plants, Pteridophytic plants are represented by a single family with a single species. The rest 39 species belongs to Angiosperms, of which Magnoliopsida is represented by 19 families, 25 genera and 30 species while Liliopsida have 6 families, 10 genera and 12 species. The Magnoliopsida are most divergent on the basis of number of species and genera. The ratio of families of Pteridophytes, Dicots and Monocots is 1:19:6 and for the generic and species level this ratio is 1: 25: 10 and 1: 30: 12 respectively. The percentage of distribution of genus in five dominant families is presented in **Figure-1**. The photographs of some medicinal and edible plant species are shown in **Plate-1.** From the enumeration it has been found that the family Poaceae with 5 taxa is the most diversified family of aquatic and wetland plants, followed by Araceae, Cyperaceae, Asteraceae and Scrophulariaceae with 3 species each.

Enumeration of Wetland plants of Tripura

Alocasia indica (Roxb.) Schott. [Araceae]; A robust herb, leaves large, sagittately cordate, spathes long, greenish yellow.

Local name: Mankachu

Exsiccatae: *Saha and Datta 333*

Uses: Root stock is edible.

Alternanthera philoxeroides (Mart.) Griseb. [Amaranthaceae]; A perennial herb, leaves opposite, tepals oblong, white.

Local name: Jal daraga

Exsiccatus: *Saha 223*.

Uses: As haemostat in cut wounds

Centella asiatica (L.) Urban [Apiaceae]; A herb with long creeping stems, leaves reniform, umbels several at each node.

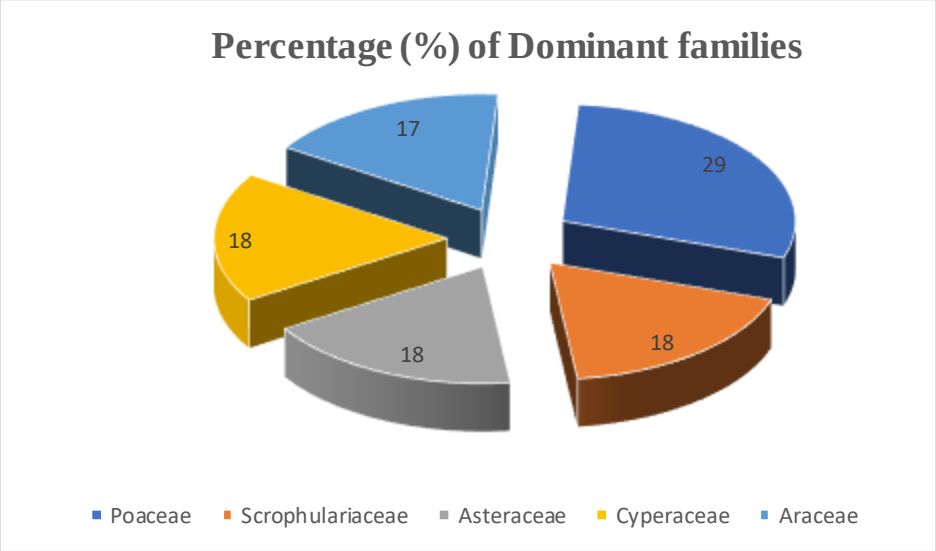
Local name: Thankuni.

Exsiccatus: *Saha 386*.

Uses: Edible and also used in liver disorder.

Colocasia esculanta (L.) Schott. [Araceae]; A stout tuberous herb, slightly swollen at the base of leaf sheaths, leaves large, peltate with a broad triangular basal sinus, spathe long, pale yellow, spadix shorter than the spathe.

Local name: Kachu.



