



# Nature Trails

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e-Newsletter of the Department of Botany, Dudhnoi College and  
Alumni Association of Botany Department, Dudhnoi College

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## **Principal's Message**

It gives me immense pleasure that the Alumni Association of Botany Department of Dudhnoi College is going to publish a newsletter. I hope the newsletter will focus the activities of the ex-students of the Botany Department of Dudhnoi College.

*~ Dr Lalit Chandra Rabha*



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**From**  
**Prof. Partha Pratim Baruah**  
*Director*

**Date: 21/01/2023**

**A message**

At the outset, I would like to quote by Clay P Bedford “You can teach a student a lesson for a day; but if can teach him to learn by creating curiosity, he will continue the learning process as long as he lives”. The curiosity generated by the committed teachers of the Department of Botany, Dudhnoi College has been reflected today in the activities of the alumni of the Department. They have shown their prodigious talents in their respective fields. It is really a matter of pride for the Department that within a year of formation of the Alumni Association of Department of Botany, Dudhnoi College, the past students have expressed their solidarity to make the College proud by taking an initiative to publish one e-Newsletter to disseminate the information on recent development(s) in Plant Sciences in the country as whole and in North Eastern Region in particular. These Alumni are not only Department’s loyal supporters, but also the true ambassador of the Department and the College as well. Through their activities and actions, they have taken responsibility to introduce their college into their professional and social networks. It is really commendable. I appreciate the spirit of the Alumni Association and wish all success in these innovative ventures.

(Partha Pratim Baruah)

## **From the HoD cum Advisor's Desk**

Dudhnoi College is a leading higher educational institution of Assam catering to the academic needs of thousands of students every year. It was established in 1972 with the arts stream only. The science stream was incorporated in 1985. The college is shouldering responsibilities for opening avenues for its students through which they can obtain postgraduate degrees in different subjects, have an all round development of their personality and make a respectful living after graduation. With this thought in mind, Dudhnoi College has taken initiative to launch different programmes like seminars, workshops, training programmes, certificate courses etc. on knowledge expansion, value addition and skill development of its students, which are organized by different departments of the college at different time. As a part of this great initiative department of Botany, Dudhnoi College has already organized two certificate courses on 'Vermicomposting' and 'Mushroom Cultivation' from 26<sup>th</sup> June to 9<sup>th</sup> July, in 2022. Total 62 (sixty two) participants coming from Dudhnoi, its neighbouring areas, Kamrup district and Meghalaya including our college students and some college employees made the programme a grand success.

At the initial stage the laboratory facility and infrastructure of the whole science stream of the college was far from satisfactory. Recently, with financial assistance (funding) of Rashtriya Uchchar Shiksha Abhiyan (RUSA), along with the other departments, the department of Botany also has become sufficiently equipped and students of the department have got benefited in performing practical of all papers comfortably and smoothly.

During the year 2014-15, the department planted a considerable numbers of seedlings of some selected valuable plant species in the college campus under a one year project entitled "sensitization on Biodiversity and climate change" which was sponsored by "Assam Science Technology and environment council" under the supervision of Dr. Dipali Deka (co-ordinator). The department has been maintaining a herbarium with almost 500 collected plant species, which is named as "Dudhnoi College Herbarium".

Department of Botany in collaboration with Jawaharlal Nehru College, Boko organized in the past outreach programmes for the benefit of the honours students several times on topics like, 'Micro-propagation', 'Tissue Culture', 'Genetic Engineering Techniques and Application' etc.

For creating an environmental awareness among the students, the department organized a one day workshop with two sessions on 29<sup>th</sup> November, 2022, the theme of which was 'Biodiversity Conservation and Sustained Utilization: North-East Indian Perspective'. Professor Nilakshee Devi of the Department of Botany, Gauhati University was invited as resource person in the programme. In the first session, she shared her vast knowledge in the theme with our honours students. In the second session, the topic of discussion was 'Field work and Herbarium Technique' and the interaction of our honours students with the resource person was very engaging.

Honours students maintain an annual hand-written wall magazine namely 'Plantarum' under the guidance of a teacher-in-charge of the department. The students of the department have been given a chance to showcase their latent creative power through writing articles, drawing pictures etc. in this wall magazine. Besides attending classes and performing

practical, the students of the department are given an opportunity to participate in certificate courses, workshops and seminars etc. organized by the department.

The department has been maintaining a “Medicinal Plants’ Garden” consisting of more than 150 plant species since 2003. Along with the medicinal plant species, more than 100 potted ornamental plant species are also maintained by the department very sincerely. Inside the medicinal plant garden, there is a small concrete water tank in which alive hydrophytic macrophytes and algal species necessary for practical works are conserved.

