

# Camellia

## Department of Botany

Dakshin Kamrup College

Mirza-781125 ♦ Estd : 1961

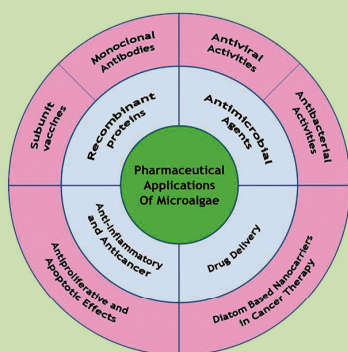
DAKSHIN KAMRUP COLLEGE, MIRZA

দক্ষিণ কামৰূপ মহাবিদ্যালয়, মিৰ্জা



Vol.-2 : 2022-23

### SPOTLIGHT



### Discovery of the Ultrasmall Microalgae *Medakamo hakoo*

Researchers from the University of Tokyo (March 2023) have uncovered a new species of microalgae, named *Medakamo hakoo*, during DNA analysis of water from a home aquarium. With its unique DNA sequence not found in any previous records, this species stands out as the smallest known freshwater green algae. Its remarkable ability to be stably cultivated at high densities opens up exciting possibilities for its use in producing valuable products for both food and industrial purposes. It contains only one mitochondrion and one chloroplast, which indicates that it is a green algae with extremely simple cell structure. Its cell cycle is strongly synchronized with the day and night cycle, which is key to effective, stable bio production. Due to these inherent qualities, *M. hakoo* can be effectively cultured at high cell density, making it possible to mass produce substances such as highly functional foods, cosmetics and biofuel at low cost.

### IN THIS VOLUME

Career Talk  
Snippets from the Plant World  
Faculty corner | Student Corner  
Quest | Departmental Buzz

### MESSAGE FROM HOD'S DESK

Greetings to all. We, the Department of Botany feel delighted to bring out Volume-2 of our departmental Newsletter titled "Camellia" which display various activities and achievements of our faculty and students. As the Head of the Department, I would like to offer my sincere thanks to all the faculty members, non-teaching staff and students for their limitless support and sincere efforts for the upliftment and development of the Department. On this occasion, I sincerely acknowledge and congratulate all the team members of the editorial board and also contributors for bringing up this issue in a current shape. The Department provides excellent academic environment with a team of highly qualified as well as experienced faculty members and necessary infrastructural facilities to support as well as inspire students in pursuit of academic excellence. Our students have exhibited a great zeal and enthusiasm in participating in various inter and intra college activities like seminars, workshops, placement programs, technical and cultural events etc. We tried to offer the most effective learning to all the students and committed to work hard for the students to achieve greater heights. In the coming days, we will mainly focus on holistic growth and overall development of students in the changing educational scenario as envisaged in NEP, 2020. I am quite optimistic the Department will go a long way in creating a niche in the society through collaborative approaches with different stakeholders. I also invite the readers of this mouthpiece for their valuable contribution and suggestions in the forthcoming issues.

**Dr. Durlav Nr. Singha**

### HIGHLIGHTS

- ◆ Hands on training on Organic Farming and Horticultural practices in Krishi Vigyan Kendra, Kahikuchi.
- ◆ Visit to ICAR, Borapani, Meghalaya for training in Horticultural experimental farming.
- ◆ Exposure of Laboratory to the staff and students of Herambore Senior Basic School as part of extension activity of the Department.
- ◆ An Interaction with the parents of the students perusing B.Sc. Botany as Honours subject and the faculty members.
- ◆ Survey on various Nurseries as part of the Skill Enhancement Curriculum.
- ◆ Participation in Cultural Rally on the occasion of College Week.
- ◆ Meeting with the members of the Botanical Forum.
- ◆ Inauguration of the Wall Magazine Botanicum.
- ◆ One Day Workshop on Career Opportunities with special reference to Botany Graduates.

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# FOCUS INDIAN FOREST SERVICE (IFS)

- It is one of the three All India Services of the Government Of India , the other two being IAS and IPS. The service implements the National Forest Policy in order to ensure the ecological stability of the country through the protection and participatory sustainable management of natural resources. The members of the service also manage the National Parks, Tiger Reserves, Wildlife Sanctuaries and other protected areas of the country.
- The services is under the Ministry of Environment , Forest & Climate Change of the Govt. of India.

## ELIGIBILITY

- The candidate must be an Indian Citizen.
- The candidate must have a Bachelors Degree in Science or Engineering with at least one of the following subjects :  
Animal husbandry & Veterinary Sc, Botany, Chemistry, Geology, Agriculture, Forestry, Mathematics, Statistics, Physics, Zoology.