Exsiccatae: *Saha and Datta 299*
Uses: Cultivated for edible rhizomes and leaves are used as vegetable.
Commelina benghalensis L. [Commelinaceae]; A small diffuse herb, leaves elliptic- ovate, rounded at the base, sheaths pubescent, flowers blue, cymose.
Exsiccatae: *Saha and Datta 392*.
Uses: The whole plant is eaten as vegetable.
Commelina paludosa Bl. [Commelinaceae]; A herb with branching stem, leaves lanceolate, caudate, spathes subsessile, funnel shaped, racemes simple.
Exsiccatae: *Saha and Datta 301*.
Uses: Young shoots are eaten as vegetable.
Cynodon dactylon (L.) Pers. [Poaceae]; A perennial creeping herb, culms glabrous, leaves distichous on the barren shoots and at the lower part of culms, leaf blade linear, spikelets green, glumes lanceolate, lemma boat shaped, ciliate on the keel.
Exsiccatae: *Saha and Datta 301*.
Uses: Used as fodder.
Cyperus iria L. [Cyperaceae]; An annual herb, glabrous, longitudinally striated, leaves long, scabrous on the margin above, inflorescence decompounds umbel, spikelets pale brown.
Exsiccatus: *Saha 200*
Uses: The culms are used for making mats.
Cyperus rotundus L. [Cyperaceae]; A herb with stoloniferous rhizome, stolons not bulbiferous, covered with loose brown cataphylls, leaves linear, tapering, spikelets dark brown.
Exsiccatus: *Saha 358*.
Uses: Tuberous roots are used in perfumery and in religious rituals.
Diplazium esculentum (Roxb.) Sw. [Athyriaceae]; A terrestrial fern, rootstock erect, fronds bipinnate, pinnae with numerous pinnules.
Exsiccatus: *Saha 300*
Uses: Nil
Dentella repens (L.) J.R. & G. Forst. [Rubiaceae]; A Small prostrate herb, rooting at nodes, leaves subsessile, stipule connate, flowers axillary, solitary, white.
Exsiccatus: *Datta 413*
Uses: It has medicinal importance.
Eichhornia crassipes (Mart.) Solms. [Pontederiaceae]; A floating aquatic herb with spongy leafy axis.
Local name: Kachuripana / Kachurifena.
Exsiccatae: *Saha and Datta 311*
Uses: Nil
Eriocaulon cinereum R.Br. [Eriocaulaceae]; Annuals, acaulescent, leaves acute, scapes slender, heads conical.
Exsiccatae: *Saha and Datta 366.*
Uses: Nil
Enhydra fluctuans Lour. [Asteraceae]; A succulent prostrate herb with short ascending hispid branches, flowers yellowish.
Local name: Helencha.
Exsiccatae: *Saha and Datta 362*
Uses: Tender shoots used as vegetables and as medicine against dysentery.
Hedyotis corymbosa (L.) Lamk. [Rubiaceae]; Erect annual herb, branches obscurely angular, leaves sessile, stipule small, flowers axillary.
Local name: Khet papra.
Exsiccatae: *Saha and Datta 429*
Uses: Nil

Hydrolea zeylanica (L.) Vahl. [Hydroleaceae]; Erect much branched herb, leaves linear, glabrous, flowers numerous on short lateral branches.
Exsiccatae: *Saha and Datta 456*.
Uses: The plant is said to be medicinal.
Hygrophila auriculata (Schumach.) Heine. [Acanthaceae]; An erect herb with sharp spines at the axis, leaves unequal, margins wavy and dentate, flowers bluish violet.
Local name: Kulekhara
Exsiccatus: *Datta 217*
Uses: Leaves used as vegetables and medicine, known to increase blood-haemoglobin level.
Ipomoea aquatica Forst. [Convolvulaceae]; A prostrate floating herbs with perennating root stock, stem fistular, flowers purple.
Local name: Jal Kalmi
Exsiccatae: *Saha and Datta 238*
Uses: Leaves and twigs are eaten as vegetable.
Lasia spinosa (L.) Thw. [Araceae]; A stout herb with thick prickly rhizome, spathe purple;
Exsiccatae: *Saha and Datta 420*
Uses: Tender leaves are eaten as vegetable by local tribe.
Limnophila heterophylla Benth.
[Scrophulariaceae]; A glabrous herb with pinnatifid leaves, flowers pink.
Exsiccatae: *Saha and Datta 383*
Uses: Nil
Lobelia succulenta Bl. [Lobeliaceae]; Prostrate herb, much branching, leaves petiolate, pedicels longer than the leaves, calyx teeth pilose.
Exsiccatae: *Saha and Datta 111*
Uses: Nil
Ludwigia adscendens (L.) Hara [Onagraceae]; A profusely branching aquatic herb with spongy white pneumatophores.
Local name: Gaura sak.
Exsiccatae: *Saha and Datta 191*
Uses: Whole plant is used as vegetable by local tribe.
Ludwigia perennis L. [Onagraceae]; An erect glabrous herb, leaves elliptic lanceolate, flowers yellow, calyx tube adnate to ovary.
Exsiccatae: *Saha and Datta 187*
Uses: Nil
Monochoria hastata (L.) Solm. [Pontederiaceae]; An emerging herb with a well-developed branched rhizome, hastate leaves, petiole, flowers long pedicelled, bright blue.
Local name: Vansha kachu
Exsiccatae: *Saha and Datta 273*.
Uses: Leaf decoction applied locally to heal boils by Tripuri tribe.
Nelumbo nucifera Gaertn. [Nelumbonaceae]; A floating herb with peltate leaves raised above the water; flowers pink or white.
Local name: Lal/ Sada Padma;
Exsiccatae: *Saha and Datta 277*
Uses: Fresh fruits used as vegetable by rural people.
Neptunia prostrata (Lam.) Baill. [Mimosaceae]; A floating herb with spongy stem, branchlet glabrous, leaves pinnate, stipules oblong-ovate, flowers yellow.
Local name: Panilajuk/ Kharai sak.
Exsiccatae: *Saha and Datta 278*
Uses: Used as vegetable by the Manipuri community.
Nymphaea nouchali Burm.*f*. [Nymphaeaceae]; An aquatic herb with floating leaves, orbicular, blotched purple beneath; perianth red.
Local name: Lal sapla
Exsiccatae: *Saha and Datta 281*
Uses: Young tender petiole is used to increase the haemoglobin level.
Nymphaea pubescens Willd. [Nymphaeaceae]; An aquatic herb with floating leaves, orbicular, perianth white.
Local name: Sada sapla
Exsiccatae: *Saha and Datta 279*.
Uses: Young tender petiole is used as vegetable.
Nymphoides cristatum Roxb.[Menyanthaceae]; An aquatic herb with floating leaves, orbicular, corolla white.
Exsiccatae: *Saha and Datta 225*
Uses: Nil
Nymphoides indicum (L.) O. Kuntz. [Menyanthaceae]; An aquatic herb with deeply cordate leaves, pedicels numerous, corolla white with yellow towards the base within.
Local name: Penchuli.
Exsiccatae: *Saha and Datta 173*
Uses: Nil
Ottelia alismoides (L.) Pers. [Hydrocharitaceae]; A submerged succulent herb, lamina ovate-lanceolate, flowers white with yellow spotted base.
Local name: Pani kala.
Exsiccatae: *Saha and Datta 148*.
Uses: Tender peduncle and flower buds are used as vegetable by rural people.