There is a small ‘Orchid House’ cum “Ethnobotanical Museum” where the department is planning to preserve carefully more and more species of orchid and varieties of ethnobotanical implements.

The department is planning on implement some extension activities in this academic year to fulfil the departmental social responsibility programme. As a part of this programme recently, the department has adopted a village namely ‘Uportola-Kacharipara’, 5 kilometres away from the college towards northern side. Along with that village, the department has also adopted a LP School of that locality namely ‘Uportola Bathou Prathamik Vidyalaya’ for socio-economic development of the village.

A majority of the people of the adopted village and its neighbouring areas are of economically very poor background. Therefore, the department is interested to extend its support to the people of the village in developing certain skills so that they can earn their livelihood with a negligible investment. Considering this fact, department of Botany organized a one-day training programme on ‘Mushroom Cultivation” for villagers and farmers of the adopted village on 21<sup>st</sup> December, 2022 in collaboration with Krishi Vigyan Kendra, ICAR, Goalpara. On the same day the department also organized two another programmes simultaneously like-

- An ‘Awareness camp on Natural Farming’ and the same group of people participated in this programme.
- ‘Swachhta Pakhwada’ programme was also celebrated by the faculty members, employees and students of the department along with the scientists coming from KVK, Goalpara and inhabitants of the adopted village.

On 20<sup>th</sup> December, 2022, the department organized a programme in the adopted school, i.e. ‘Uportola Bathou Prathamik Vidyalaya’ the theme of which was ‘Popularisation of Science’. The usage of three kinds of microscopes viz ‘Simple microscope’, ‘Compound microscope’ and ‘Electric microscope’ was demonstrated among the students and they enjoyed the programme a lot.

The Alumni Association of the department of Botany was constituted on 29<sup>th</sup> May 2022. Till the year of establishment, i.e. 1985, the department of Botany has been serving the students of the institution with utmost dedication. The students of the department (outgoing as well as studying) also actively and sincerely participate in all events arranged by the college or by the department.

Recently the Alumni Association of the department has taken initiative to publish an e-newsletter which is aimed at updating knowledge of the students and persons involved in the study of Botany, creating an environmental awareness in the society and promoting the study habit as well as creative power of the students. To achieve the goal, publication of different issues of the e-newsletter at proper time will be made without interruption.

The Department of Botany, Dudhnoi College is committed to holistic development of the institution and vicinity of Dudhnoi.

*~Dr. Dipali Deka*

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## **Editor's Page**

*~Shahadev Rabha*

**E**arth is the only known green planet in the universe, where life exists. The earth is green because of plants. It is estimated that there are about 3,70,000 identified plant species on the planet earth and many more are yet to be identified. Out of the total estimated identified plant species, about 300,000 species are Angiosperms, about 1,100 species are Gymnosperms, about 12,000 species are Pteridophytes, about 10,000 species are Bryophytes, and about 44,000 species are Algae. Two-thirds of the total plant species are found in tropical regions.

According to an estimate, there are about 45,000 identified plant species in India and more than one lakh plant species are still not identified.

Plants are the fundamental life forms on the earth, on which all other living organisms depend directly or indirectly. Plants are the main component of biodiversity. It is impossible to determine the number of individual plants on the earth; however, a study published by Nature journal estimated that there are only about 3 trillion trees, i.e., about 400 trees per human.

According to the Global Tree Assessment report, nearly one-third of the species are threatened with extinction. Nearly one-fourth of all plant species on the earth is under threat. National Science Foundation-funded research published in the journal Science Advances reports that about 40% of global terrestrial plant species are very rare and most of which are at risk for extinction.

Our state of Assam, which lies in the Indo-Burma biodiversity hotspot, has its own threatened list of seven plant species as per the Assam State Biodiversity Board. These plant species are under threat perception on the IUCN Red List of Threatened Species are not strongly protected under the Wildlife (Protection) Act. The threatened plant species of Assam include Cathcart's Magnolia, Griffith's Magnolia, Magnolia, Siya Nahar, Lady's Slipper orchid, Lanceleaf Vatica and Cycas.

Hollong (*Dipterocarpus retusus*), which is the state tree of the Indian state of Assam and Arunachal Pradesh, has most recently been assessed for the IUCN Red List of Threatened Species in 2017 and listed as Endangered species.



*Dipterocarpus retusus* (source: internet)



Why plant species are going extinct at such an alarming rate? Although extinctions occur naturally, the current species extinction rate is estimated thousand times higher than the natural extinction rates. Habitat loss due to destructive anthropogenic activities are the primary cause of higher extinction rates. Loss of genetic variation is another reason for species extinction. Climate change is considered to be a reason and going to affect adversely in the near future.