## RECRUITMENT

- Officers are recruited through an open competitive examination conducted by the UPSC having Prelims exam, Mains exam and Interview.
- The selected officers are trained for about 2 yrs by the Central Government at Indira Gandhi National Forest Academy, Dehradun in a host of subjects like forestry, wildlife management, bio diversity, environment protection , climate change, forest policies and laws, remote sensing & GIS, forest dwellers, Scheduled tribes. After training the officers are awarded a Master's Degree in Science (Forestry) of Forest Research Institute.
- The services are placed under various state cadres and joint cadres and they have to serve both under State and Central Government.

## HOW TO BECOME A FOREST OFFICER

### ● Submit IFS exam application

Visit the UPSC website to access the online IFS exam application form. Include your personal details, contact details, the examination centre you want, signature, photo ID and the prescribed fee.

### ● Take the preliminary examination

Follow the UPSC instructions to appear for the preliminary examination. The exam is available in English and Hindi and consists of two papers with objective type questions.

### ● Clear the main examination

You can appear for the main examination after clearing the Prelims exam. It consists of a written exam and an interview. The written examination is in English only. It consists of six papers of the conventional essay type, with general knowledge and general english being compulsory and the four others that you can select from a list of optional subjects. These include botany, physics, chemistry, mathematics, statistics, geology, agriculture, agricultural engineering, animal husbandry and veterinary science, chemical engineering, mechanical engineering and civil engineering. If you score the minimum qualifying marks, the UPSC will invite you for an interview.

### ● Clear the personality test

A board of competent observers will interview you to assess your suitability for the IFS. They may ask questions related to your academic study and general knowledge questions about local, national and international events. The purpose is to have a meaningful conversation and discover your mental qualities such as intellectual curiosity, critical thinking, observation powers, judgment ability and mental alertness. They also want to find out if you are tactful, can take the initiative, are capable of leadership and have integrity. Understanding topography, appreciating nature and having an adventurous spirit can improve your selection chances.



Dimpi Bora of Nagaon Secures 10th Position in IFS, Assam



Indian Forest Service (IFS) Probationers undergo professional training at Indira Gandhi National Forest Academy, Dehradun



## PAY PACKAGE

Basic Pay ₹38,000-44,000 for junior scale  
&  
₹ 55,000-60,000 for senior scale.

## POSITION HELD

- District/Divisional Forest Officer (DFO)
- Conservator of Forest
- Chief Conservator of Forest
- Principal Chief Conservator of Forest (PCCF)- It is the highest rank of Officer belonging to the Indian Forest Service. At times, the state may have more than one post of PCCF and in that case, one of them is designated as the Head of Forest Force.



# SNIPPETS FROM THE PLANT WORLD (2022-23)

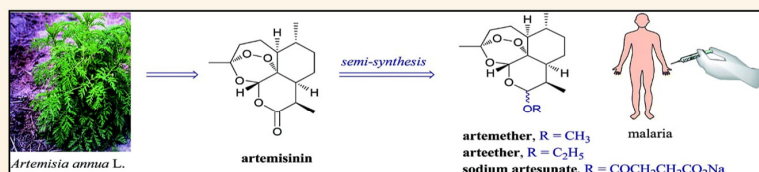
## Happy Birthday, Mr. Mendel

The 200th Birth Anniversary of the father of modern genetics, Gregor Mendel was celebrated by several initiatives undertaken in July, 2022. A collection of papers was released by Nature Reviews Genetics that highlighted the importance of the basic principles of inheritance not only for plant genetics but also for human diseases or animal breeding. The Gregor Mendel Institute of Molecular Plant Biology, Vienna, Austria powered a dedicated webpage containing information about Mendel's legacy.



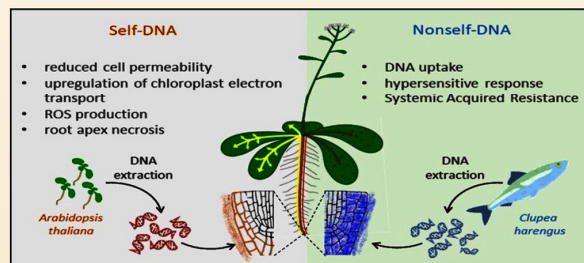
## 50 years of discovery of Artemisinin, the miracle molecule that saved million lives

The year 2022 marked 50 years of the remarkable discovery of the wonder drug Artemisinin. It is a sesquiterpene lactone that accumulates in the trichomes of the aromatic plant *Artemisia annua*. It was chemically identified in 1972 and since then it has successfully being employed to treat malaria, saving millions of lives worldwide (WHO report, 2020). Although the malarial parasite strains resistant to Artemisinin have been detected in Africa and South East Asia, recent bio-medical investigation uncovered potential roles for this molecule in the treatment of different diseases, including cancer.



