

In this Newsletter:

- *Editorial Box
- *Note from the Coordinator's Desk of Adv. State Biotech Hub
- *Total Programmes Conducted
- *Hands-On-Trainings
- *Miscellaneous Box I
- *Workshops conducted
- *Miscellaneous Box II
- *Outreach Programmes
- *Seminar Programme cum Popular Talks cum Awareness Programme
- *Scholars Trainings & Student Exchange Programme
- *Invited Lectures to other institutions
- *Celebration of National and International Events
- *Other Major Achievements
- *Few Snapshots
- *Article

Editorial Board:

- Dr. Nripen Goswami, Principal & Chairman, J.N.C, Boko
- Dr. Tapan Dutta, Co-ordinator, Biotech Hub, J.N.C, Boko
- Dr. Susanta Kumar Bhuyan, Co-coordinator, Biotech Hub, J.N.C, Boko
- Jayashree Goswami, SRF, Biotech Hub, J.N.C, Boko

From the Coordinator's Desk of Adv. State Biotech Hub, Assam

"I was highly impressed by the infrastructure developed under the DBT Funded Adv. Level Institutional Biotech Hub of this college and their ongoing activities. I congratulate the Coordinator for the same and also thank the Principal of the college for his continuous support to the activities of the Hub. I hope and expect that the Hub will carry further forward its sincere efforts in fulfilling the mandates of the Biotech Hub scheme, which will directly benefit the end-users, i.e. the students and teachers of this college, and other neighbouring institutes."

(*as written by him in the college Biotech Hub visitor's book)

Signature

[Handwritten Signature]
17.3.2018
(P. Borah)
Coordinator
Adv. State Biotech Hub (Assam)

Workshops/ Training/ Seminar/ Outreach/ Popular Talk/ Invited Lecture Programmes:

Since 1st April, 2017 till 7th April, 2018, the Biotech Hub of the college has so far organised **Two training programmes, Three workshops, One outreach programme, Four seminars cum Popular Talks cum Awareness Programmes.** The Biotech Hub also sponsored **research scholars** for attending **one training programme and one workshop** at other Institutions/organizations. Along-with that the Biotech Hub of the college also arranged faculties from various departments and research scholars from the host college to offer lectures to students of other institutions as well as non-science based students of the host college to provide them knowledge about various related topics to uplift their knowledge. **Two such invited lectures/hands-on trainings** were offered at other institutions during the time period.

Hands-On-Trainings conducted:

Two five-day long Hands-On-Training programmes have been conducted by the Biotech Hub of the college for students, teachers and research scholars during the years 2017-2018.

On 19th December, 2017, a five-day long a Hands-On-Training programme was organized by the Biotech Hub, which was attended by the students of the host college and also Dudhnoi College, Dudhnoi. A total of 57 undergraduate students were trained by **Dr. Akan Das, Assistant Professor, Department of Applied Biology, University of Science and Technology, Meghalaya,** and **Dr. Pranjan Barman, Assistant Professor, Department of Biotechnology, Gauhati University, Guwahati** on the topic **“Bioinformatics for Beginners”**, on the topics covering the 6th semester Botany syllabus for major course.

On 3rd April, 2018, another Hands-On-Training programme was conducted by the Biotech Hub which lasted for five day, i.e. till **7th April, 2018.** A total of 25 undergraduate botany students from the host college participated in the

Miscellaneous I:

Research activities undertaken by the Biotech Hub:

- Study on some aspects of Reproductive biology of Muga silk worm *Antheraea assamensis* Helfer (completed)
- Antioxidant and antimicrobial properties of six edible species of Araceae family (ongoing)
- Phytochemical and pharmacological investigation of two ethnomedicinal plants used in diabetes and traditional bone setting practice by Rabha Tribes (ongoing)
- Nutraceutical Evaluation of some ethnomedicinal plants available in Rabha Hasong Autonomous Council Area (ongoing)
- Ethno zoological Survey will be carried out in some selected places of Kamrup District (To be started soon)
- Phylogenetic analysis of some selected medicinal plant species (To be started soon)

Paper accepted for publication, completed by the support of Biotech Hub:

Topic: “Reproductive biology of Muga Silkworm *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae): Key factors influencing seasonal variation in its reproductive performance”, Full paper sent and accepted for publication in the Proceeding of 8th International Conference on Wild Silk-moths.