Therefore, it is high time to realize destructive human activities, create awareness and work to save Mother Nature.

I hope that “Nature Trails” will definitely provide a platform for the students and also other people to raise their voices for the environment.



Hollong (*Dipterocarpus retusus*), the state tree of Assam (source: internet).

## **An Insight to Some Recent Significant Findings in Floristic Studies of Assam**

**Dr Dipali Deka**

*Associate Professor and HoD, Dept of Botany, Dudhnoi College*

As a part of Indo-Burma biodiversity hotspot, Assam is blessed with rich biological diversity. This region houses several species of rare, endangered and endemic flora and fauna. The physical features and climatic conditions of Assam have resulted in a diverse range of ecosystems which include wetlands, hills, grasslands, forests etc. All of these are habitats for a diverse range of floral and faunal species. A considerable number of researchers have documented the hidden biological wealth of Assam to a greater extent. Still several biologists have been doing continuous explorations to uncover the hidden knowledge on biodiversity. Among the women researchers and workers in the field, Professor Nilakshee Devi is a well-known researcher as well as research guide of plant science in Assam. She has been doing systematic investigations on plants in various parts of Assam. She has published more than 60 research papers in International and National journals. Professor Nilakshee Devi along with her research scholars have made significant contributions towards plant science by discovering plant species new to science and reporting new distributional records for several plant species. An extensive study on the genus *Syzygium* Gaertner (1788: 166) was conducted by her team and discovered *Syzygium namborensense* as a new species from the Nambor Reserve Forest, Assam, India in the year 2022. *Syzygium namborensense* resembles *Syzygium nervosum* in having glabrous, chartaceous and aromatic leaves, paniculate inflorescences with second order branching, calyptrate flowers, numerous stamens and equal number of petals in the calyptra but differs from it in having more compressed branchlets with shorter nodes and greater number of leaves, shorter acumen, strictly elliptic leaves with acuminate apex and cuneate base, greater number of lateral veins, intramarginal vein uniform along the blade, sessile yellowish white flowers with obconical hypanthium and a higher number of ovules per locule.



*Syzygium namborensense*

Under her leadership recollection of *Ceropegia lucida* a luminous lantern flower from Assam was done after a prolonged gap of 145 years. In a recent floristic survey to the Golaghat District, Assam, during the period from August to October, 2018, they came across many interesting plant species. On consultation with the existing literature and herbarium specimens deposited at KEW and CAL, one of the specimens was confirmed as *Ceropegia*

*lucida* Wall. According to the Flora of British India, Vol. IV. and herbarium specimen, R.L. Keenan had collected this plant from the Cachar District of Assam in June, 1874. Till then it was neither collected nor reported from anywhere within the state. Barbhuiya in 2013 categorized it as “Regionally Extinct” after being unable to locate it in its site of occurrence.



*Cerpegia lucida*



*Sterculia striatiflora*

Approximately 58 species make up the monogeneric Aponogetonaceae (freshwater aquatic plants) family, which is primarily found in tropical and subtropical regions of Africa, Asia, and Australia. There are only eight species of the genus Aponogeton Linnaeus f. (1781) known to exist in India, four of which are endemic. Aimée Antoinete Camus first described the species *Aponogeton lakhonensis* A. Camus in 1909 based on a collection that F.J. Harmand had made from Mount La-khon, Laos, in 1875. It is the only species known to exist in central and eastern India. Often, this species has been incorrectly labelled as *Aponogeton natans* (L.) Engler & Krause (1906). Hence a comparative analysis between both the species has been made by Prof. Devi and her team. This species was first discovered in India in 1836 by an unidentified collector from Assam, and it was rediscovered in 1898 by M.A. Hock from Jaboka in the Sibsagar district of Assam. Since those two collections, there have been no more sightings or reports from the rest of the country, making it a regionally threatened plant species. The researchers collected an incredibly stunning aquatic plant with fat leaves and a yellow inflorescence during a recent botanical trip to the Dhemaji area of Assam in 2020–2021. The aquatic plant was identified as *Aponogeton lakhonensis* A. Camus by consultation with the existing literature. On the basis of the existing literatures and herbarium specimens, it can be concluded that only two collectons of *Aponogeton lakhonensis* have been made so far from India (viz. in 1836 and in 1898). The present sighting of *A. lakhonensis* is a rediscovery of the species from India after 123 years. The plant has been located from the Poba Reserve Forest of Dhemaji district, Assam making it a new report of occurrence apart from the previous two localities in Assam.

New geographical distributional records of three species of the genus *Blumea* were recorded by Prof. Devi from Assam. Again, existence of *Sterculia striatiflora* Mast in the state of Assam was reported for the first time by her.