## International Conference on Arabidopsis Research (ICAR 2022) held in Belfast in June 2022

The conference discussed the importance of *Arabidopsis* as model organism for adaptive evolution studies in plants & shared new methods for the integration of OMICS data into networks.



## Perennialization of cereals as a promising approach for sustainable agriculture

In April 2022, Nature Sustainability published the results of research of perennialization of Rice. The process involved hybridization of cultivated Asian rice (*Oryza sativa*) with perennial undomesticated African rice (*Oryza longistaminata*) and successive rounds of selection of the best performing progeny characterized by high grain yield, good grain quality and strong regrowth capacity. Perennial rice can produce seeds twice a year during 10 growing seasons and show clear advantages over Annual rice such as easier crop management system, improved key soil properties and reduced input requirement.

## Genome spotlight of C-fern (*Ceratopteris richardii*)

Fern genomes are difficult to construct due to their immense size and complexity. In general fern genomes are 12Gb long on average which is larger than most flowering plants and nearly 4 times the length of human genome. According to recent report (the-scientist.com, September 2022), research teams have succeeded in assembling high quality genomes of C-fern (*Ceratopteris richardii*; 7.47Gb), Flying spider monkey tree fern (*Alsophila spinulosa*; 6.23Gb), Southern Maiden hair fern (*Adiantum capillus-veneris* 4.8Gb). Transposable elements and repetitive sequences are responsible for the larger size of these genomes. C-fern a model organism, also had a tendency to incorporate DNA from other species like bacteria via horizontal gene transfer.





# INTERNATIONAL YEAR OF MILLETS AND INDIA



**Sumi Das**  
Asst. Professor

Dept. of Botany, D.K. College, Mirza

The year of 2023 has been declared as the 'International Year of Millets' by the Food and Agriculture Organisation (FAO) and United Nations (UN) to create awareness about health and nutritional benefits of millets. It was India, who proposed the idea to observe an International year for this food crop and finally got the approval in this year by those leading organisations. India is currently the largest producer of millets, followed by Nigeria, Niger and China. India's PM, Shri Narendra Modi has also shared his vision to make it a 'People's Movement' alongside making India as the 'Global Hub for Millets'. Millets comprise of a number of small seeded annual grasses that are cultivated as grain crops. Some of the common millets available in India are Ragi (Finger millet), Jowar (Sorghum), Bajra (Pearl millet), Sama (Little millet) and Variga (Proso millet). The earliest evidence of its domestication has been found in the Indus valley civilization. But they have not got the recognition like other cereals such as wheat and rice in the whole world. Therefore it can be hoped that this kind of declaration and associated activities will enlighten the hidden benefits of this food.

The FAO has pointed out 6 reasons to bring millets to the market, which are-

1. They are climate- resilient and require minimal inputs and maintenance.
2. They can be a solution to the food scarcity causing due to increasing population since they are easy to grow.
3. They are loaded with fiber, antioxidants, minerals and protein, but are gluten free.
4. They offer promising livelihood opportunities for small scale farmers.
5. Millets' trade can improve the diversity of the global food system.
6. They can be used in many innovative ways, such as in the fields of pharmaceuticals and therapeutics.



The Government of India's Department of Agriculture and Farmers welfare has taken a proactive multi-stakeholder engagement approach to achieve the aim of IYM 2023, engaging all states and UTs and embassies. A number of Millet-centric activities are being conducted.

This millet campaign will be incomplete without mentioning the 'Millet man of India', Dr. Khader Vali. An alumni of II Sc, Bengaluru, Dr. Vali worked hard to revive five different types of millets that were fast disappearing. In the process of consuming

each of these millets, he discovered that the healing properties present in them could cure even deadly diseases. Hence, he named these five millets **Siridhanya**. Dr. Vali propounded a method called 'Kadu krishi', which is also known as 'jungle farming'. He is also involved in educating people and farmers, spreading awareness on preservation of water and nature.