Panicum repens L. [Poaceae]; Culms erect or ascending from a stout creeping rootstock, simple or branched, nodes rooting, leaves distichous, sheath with ciliate margin, ligule hairy, panicle irregularly branched.
Exsiccatus: *Saha and Datta 170*
Uses: It is used as forage for grazing.
Paspalidium punctatum (Burm. *f*.) A. Camus. [Poaceae]; Culms long, rooting at the lower nodes, sometimes decumbent, nodes glabrous, leaves linear or linear-lanceolate, panicles long, spiciform, racemes long, spikelets long, ovate or broadly elliptic.
Exsiccatae: *Saha and Datta 332*
Uses: Nil
Paspalam scrobiculatum L. [Poaceae]; A loosely tufted, shallow rooting, small herb, culms with four to six nodes, leaves flat, soft, completely hairless on mature plants, ligule membranous, no auricles, spikelets one-flowered.
Exsiccatae: *Saha and Datta 130*
Uses: Leaf paste is used against ring worm.
Phragmites karka (Retz.) Trin. *ex* Steud. [Poaceae]; Perennial herbaceous grass producing somewhat woody culms from an extensive, creeping rhizome.
Exsiccatus: *Saha and Datta 122*
Uses: Used for manufacturing paper and for making mats, baskets etc.
Rotala rotundifolia (Willd.) Koehne [Lythraceae]; Aquatic or amphibious annual herbs, stem creeping, herbaceous, glabrous, quadrangular, red tinged, branches decumbent, leaves simple, opposite decussate, ovate-elliptic, flowers in 1-4 terminal, emergent bracteate spikes.
Exsiccatae: *Saha and Datta 155*
Uses: *The plants* can be used for its beautiful flower heads in shallow water.
Sagittaria sagitifolia L. [Alismataceae]; An aquatic herb, lamina sagittate raising above the water surface.
Local name: Tir mukhi
Exsiccatae: *Saha and Datta 121*
Uses: Tubers are consumed as vegetables by local tribe.
Scoparia dulcis L. [Scrophulariaceae]; Erect herb, branching glabrous or slightly hairy, leaves simple, opposite or ternately whorled, elliptic, tapering at the base into a short petiole, flowers small, white, axillary.
Exsiccatae: *Saha and Datta 118*
Uses: The whole plant used for stomach ache, kidney stones, kidney problems.
Spilanthes paniculata Wall. *ex* DC. [Asteraceae]; Annual herb, leaves opposite, ovate crenate, heads yellow on long terminal peduncles.
Local name: Marhata Tiga.
Exsiccatae: *Saha and Datta 103*
Uses: Used in toothache.
Utricularia aurea Lour. [Lentibulariaceae]; A submerged aquatic herb, leaves many, submerged, divided into capillary segments, flowers yellow.
Exsiccatae: *Saha and Datta 156*
Uses: Nil

REFERENCES

Allen SD, FC Golet, AF Davis and TE Sokoloski, 1989. Soil-vegetation Correlations in Transition Zones of Rhode Island Red Maple Swamps. Biol. Rep. 89(8). Washington, DC: U.S. Fish and Wildlife Service.