Instruments newly procured in the Biotech Hub:

- Column Chromatography
- PC based UV-VIS spectro photometer (Systronics).
- UV-Chamber
- Rotary Evaporator
- Laminar Flow Chamber
- PCR Machine
- Digital Balance Digital Turbidometer
- Soxhlet apparatus
- Deep freezer 3 KVA Online UPS
- Printer
- Projector with screen
- Air Conditioner with Stabilizer

programme and were trained by **Dr. Pranjan Barman**, Assistant Professor, Department of **Biotechnology, Gauhati University, Guwahati**, Dr. Rekha Bora, RA, Biotech Hub, J. N. College, Boko, Jayashree Goswami, SRF, Biotech Hub, J. N. College, Boko and Seema Khakhalary, JRF, Biotech Hub, J. N. College, Boko on a very important Biotechnological topic “**Basic Biotechnological Laboratory Techniques**”. During this training the students practically learnt about the Pharmacognosical studies of medicinal plant, Histochemical Tests, Plant Tissue Culture, PCR and had a doubt clearing session with Dr. Pranjan Barman about various Biotechnological topics.

Workshops conducted:

A day long Trans-boundary knowledge sharing workshop on “**Disaster and Climate Risk Mitigation in the Brahmaputra River Basin: Perspective from India and Bangladesh**” was organised by the Hub in collaboration with *Aaranyak, (A Scientific and Industrial Research Organization of India)*, Assam, on 9th November, 2017. A total of 114 participants attended the workshop which included a delegation from Bangladesh, having about 12 members, comprising Government officials, civil society members and community people participated in the workshop. A section of local people from flood affected areas of Kamrup District also participated in the experience sharing sessions. The workshop aimed at providing an opportunity to learn about the good practices of disaster management prevailing among Governments, NGOs and communities in both the countries. The main objective of the workshop was to share experience, information and knowledge about how people living in the Brahmaputra River basin in India and Bangladesh are affected by floods, erosion and climate change effects and how Governments and communities manage such hazards.

A one-day Entrepreneurship development workshop on “**Natural Dying of silk product: Techniques and Prospects**” was organized on 6th December, 2017, to promote

Miscellaneous II:

Papers presented by the support of Biotech Hub:

i. Presented paper (oral) in UGC National Seminar on Climate Change, Biodiversity and sustainable resource management, organized by Dept. of Zoology, B.H. College, Howly, on 3rd to 4th June, 2017

Topic: “Reproductive performance of Muga Silkworm *Antheraea assamensis* Helfer with reference to elevated ambient temperature during summer season”

ii. Presented paper (oral) at a National Seminar organized at Gauhati University, Botany Dept. on 25th to 26th Nov, 2017

Topic: “Ethno-medicine: Belief and Conservation. A case study among the Rabha Tribe of Assam”

iii. Presented paper (oral) in the 8th International Conference on Wild Silk-moths, at Hotel Radisson Blu, Guwahati, organized on 22nd to 24th Jan, 2018

Topic: “Reproductive biology of Muga Silkworm *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae): Key factors influencing seasonal variation in its reproductive performance”

iv. Presented paper (oral and poster) at International Symposium on Biodiversity and Bio-banking (Biodiverse) organized at IITG, Assam, on 27th to 29th Jan, 2018.

Topic: “Ethno-medicinal Plants used by the people of Rabha Hasong Autonomous Council Area for the treatment of gastrointestinal disorders and Urinary trouble”

Current Manpower in the Hub:

- **Research Associate** – Dr. Rekha Bora, M. Sc, B.Ed, Ph.D
- **Senior Research Fellow** – Jayashree Goswami, M.Sc (Biotechnology)
- **Junior Research Fellow** – Seema Khakhalary, M.Sc (Botany)

interest in development of entrepreneurship prospects and create an employment generation field based on natural dying of silk product. This workshop was attended by a total of 75 participants.