Given that India is the largest producer and one of the biggest exporters of millets, the global attention on millets this year is sure to come as a boost for Indian farmers. ■



References : <https://www.fao.org> | <https://www.nabard.org> | <https://pib.gov.in>

## OBITUARY



**HIREN THAKURIA**

The Department of Botany is grateful for the dedicated service rendered. We offer heartfelt condolence and pray to Almighty for the eternal peace of the departed soul.



# HOW TREES TALK?



**Himakshi Goswami**

B.Sc. 6th Semester

Botany (Hons.)



When we think of trees, we often imagine them as solitary beings, standing alone in forest and has its own trunk, branches and leaves. However recent research has shown that trees are much more social and connected than we thought. In fact, trees are capable of communicating with one another in a variety of ways.

One of the most fascinating ways that trees communicate is through underground networks of fungi known as mycorrhiza. These networks connect the roots of different trees and allow them to exchange nutrients and information. For example, a tree that is under attack from insects can send warning signals through the mycorrhizal network to neighbouring trees, which can then produce chemicals to repel the insects.

Trees also communicate by releasing volatile organic compounds (VOC), which are chemicals that can be detected by other trees and even animals. For example, when a tree is damaged by an herbivore, it may release VOCs that attract predators of the herbivore, thereby protecting itself and neighbouring trees.

In addition to communication, trees also cooperate with each other in variety of ways. For example, trees in forest can work together to share sunlight and resources. Tall trees may grow slower in order to allow

shorter trees to receive more sunlight, while older trees may provide nutrients to younger trees. The study of social lives of trees has important implications for forestry and conservation. By understanding how trees communicate and cooperate, we can develop more effective strategies for managing forests and promoting biodiversity. It also provides a new perspective on the interconnectedness of all living things and the importance of cooperation and communication in nature. ■

REFERENCE :

<https://wikipedia.org> | <https://onetreepanted.org>.



## HYDNORA

### The Strangest Plant In The World



**Dhritismita Roy Choudhury**

B.Sc 6th Semester

(Botany Hons.)

*Hydnora* is a poorly known genus of parasitic plants from Africa and Southern Arabia. An extreme reduction in morphological features, including the complete lack of leaves, has led to *Hydnora's* reputation as "The Strangest Plant In The World". Although it is among the most basal parasitic angiosperms known to science, a very little work has been carried out on the genus and it remains virtually unknown in cultivation. This holoparasitic plant only emerges above ground to flower. It can damage infrastructure by bursting through pavements and scarcely resembles any other flowering plants. Eight species of *Hydnora* are now recognised out of which one was identified in 2011 in a market advertised as traditional medicine in Johannesburg.

*Hydnora* has a narrow host range and is parasitic upon the roots of host plants in the Spurge, legumes and torchwood.

The pollination syndrome of *Hydnora* is classified as brood site mimicry with imprisonment. This peculiar flowers attracts insect pollinators with very fetid smell, and with slight heat production and temporarily imprison them in floral chambers. The floral chamber of *Hydnora* comprises of two parts: androecial (male) chamber and a subtending gynoecial (female) chamber, connected by

central orifice that allows the passage of floral visitors between them.

Empirical studies on the *Hydnora* are very scarce; however recent research by Naumann et.al (2016) has put a spot light on the genus *Hydnora* as a new model for understanding plastome evolution in parasitic plants.

Taken together, like so many parasitic plants, *Hydnora* one of the "Strangest plants in the world" remains elusive to science and cultivation. Even though about 1% of the flowering plants are parasitic, from an evolutionary perspective, parasitic plants are under researched. As one of the earliest branching parasitic plants in the angiosperm phylogeny, *Hydnora* shows particular promises for investigating the evolutionary origins of parasitism in flowering plants. ■



Fig: Images of different *Hydnora* species



# Field trip to Krishi Vigyan Kendra, Kahikuchi Kamrup- A Report



Field trip taken by : B.Sc. 5th Sem (HC) students | Field trip undertaken on : 6th of January, 2022

**Objective of the trip :** To gain first hand knowledge on Organic Farming and Horticultural Practices undertaken in Krishi Vigyan Kendra.

## KVK at a Glance

KVK is an integral part of the National Agricultural Research System (NARS). It is an agricultural extension centre associated with the Assam Agriculture University. The main objective of the KVK, Kahikuchi is testing and transfer of agricultural technology to bridge the gap between production and productivity and to offer self employment opportunities among the farming community and among unemployed educated rural youth. It aims at assessment of location specific technology modules in Agriculture and allied enterprises.