In several publications it is found that emphasis is laid on strengthening the research in taxonomy of biodiversity. But practically it has been observed that taxonomic research in our country as well as in our state is greatly neglected despite its megadiversity status for which it is declining. The major causes of this decline may be

- There is no coordination of inter and intradiscipline among the research groups.

- The research works are confined to some specialized research organisation or some universities.
- Poor funding and lack of suitable jobs.

So, there is great need to increase the number of taxonomic researchers and reprioritize the focus on neglected taxonomic groups, modern approaches in taxonomy, networking of conservation agencies and modern approaches in bioprospecting programmes which will provide a better future of biosystematics in Assam. It is important to increase publication of identification manuals and dedicated journals, increase funding, conducting short-term training programmes in taxonomy and improving identification services.

This article is prepared with an expectation that such investigation done by Dr. Devi and her research scholars will encourage the researchers, specially the women researchers of future generation to work in the field of systematic study in a biodiversity rich state like Assam.

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## **Few Endangered Indigenous Fruits of Assam**

*Anuradha Rabha*

*Guest Faculty and Alumni, Dept. of Botany, Dudhnoi College*

Nature has provided everything we need in the ocean world. All animals depend on nature. Nature has been providing all the necessary resources for the animals without sparing the slightest. But with increasing habitat fragmentation and destruction due to deforestation, developmental activities, shifting cultivation, poaching, trade in wild flora and fauna, the introduction of exotics and rapid wild spread of invasive species are becoming some major concerns for the conservation of these natural resources. Therefore, I would like to introduce you to some of the Assamese fruits that are unfamiliar to many of us. It may have different names from place to place. 1) **অমৰা (Hog Plum)** *Spondius pinnata*: The fruits have a sour taste and can be eaten raw or made into jams, jellies, or juices. They can also be used as feed for pigs (hence the common name "hogs plum"). 2) **কৰ্জা টেঙা (Karanda, Bengal currant)** *Carissa carandas*: It is rich in iron, vitamin C, vitamins A, calcium and phosphorus. The mature fruit is harvested for pickles. It contains pectin and accordingly is a useful ingredient in chutney. 3) **টেপৰ টেঙা (Sour mangosteen, false mangosteen)** *Garcinia xanthochymus*: The fruit is edible, it is a pleasant acid taste and is mainly used as a breakfast fruit. It is also used for jam, curries and pickles. Latex is sometimes used in dyeing. 4) **হলফুলিলৈ টেঙা (Star gooseberry)** *Phyllanthus acidus*: The fruit is eaten fresh and is sometimes used as a flavouring for other dishes, it is generally regarded as too tart to eat by itself in its natural form and is processed further. It is candied in sugar or pickled in salt, and used in chutney, relish or preserves. 5) **পনিয়ল (Indian coffee plum, or scramberry)** *Flacourtia jangomas*: Fruits are widely eaten around South Asia, both raw and cooked. They are noted for their mild sour and tangy taste. The fruits are pickled, salt-dried or cooked in Indian curries. They can also be blended into juices or made into jams and marmalades which are immensely popular in Southern India. 6) **নেউৰী টেঙা (Indian red Pear, Mir tenga)** *Protium serratum*: A large tree generally predominant on foot hills of lower Assam. Fruit is a drupe, bright pink when ripe, and very acidic. The sour ripe fruits are eaten fresh.



*Spondius pinnata*



*Carissa carandas*



*Garcinia xanthochymus*



*Phyllanthus acidus*



*Flacourtia jangomas*



*Protium serratum*

## **Forest Man of India**

*Punam Rabha*

*6<sup>th</sup> Sem. Botany (Hons.), Dept. of Botany, Dudhnoi College*

**J**adav Molai Payeng was born on 31 October 1959 in the Jorhat district of Assam. He is an Environmental activist and forest worker from Majuli, popularly known as the Forest Man of India. He has done a great service to humankind by working towards saving the environment.

Jadav Molai Payeng has planted and tended trees on a sandbar of the river Brahmaputra turning it into a forest reserve. The forest is called Molai forest after him. It is located near Kokilamukh Jorhat and encompasses an area of about 550 hectares. The forest man of India has spent 30 years of his life planting around 40 million trees to create a real man-made forest by changing a barren sandbar of the Brahmaputra, which is known as the Molai forest. In 1979, Payeng encountered a large number of snakes that had died due to excessive heat after floods washed them onto the tree-less sandbar. So he planted around 20 bamboos seeding on the sandbar. In October 2013, he was honoured at the Indian Institute of Forest Management during their annual event coalescence.