Another collaborative workshop was organized on **17th March, 2018**, jointly by Adv. State Biotech Hub, Assam, and Adv. level Institutional Biotech Hub, J. N. College, Boko, on the topic **“Molecular Techniques”**. About 36 UG Level students from J.N.College, Boko and B.P. Chaliha College, Nagarbera, participated in the workshop and got an opportunity to learn and perform DNA extraction from bacterial culture and PCR.

Outreach programmes conducted:

On **29th March, 2018**, an outreach programme was organised by the Biotech Hub of the college at **Boko High School, Boko**, on the topic **“Popularizing Organic Farming and Prevention against Waterborne Diseases”**, which were delivered by **Dr. Rekha Bora, RA, Biotech Hub, J. N. College, Boko** and **Seema Khakhalary, JRF, Biotech Hub, J. N. College, Boko**. The motive of the outreach was to aware the high school students about the benefits of organic farming, to motivate them towards adopting organic farming for their kitchen-garden and also be able to encourage their parents, if they are farmers, to opt for organic farming for the benefit of all. The other motive of the programme was to spread awareness the children regarding the harmful effects of various waterborne diseases, identifying its symptoms, methods to prevent it beforehand and few ethno-botanical cures easily available at home.

Seminars cum Awareness Programme cum Popular Talks Conducted:

Some scientific topics are quite new and interesting to learn about, while some topics relates to burning problems of the society, various health problems are also prevailing in the society some of which gets very less attention owing to lack of proper knowledge. Creating awareness regarding such topics by eminent persons helps in clearing doubts and concepts on the topics. As such the Biotech Hub arranges for popular talks and awareness programmes cum seminars time to time.

On **7th June, 2017**, a seminar cum popular talk was organized by the Biotech Hub, in collaboration with Department of Botany, J.N. College, Boko, to mark the occasion of World Environment Day. On the occasion, **Dr. Nuruddin Ahmed, Associate Professor, Department of Chemistry, J.N. College, Boko**, delivered a very informative lecture on one of the important and newly evolved topic **“Green Chemistry”**. The programme was attended by a total of 96 participants.

Another seminar cum popular talk was organized on **28th February, 2017**, by the Biotech Hub, on the occasion of National Science Day on the topic **“Wetland Resource and Sustainable Development”**, which was delivered by Dr. Upen Deka.

On **8th March, 2018** International Women’s Day was celebrated by organizing Awareness cum Seminar, in collaboration with the Women Cell of the college, on the topic **“Women Health: Food and Nutrition with special reference to rural women”**, where **Mrs. Deepanki Devi, Dietician, Founder of NutriDiet Clinic, Life Member of Indian Dietics Association**, delivered a very informative talk focusing on the benefits of proper food and nutrition for women health and importance of taking care of their own health.

On **31st March, 2018**, awareness cum Popular Talk was organized by the Biotech Hub at Jarapara Mahila Sangha on the topic **“Prevention of Cancer among Women”**. During this programme, **Dr. Sunil Pawan Borpujari, Oncologist, Apollo Clinic, Guwahati**, delivered a talk to educate students and women self help group of the nearby area regarding early detecting symptoms and prevention of cancer, especially breast cancer.

Research scholars training and Student Exchange programmes:

Performing research work for the benefit of the society is the prime motive of a Biotech Hub, along with guiding the students through their studies and practicals and providing them knowledge about the newer laboratory practises. For carrying out a good research work in the hub research scholars also need to be well trained. Hence, it is very necessary that the research scholars of the college be well updated and trained in their fields. Hence the hub arranges for their training at other renowned institutions to train them well. Also another motive of the Hub is to acquaint the students with as many advanced laboratory equipments as possible to inspire them towards science related fields. As such the Hub arranges for student exchange programme.

The Hub sponsored two research scholars of the college, Jayashree Goswami, SRF, and Seema Khakhalary, JRF, to attend a two day long workshop on “**Scientific Research Paper Writing**” organized by Botanical Society of Assam, at Gauhati University, Dept. of Botany, **from 14th to 15th July**, to help them with writing research paper easily and with confidence.