## Field Observation

- (a) **Model of Integrated Farming System :**  
Land use system where crop production, livestock raising, fishery, poultry, bee-keeping were practiced and the waste of one practice was used as a resource for the other.
- (b) **Demonstration plots of Medicinal Plants:**  
The following Medicinal plants were observed in the plots:  
– *Bacopa monnieri* (Plantaginaceae)  
– *Mentha piperita* (Lamiaceae)  
– *Piper longum* (Piperaceae)  
– *Rauwolfia serpentina* (Apocynaceae)  
– *Swertia chirayita* (Gentianaceae)

- *Houttuynia cordata* (Saururaceae)  
Mosundori  
– *Catharanthus roseus* (Apocynaceae)  
– *Aloe barbadensis* (Asphodelaceae)  
– *Bryophyllum* sp.  
(*Kalanchoe pinnata*; Crassulaceae)
- (c) Demonstration of sprinkler irrigation technique for pumpkin cultivation.
- (d) **Visit to Floriculture plots :**  
The floriculture plots had different varieties of Marigold, *Chrysanthemum* and Bearded Iris. Mulching technique was also demonstrated for the cultivation of tuberoses.
- (e) **Horticultural practices for the Propagation of Assam Lemon :**  
Stem cuttings and leaf bud cutting techniques were demonstrated for the propagation of the high valued Assam Lemon variety.
- (f) **Demonstration of Rapid multiplication method of Black Pepper :**  
The trench method where trenches were dug, filled with rooting medium and split halves of bamboo kept upward on one side of the trench was demonstrated. Rooted cuttings were planted in the trench at the rate of one cutting for each bamboo split.

- (g) Demonstration of Dragonfruit cultivation plots.
- (h) **Demonstration of multi storied cropping system :**  
This cropping pattern involving cultivation of crops of different heights in the same field at the same time was demonstrated with the cultivation of Areca nut, Banana, Lemon, Pineapple, Black pepper, Ginger.
- (i) Demonstration of oil-seed hub.
- (j) Demonstration of Vermicomposting by Bed method and Pit method.

## Attended talk on Organic Farming

KVK scientist delivered talk on Organic Farming, which is a holistic food production system that promotes and enhances agro ecosystem health including quality and healthy food. The components of organic farming included physical/ cultural methods like crop rotation, manual weeding, mulching, timely sowing to avoid pests etc and biological methods like application of green manuring, biofertilizers and biopesticides.

## COMMENT

The field trip was highly beneficial and stressed on the potential of horticulture and organic farming for self employment. ■





## DEPARTMENTAL BUZZ

# Students Progression to Higher Education

**DURING : 2022-23**

Sl. No.	Name of the Student	Name of the Course Admitted to	Name of the Institute Enrolled in
1	Deepjyoti Medhi	M.Sc. Botany	Gauhati University
2	Nilpaban Mali	M.Sc. Botany	Gauhati University
3	Partha Pratim Baruah	M.Sc. Botany	Gauhati University
4	Pubali Kalita	M.Sc. Botany	Gauhati University
5	Dhritishree Das	M.Sc. Botany	Gauhati University
6	Almina Jabin	M.Sc. Botany	B.Barooah College
7	Rituparna Das	M.Sc. Botany	Darrang College
8	Riya Das	M.Sc. Botany	Royal Global University
9	Violina Sharma	M.Sc. Botany	Royal Global University
10	Trishna Kakoti	M.Sc. Botany	Rangia College
11	Trishna Das	M.Sc. Botany	Royal Global University

## DEPARTMENT TOPPERS : 2022-23



**Riya Das**

Total Marks Obtained  
**1298**



**Violina Sharma**

Total Marks Obtained  
**1230**



**Kaberi Bora**

Total Marks Obtained  
**1220**

## RESULT : 2022-23

No. of students appeared in Botany (Hons.)	30
No. of First Class Holders	30
No. of students securing CGPA above 8	06

## Parent Teacher Meeting

On 25th March, 2023, the parents of the students pursuing B.Sc. Botany Honors took part in an open interactive meet with the faculty members.



## INAUGURATION OF DEPARTMENTAL WALL MAGAZINE





## DEPARTMENTAL BUZZ

### One Day Workshop on Career Oppourtunities with Special Reference to Botany Graduates.



### Department of Botany took part in the Cultural Rally organised on the occasion of College Week



### Students of B.Sc. 5th Semester Botany Honours along with Faculty Members in a Field Trip to ICAR, Borapani, Meghalaya.