In 2015, he was honoured with Padma Shri, the fourth-highest award in India. He was awarded the honorary doctorate from Assam Agricultural University and Kaziranga University for his contribution. In 2018, he was honoured with Jingle Kide Annual Award. He received the Anandaram Borooah Academy award in 2019. He was honoured with the Point of Light Award commonwealth in 2020. Padma Shri Jadav Payeng was also honoured by the school of Environmental Science at Jawaharlal Nehru University on 22nd April 2012 for his remarkable achievement.

In December 2022, Forest Man of India Jadav Payeng visited Mexico and took one lakh beetle-nut plants with him. He has planted the trees on 8 lakh hectares of land in Mexico. The main reason to visit Mexico was to build an artificial green forest in Mexico. Many people come together to destroy the forest, but a single person, if determined, can establish a new forest. He said that every child should plant a tree and take care of it until they leave school.



Jadav Molai Payeng (Forest Man of India)

## **My Way of Remembering Scientific Names**

*Rupathi Khakhalary*

*Alumni of Botany Dept., Dudhnoi College, Batch 2017-2020*

According to me, as a biology student, one of the toughest tasks is remembering those long complicated scientific names. During my 1st year of study, I found myself struggling so much in remembering various scientific names. Since I'm an introvert, I don't dare to approach my teachers for help. I used to write all the scientific names and glued them on the wall in front of my reading table. That is the only way I could manage remembering scientific names.

After graduation, I enrolled myself on a People's Biodiversity Register training course. There I met friends from different places who were smart and talented. One winter day while we were eating jujube, suddenly my friend asked me the scientific name of the jujube fruit and I was unable to answer it because I have neither used nor heard the scientific name of jujube. I said to her that I don't know. After that, we talk about scientific names being hard to memorize and how we struggle to remember them during exams. Then a friend taught us a technique he uses each time. He said that whenever we look at our surroundings, walk or eat something we should not think about their common names but their scientific names. For example, if I am walking on the road and I see a Sal tree I should think like oh this is *Shorea robusta*, not Sal and if I am eating rice I should think that I am eating *Oryza sativa* with *Cajanus cajan*, *Solanum tuberosum*, *Brassica oleracea*, *Allium cepa* and *Tabasco pepper*. He told us to practice it for 2 to 3 days and I did practice, then the result was spellbound.

Whenever I eat or walk I would always remind myself that this tree's scientific name is this, this flower's scientific name is this and if I don't know I would search it on Google. After 3 days my friend again asked me the scientific name of jujube and that time I proudly said *Ziziphus*.

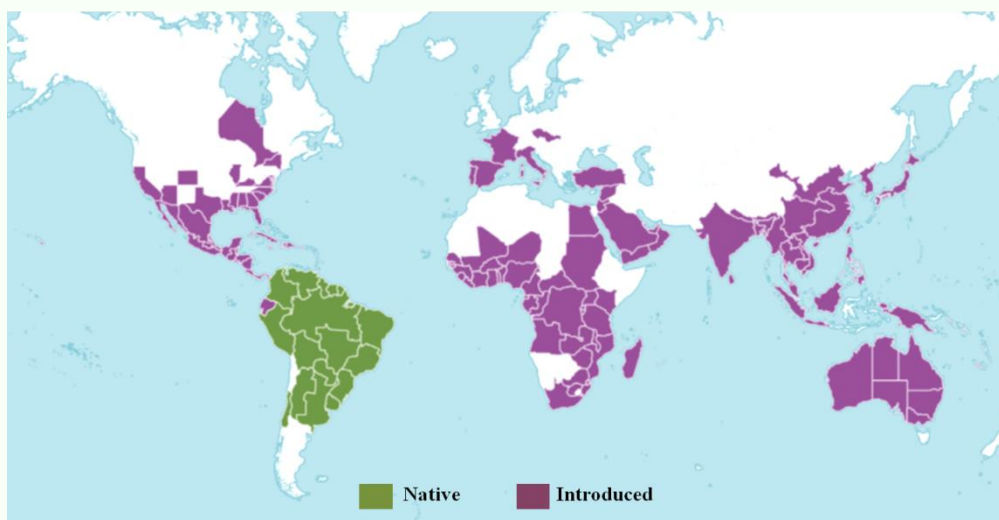
If someone is struggling with the same problem in remembering the scientific names, then they can surely use these techniques which I found the most effective.