Arber A, 1920. *Water Plants: A study of aquatic angiosperms*. Cambridge University Press. Cambridge, England.

Banerjee A and Matai S, 1990. Composition of Indian aquatic plants in relation to utilization as animal forage. *Journal of Aquatic Plant Management (USA)*.28: 69-73.

Biswas K and Calder C, 1936. *Handbook of Common Water and Marsh Plants of India and Burma.* Government Publications, Calcutta.

Boyd CE, 1968. Fresh-water plants: A potential source of protein. *Econ. Bot.,* **22** (4): 359-3.

Chaudhary S and Kumar R, 2011. Some important medicinal trees of district Bijnor. *Rece Res Sci Tech*.**3**: 96-100.

Cook CDK, 1996. *Aquatic and Wetland Plants of India.* Oxford: Oxford University Press. Pp.385.

Deb DB, 1981. 1983. *The Flora of Tripura State*, Vols.I and II. Today and Tomorrow's Printers and Publishers, New Delhi.

Fassett NC, 2000. *A Manual of Aquatic Plants.* Agrobiosis (India), Jodhpur.

Jain SK and Rao RR, 1977. *A Handbook of Field and Herbarium Methods.* Today and Tomorrow's printers and Publishers, New Delhi.

Jain SK, 2018. Glimpses of Indian ethnobotany, Oxford and IBH publishing Co, New Delhi, 1987. 231-241.

Kumar S, Das G, Shin HS, Kumar P and Patra JK, 2018. Diversity of plant species in the steel city of Odisha, India:Ethnobotany and implications for conservation of urban bioresources. *Brazilian archives of Biology and Technology*. **61**: 1-19.

Lacoul P and Freedman B, 2006. Environmental influences on aquatic plants in freshwater ecosystems. *Environ. Rev.* 14: 89-136.

Mahadkar S, Valvi S and Varsha Rathod, 2012. Nutritional assessment of some selected wild edible plants as a good source of mineral. *Asian Journal of Plant Science and Research*. **2**(4):468-472.

Maheshwari JK, 1960. The Origin and Distribution of the naturalized plants of Khandwa Plateau, Madhya Pradesh. *Journal of Biological Science*.**3**: 9-19.

Maltby E and Turner RE, 1983. Wetlands are not wastelands, Geogra manage LV. 92-97.

Marndi S, Mishra S and Mishra AK, 2020. Wetland flora of Odisha against skin infections. *Journal of Biodiversity and Conservation*. **4**(2): 328-340.

MAweb, 2005. Millennium ecosystem assessment, ecosystems and human well-being, A frame work for assessment http://www.MAweb.org

Mitsch WJ, Gosselink JG, 1993. Wetlands, 2nd ed. John Wiley, New York

Ong GH, Yap CK, Maziah M and Tan SG, 2011. Heavy Metal Accumulation in a Medicinal Plant Centella asiatica from Peninsular Malaysia. *Journal of Biological Sciences*. **11**(2): 146-155.

Reid, G. K. 1961. Ecology of Inland Waters and Estuaries. Reinfold Publication Corporation, New York.

Subramanyam K, 1962. *Aquatic Angiosperms*. Botanical Monograph (3) CSIR, New Delhi.

Umar KJ, Hassan LG, Dangoggo SM, Ladan M J, 2007. Nutritional Composition of Water Spinach (Ipomoea aquatica Forsk.) Leaves. *Journal of Applied Sciences*. **7**(6):803-809.

Vasu K, Jakku VG, Suryam A and Charya SM, 2009. Bimolecular and photochemical analysis of three aquatic angiosperm. *African Journal of Microbiology Research*. **3**(8): 418 -421.

How to cite this article

Moumita Saha, 2021. Diversity of wetland plants of Tripura. *Bioscience Discovery*, **12**(2):48-53.
Google Scholar citation: https://scholar.google.co.in/citations?user=vPzEyC8AAAAJ&hl=en