One such five day training programme for proper training of research scholars of the Hub on an important topic “**Molecular Tools in Genomics and Proteomics Research**” was held **from 20-24th Nov, 2017**, at Adv. State Biotech Hub, College of Veterinary Science, AAU, Khanapara, which was attended by Dr. Rekha Bora, RA. The aim of attending the training was to get introduced with basic bioinformatics tools and methods which would be helpful to conduct advanced research in genomics and proteomics.

The Adv. Level Biotech Hub of the college carried out **student exchange programme on 5th March, 2018, to Adv. Biotech Hub, B.P. Chaliha College, Nagarbera**, with the motif of allowing the undergraduate students of the host college to learn about advanced lab equipments available there like **the Gel Doc system**.

Invited lectures offered at other Institutions:

Since 1st April, 2017 till 7th April, 2018, the Biotech Hub of the college arranged for faculties of this college to go and deliver lectures at other institutions on useful topics for the benefit of students and faculties of nearby colleges and schools so as to develop scientific thinking in and around Boko which will in turn help in the upgrading of the society as a whole.

One such invited talk was offered by the Coordinator of the Hub cum Associate Professor, Dept. of Botany, **Dr. Tapan Dutta**, on behalf of the Biotech Hub at the Adv. Level Biotech Hub, B.P. Chaliha College, Nagerbera, on the topic “**Career opportunities in Bio science**” on **25th January, 2018**. During this talk, the Coordinator focused on various career paths available for the students in the field of Bio-science and helped in clearing their doubts.

On 2nd Feb, 2018, Dr. Upen Deka, was invited to deliver a seminar on the topic “**Wetlands of Assam and its Conservation**” at **Ashoka Trust for Research in Ecology and the Environment (ATREE)**, organized in collaboration with **Salbari College, Barpeta**, to focus on various ways of conserving wetlands of Assam which are one of the major natural habitat for many aquatic plants and animals.

Celebration of National and International Events:

The Adv. Level Biotech Hub of the college believes in celebrating science along with the nation to connect the nearby area with the science going on in other parts of the nation. Also the base of science and our existence is the environment around us and everywhere, so to prosper in science respecting the environment is inevitable. While the Hub aims to strengthen the society through science it understands that a strong society lies in the hand of strong and healthy women. As such, to

provide a tribute to science, the environment and womanhood, the biotech hub celebrates World Environment Day, National Science Day and International Women's Day on 5th June, 28th Feb and 8th March respectively every year by organizing various events to mark the occasion.

Like every year, in the year **2017** also World Environment Day was celebrated on **5th June** by the Biotech Hub by organizing a tree sapling plantation event in the college campus and a popular talk by a well respected faculty of the college, **Dr. Nuruddin Ahmed, Associate Professor, Department of Chemistry, J.N. College, Boko**, delivered a very informative lecture on one of the important and newly evolved topic "**Green Chemistry**".

On **28th February, 2018**, National Science Day was celebrated by organizing an inter-school Open Speech competition, natural on-the-spot photography competition and spot painting competition among school students and a popular talk by **Dr. Upen Deka** on the topic "**Wetland Resource and Sustainable Development**". All the students and staff members of the college attended the event and cooperated in making the event a successful one. Different schools from in and around Boko participated in the speech competition. Price money and certificate was awarded to the winners.

Other Major achievements of the Biotech Hub during the year:

- ✚ Re-construction of the Biotech Hub in a separate building with much more space with island table for carrying out research work more fluently. Also construction of a separate Culture Room inside the new lab to start culture works in the lab.
- ✚ Organized an "**Interactive Meet of Coordinators**" on **17th March, 2018** of the Coordinators of the nearby Biotech Hubs, with Dr. Probohd Borah, Coordinator, Adv. State Biotech Hub, Assam, in the chair to discuss various important topics for the betterment and benefit of the Biotech Hubs.
- ✚ Contributed 5 protocols to the "**E- manual**" published by DBT under its project "**Generate E-SOP and Lab Manual**".
- ✚ Inspired undergraduate students towards **nature studies** by organizing visit to Daffodil Nursery cum Horticulture Training centre and Botanical Garden, Gauhati University.
- ✚ Mentored Siphajhar H.S. Schools for applying for BLiSS and have recommended for the grant.