## ***Pontederia crassipes* Mart. – An Invasive Plant Species**

**Kuldeep Daimary**

*Alumni of Botany Dept., Dudhnoi College; Phone: 8638670410*

*Pontederia crassipes* Mart. commonly known as water hyacinth is a freshwater aquatic plant species, belonging to the family Pontederiaceae. This fast-growing, free-floating, perennial plant is indigenous to South America. It was introduced as an ornamental species to embellish the water bodies, in many countries for its attractive blue or purple flowers, and oblong to oval glossy leaves with bulbous petioles. But, later this plant was discovered to be an invasive species (i.e. any non-native species that significantly modify or disrupts the ecosystem it colonizes). This plant propagates itself abundantly through stolons as well as by seeds, for its adaptability to a wide range of freshwater ecosystems. Now, this terrifyingly proliferating, sturdy plant species has emerged as a major weed interfering with anthropogenic activities and causing economical and ecological losses. For its unprecedented dramatic effects, it is listed in the quarantine list in many countries. It has been identified by International Union for Conservation of Nature (IUCN) as one of the 100 most cumbersome invasive species (Teñlez et al. 2008).



Geographical Distribution of *Pontederia crassipes* Mart. (Source: KEW POWO)

*P. crassipes* has now invaded Asia, Europe, Africa and North America (Shanab et al. 2010), for this, it has been the subject of a global reflection because due to its rapid spread and development, it is at the origin of the difficulties encountered in the irrigation and life in an aquatic environment.

In India particularly in Assam, we observe a lot of damage to the environment and local economy caused by water hyacinth pollution of lakes, rivers and ponds. This invasive weed poses multiple hazards ranging from socio-economic to ecological. It tends to endanger biodiversity, cause eutrophication, shelter pests, clog fresh waterways, affect agriculture and aquaculture, and hamper shipping and recreational activities.



However, its infestation can be controlled by physical, chemical and biological methods of control which prove to be better adapted to sustainable management. Recently, it has been envisaged that successful utilization of this weed can solve the problems associated with them.



*Pontederia crassipes* Mart. invasion in water bodies of Goalpara, Assam, India

It is being speculated that the huge biomass can be used in wastewater treatment, heavy metal and dye remediation, as a substrate for bioethanol and biogas production, electricity generation, industrial uses, human food and antioxidants, medicines, feed, agriculture and sustainable development. Towards this quest, many approaches have been undertaken and partial success has been achieved. If harnessed properly, these control methods can solve many of the issues our society faces now. Along with these methods, there is an urgent need to reflect on its promotion, including its popularization, which will offer the populations of the areas concerned opportunities and impetus towards a change in pro-environmental behaviour in the management of national heritage.

## Aquatic Algae of Dudhnoi College Campus

Soumin Nath

Assistant professor, Department of Botany, Dudhnoi College

Dudhnoi College is situated on the south bank of the mighty Brahmaputra River. The college has a pristine green campus covering a total area of about 100 bighas of land. The college campus is rich in biodiversity as it encompasses more than 150 species of woody plants, more than 100 species of medicinal plants (herb & shrub) and several species of birds, reptiles etc. Within the campus, there is a “U” shaped pond around the administrative building. The pond is utilized for aquaculture. The pond harbours several species of indigenous as well as some economically beneficial hybrid fish species. As algae are the primary producers of any aquatic ecosystem, the entire aquatic food chain is dependent on algae for nutrition. But no information is available on the algal flora of the Dudhnoi College campus. So, a preliminary study was conducted to explore algal flora from the pond of the Dudhnoi College campus from January to June 2022. Algal samples were collected from the “U” shaped pond by filtering technique using plankton net of mesh size 25µm. Collected algal samples were preferably analysed freshly under a compound microscope and photomicrographs were taken with the help of a digital camera. The remaining algal samples were preserved by Lugol’s Iodine and 4% formalin solution for further investigation. Algal specimens were identified by accessing standard literature and monographs (Desikachary, 1959; John *et al.*, 2005; Das & Adhikary, 2014; Das & Keshri, 2016). A total of 38 algal species belonging to Bacillariophyta (4), Charophyta (23), Chlorophyta (7), Cyanobacteria (3), and Ochrophyta (1) were recorded during the exploration period. Recorded algal species were systematically arranged (table 1) following Ruggiero *et al.*, 2015.