Few Snapshots

Hands-On-Training Conducted

❖ "**Bioinformatics for Beginners**"





Workshops Conducted

❖ ***“Basic Biotechnological Laboratory Techniques”***



❖ ***“Disaster and Climate Risk Mitigation in the Brahmaputra River Basin: Perspective from India and Bangladesh”***





❖ *“Molecular Techniques”*



Outreach Conducted

❖ *At Boko High School, Boko, on “Popularizing Organic Farming and Prevention against Waterborne Diseases”*



Seminars cum Awareness cum Popular Talk:

- ❖ *Seminar cum Popular Talk on “Women Health: Food and Nutrition with special reference to rural women”:*



- ❖ *Awareness cum Popular Talk on “Prevention of Cancer among Women”:*



Celebration of National and International Events:

- ❖ *World Environment Day:*



❖ *National Science Day:*



❖ *International Women's Day:*



Interactive Meet of Coordinators:



Re-constructed Adv. Biotech Hub:





ARTICLES

Scope of Ethnomedicinal study in the Rabha Hasong Autonomous Council Area and Socio-cultural life of Rabha people of Assam

Plants are known as the chief reservoir of medicines. These generally hold different natural products that have profuse health benefits. As stated by WHO, around 80% of the world's population show their faith towards the herbal remedies to mitigate their health problems. According to Handa, 1998, more than 1500 species are known those are extensively utilized in herbal medicine.

The Rabha Hasong Autonomous Council area is known as rich bio-diversified region of Assam. The area lies in-between $25^{\circ} 53' - 26^{\circ} 49'$ N latitude and $90^{\circ} 07' - 91^{\circ} 50'$ E longitude, harmonically dwelled by different communities. Among these, mainly four ethnic communities, Rabha, Bodo, Garo and Hajong are available. But, majority of people are from Rabha tribe which is a significant ethnic group of Assam as well as India. This tribe is reside generally in the three districts of Brahmaputra valley, Goalpara, Kamrup and some parts of Darrang district. There are many sub-communities of Rabha viz, Rangdani, Maitori, Pati, Koch, Dahuri, Sangha etc. Dominant are Rangdani, Maitori and Pati. Excluding Paties all groups of the tribe speak either Rangdani or Maitori. Only Paties communicates in Assamese language as they are geographically cut off from other sub-groups of Rabha tribe. Paties are very much influenced by the Assamese socio-culture life. Their attractive and colourful handloom dresses of women known as "Kangmang" which is prepared by their own. Moreover, they offer fresh home-made rice-beer to guests and also in public and religious events.

Most of them live in very rural areas where there are less availability of modern facilities and hence they have to depend on traditional medicine that is low cost and easily available. In this a way these herbal medicines till now serve as most faithful and effective medicine among the tribal

community. Many traditional healers known as Ojha, Bej, Kabiraj etc. are available in the tribal villages who successfully provide their services to the society. They are doing this with a very negligible charge and few are doing even free of cost.

Other communities such as, Garo and Hajong those are also living in non-urbanized parts of the Rabha Hasong Autonomous Council area also depend on traditional health practice which is still acceptable among them as its low cost, safe as well as effectual nature. They are unable to reach modern medicinal facilities for this reason and also it is served as most authentic medicine among these people.

The tribal people of the areas have been practicing their traditional knowledge to cure different health problems. Both ethno-botanical and ethno-zoological applications are embrace in their medicine. Most of the medicines are in the mono-herbal formulation which is easy to prepare but poly-herbal formulation is also applied to increase the effectiveness of the medicine.

Unfortunately, very less number of people is aware about their traditional knowledge. Lack of practice, interest and rapid modernization of the new generation would cause the loss of such precious indigenous wisdom. Therefore, proper documentation of such practices, by conducting simple interviews of the traditional healers can be possible. So to acquire the numerous health benefits of this knowledge there is an urgent need to create proper record and awareness among them. Moreover these ethno-medicinal plants give a huge scope of new researches to the field of industrial crop, phytochemical, pharmacological, drug discovery, etc. as these are affluent source of secondary metabolites.

Dr. Rekha Bora
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Adv. Biotech Hub,
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