**Table 1:** Algal species recorded from Dudhnoi College campus.

Phylum	Family	Species
Bacillariophyta	Aulacoseiraceae	<i>Aulacoseira granulata</i> (Ehrenberg) Simonsen
	Cymbellaceae	<i>Cymbella tumida</i> (Brébisson) Van Heurck
	Diadesmidaceae	<i>Diadesmis confervacea</i> Kützing
	Ulnariaceae	<i>Ulnaria delicatissima</i> (W.Smith) Aboal & P.C.Silva
Charophyta	Closteriaceae	<i>Closterium closterioides</i> (Ralfs) A.Louis & Peeters
		<i>Closterium ehrenbergii</i> Meneghini ex Ralfs
		<i>Closterium kuetzingii</i> Brébisson
		<i>Closterium rostratum</i> Ehrenberg ex Ralfs
	Desmidiaceae	<i>Actinotaenium cucurbitinum</i> var. <i>minutum</i> (Prescott) Tomaszewicz
		<i>Bambusina borneri</i> (Ralfs) Cleve
		<i>Cosmarium botrytis</i> Meneghini ex Ralfs
		<i>Cosmarium forceps</i> Brühl & Biswas
		<i>Cosmarium impressulum</i> Elfving
		<i>Cosmarium lundellii</i> Delponte
<i>Cosmarium porteanum</i> W.Archer		

		<i>Cosmarium regnesi</i> Reinsch
		<i>Cosmarium undulatum</i> Corda ex Ralfs
		<i>Euastrum ansatum</i> Ehrenberg ex Ralfs
		<i>Euastrum denticulatum</i> var. <i>quadrifarium</i> Willi Krieger
		<i>Euastrum sinuosum</i> var. <i>scrobiculatum</i> (Nordstedt) Willi Krieger
		<i>Micrasterias pinnatifida</i> Ralfs
		<i>Pleurotaenium ehrenbergii</i> (Ralfs) De Bary
		<i>Staurastrum margaritaceum</i> Meneghini ex Ralfs
		<i>Staurodesmus megacanthus</i> (P.Lundell) Thunmark
		<i>Staurodesmus octocornis</i> (Ehrenberg ex Ralfs) Stastny, Skaloud & Neustupa
		<i>Staurodesmus unicornis</i> var. <i>gracilis</i> (M.O.P.Iyengar & Vimala) Teiling
		<i>Teilingia granulata</i> (J.Roy & Bisset) Bourrelly
Chlorophyta	Hydrodictyaceae	<i>Stauridium tetras</i> (Ehrenberg) E.Hegewald
		<i>Stauridium tetras</i> var. <i>tetraodon</i> (Corda) J.D.Hall & Karol
	Scenedesmaceae	<i>Desmodesmus abundans</i> (Kirchner) E.H.Hegewald
	Selenastraceae	<i>Ankistrodesmus densus</i> Korshikov
		<i>Kirchneriella diana</i> (Bohlin) Comas
		<i>Monoraphidium circinale</i> (Nygaard) Nygaard
		<i>Monoraphidium indicum</i> Hindák
Cyanobacteria	Microcoleaceae	<i>Oxynema acuminatum</i> (Gomont) Chatchawan, Komárek, Strunecky, Smarda & Peerapornpisal
	Oscillatoriaceae	<i>Oscillatoria tenuissima</i> C.Agardh ex Forti
	Spirulinaceae	<i>Spirulina major</i> Kützing ex Gomont
Ochrophyta	Sciadaceae	<i>Centrtractus belonophorus</i> (Schmidle) Lemmermann

The findings of the present study revealed that the pond located at the Dudhnoi College campus is rich in algal flora. Members of the phylum Charophyta (23) were found to be dominant followed by Chlorophyta (7), Bacillariophyta (4), Cyanobacteria (3) and Ochrophyta (1) respectively. According to several algologists, the dominance of desmids (members of the phylum Charophyta) indicates the healthier nature of any water body. So, the algal community of the “U” shaped pond of Dudhnoi College justifies its pollution-free pristine environment.

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## **Researchers from the Botanical Survey of India (BSI) Discovered Indian Lipstick Plant in Arunachal Pradesh**

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North-East India is the easternmost region of India representing both a Geographic and political-administrative division of the country. Of the Total forest area of around 68 million hectares in India, the Northeastern states account for over 17 million hectares, roughly one-fourth of the forest area of the Country. An ethnically diverse state Arunachal Pradesh spread over 83,743 square km area and sharing a 1,129-km border with China is one of the 12 biodiversity hotspots of the world.

The researchers of the Botanical Survey of India have rediscovered the Indian Lipstick Plant (*Aeschynanthus monetaria* Dunn) after 100 years in Chipru and Hayuliang regions in the Anjaw district of the state of Arunachal Pradesh.

The British Botanist Stephen Troyte Dunn identified this species in 1912 based on plant samples gathered from Arunachal Pradesh English botanist Isaac Henry Burkill.

In December 2021 Chawlu during his research on the flower of Anjaw district in Arunachal Pradesh from Hayuliang and Chipru collected some samples of *Aeschynanthus*. According to him from documents and fresh samples, it became clear that these samples are from *Aeschynanthus monetaria* Dunn which since 1912 has never been seen in India.

The scientist of Arunachal Pradesh Regional Centre of Botanical Survey of India has said that due to the appearance of the tubular red corolla, some of the species of the genus *Aeschynanthus* are dubbed Lipstick plants.

Indian Lipstick Plant grows in moist and evergreen forests at a height of 543 to 1134 metres. The flowering and fruiting time of this plant is between October to January. The International Union for Conservation of Nature (IUCN) has placed the lipstick plant species in the 'endangered' category.



*Aeschynanthus monetaria* (source: internet)

## **Bioluminescent Mushroom in Meghalaya**

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**A** new species of mushroom was found in the Northeastern region of Meghalaya state. The forest of North East is a treasure of diverse plant species and now scientists have discovered a new variety of mushrooms. More than 600 varieties of mushrooms were found in the dense forest of Meghalaya and because of its light-emitting nature, the newly found species has been named *Roridomyces phyllostachydis*.

The species named *Roridomyces phyllostachydis* was first sighted in August near a stream in Meghalaya Maylynong in East Khasi hills and later at King Suri in East Jaintia hills. The reason behind the bright mushroom is a phenomenon of living organisms that emits light of their own called bioluminescence. It is the first time that such a mushroom is found in India.

According to scientists, bioluminescent organisms were primarily found in the ocean, so it is extremely a very rare case that such a species is found on land. According to scientists the mushroom found in Meghalaya were grown on dead bamboo. In the daytime, it looks ordinary but at night it starts emitting light which looks extremely fascinating. Now it is among the 97 known species of bioluminescent mushrooms in the world.



Bioluminescent mushroom (source: internet)

## **Science – the Only Tool to Fight Climate Change, the Wrath of Nature**

***Basistha Rabha***

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Climate change is possibly the biggest threat all the life forms on earth including the human race are facing after the events such as the K-T extinction and Ice-age which wiped out a large number of species from the face of the Earth. Of all the problems climate change is causing, one big challenge is the rise in the sea level. Due to this more and more places around the world are struggling with sea-water inundation - where salt water from the sea is flooding further inland and destroying crops which can't cope with the increased salinity. Whereas, the rate of increase in population is found to be nowhere near declining. Rice, which is arguably the most important food crop on earth, is one of the worst affected crops. It is the main carbohydrate source as well as the main food source and is relied on by over 3.5 billion people every day. So, this is a major crop in many countries, mainly in Asia. In some countries like Vietnam, Malaysia and Thailand it is becoming harder and harder to grow due to increase in the sea-water interference.

However, findings from the University of Sheffield's Institute for Sustainable Food have revealed that genetically modifying rice to reduce the number of stomata it has, makes it more salt-resistant. Stomata are openings that most plants have which regulate carbon dioxide uptake for photosynthesis, along with the release of water vapour. The scientists from the University of Sheffield revealed that reducing the number and size of stomata of rice plants has allowed them to use up to 60 per cent less water, thus making them hardier and drought tolerant thus becoming more beneficial in places prone to drought.

The findings also reveal that developing high-yielding rice varieties which use less water can withstand multiple abiotic stresses which will be critical for maintaining future global food security. Those findings, combined with these new results, published in the *New Phytologist*, report that rice can be adapted to survive in much more harsh environments and weather conditions which are becoming more unpredictable due to climate change, which will ultimately help in tackling food insecurities and possible famines around the globe. However, the researchers also discovered that reducing the number and size of stomata could make rice harder to grow in extremely hot temperatures. As a result, to make sure that rice can grow as effectively as possible in different countries and environments, different modifications will need to be made. For example - rice with fewer, larger stomata, could be better suited to growing in extremely warm temperatures.

The researchers from the University of Sheffield, working alongside the High Agricultural Technology Research Institute (HATRI) in Vietnam, studied 72 rice varieties, of which both natural and genetically modified varieties were used. The researchers are also trying to find ways to modify rice varieties with smaller and fewer numbers of stomata which can survive with less water and in places with salt water and thus make them hardier and grow more effectively in every possible climate. There are also some natural rice varieties which have fewer, bigger stomata and can thrive in hotter temperatures. They are now planning and investigating whether they can produce new dwarf rice varieties, which produce the highest crop yields, with even more heat-resistant attributes.

## Photographs of Various Activities Organized by Department of Botany, Dudhnoi College



Certificate Course on Vermicompost and Mushroom Cultivation



One-Day Workshop on Biodiversity Conservation



Vermicompost Unit



Mushroom Cultivation Unit



Training on Mushroom Cultivation



Extension Activity at Upartola Bathou LP School



**Sri Sri Saraswati Puja at Dudhnoi College, 2023**

