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VOL. 02 Indian Lichenological Society

ILS ELETTER

An Annual Newsletter



Lichen House

Stephen Sequeira established a dedicated lichen conservation repository at KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS) Campus in Kozhikode.

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Report

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Lichen Poem

A new poem (in Hindi) about the lichens by AK Mauraya and GK Mishra. The poem celebrate the beauty and diversity of these amazing organisms. They are a reminder that even the smallest and most unassuming creatures can be full of wonders.

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ILS eLETTER

An official newsletter of the Indian Lichenological Society

Volume : 02

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President's Message



*Dr. Dalip Kumar Upreti FNA, FNASc
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Dear Colleagues,

The identification practice of plants dates back to the Stone Age's period when human beings started identified the plants and animals which are of their daily use. The evolution of plant identification process got a fast pace throughout the world based on use of plants in traditional knowledge of different culture and civilization. The identification of plants in the pre-historic and proto-historic times remained confined to the applied aspects, that can be visualized in man's selection of plant products for different purposes and also raising agricultural crops after their domestication from the wild.

Based on the development of plant identification knowledge, history of the ancient Indian botany can be classified into Pre-Vedic and Post-Vedic botany. Pre-Vedic plant identification knowledge confined exclusively to the applied aspects, while in Post-Vedic botany, a number of terms were coined chiefly based on habit, morphology and properties of plants.

The classical plant identification methods involving morphology, anatomy, cytology, palynology simultaneously replaced by modern plant identification after supplementation of molecular and biotechnological tools and techniques. After the advent of Artificial Intelligence (AI), Machine Learning (ML) techniques replaced the traditional laboratory identification through molecular tools and techniques. In the recent decades, a lot of efforts made by taxonomist together with programmers ease the difficulty of species identification by developing a range of tools that involves the use of computer.

The new advances of plant identification base on three main AI technologies: expert system, artificial neural network and machine vision. Non-experts in plant species identification can use the techniques to easily identify the species.

A number of AI models are developed in the recent years such as Artificial Neural Network (ANN), Support Vector Machine (SVM), K-nearest neighbor (KNN), deep learning approach to identify plant species using image analysis are common techniques recently used in various fields of plant researches.

Convolution Neural Network (CNN) model are being successfully used in a wide range of image classification tasks including plant image identification, with state-of-the-art models performing CNN has an ability to exact image features, i.e. colour, shapes and edges. Some of the plant identification apps not only give the genus and common name of the plant but also provide information on its origin.

The automatic plant image identification is the most promising solution receives considerable attention involving both botany and computer technologies. A number of sophisticated models have been proposed for automatic plant identification, as the machine learning technology has advanced recently. The development of AI based models will not only used in classification but also used to invasive species prediction, forestry, food grains identification, horticulture, environment stress, insect and disease detection.

Editorial



Dr. Sanjeeva Nayaka
Editor
ILS eLetter

Incredible lichen treasure of Assam

It is my pleasure to write editorial for 2nd issue of ILS eLetter which is filled with interesting information from the lichen researchers of India. Through this newsletter world would admire the lichen wealth of India and potential of Indian Lichenologists. Utilising this opportunity, I would like to specially mention the incredible lichen diversity in Assam and appreciate the outstanding contribution of all the lichen researchers in Assam.

Lichens of Assam are explored since the year 1880s (Sitton, 1881). Singh and Sinha (2010) listed a total of 141 species from the state till that period. This number doubled in eight years with 300 species as documented by Gupta and Sinha (2018). Surprisingly, this number again double in just four years with 657 as compiled by Gogoi et al. (2022). However, the story did not stop there, many more new records of lichens are being reported from Assam, e.g. Islary et al. (2022a,b) reported *Ocellularia calvescens* (Fée) Müll. Arg. and *Rhabdodiscus subvavatus* (Nyl.) Rivas Plata et al. as new distributional record for India and eight more species as new to Assam. Few more new additions to the state are either communicated to the journals or manuscripts are under preparation while this editorial is being written.

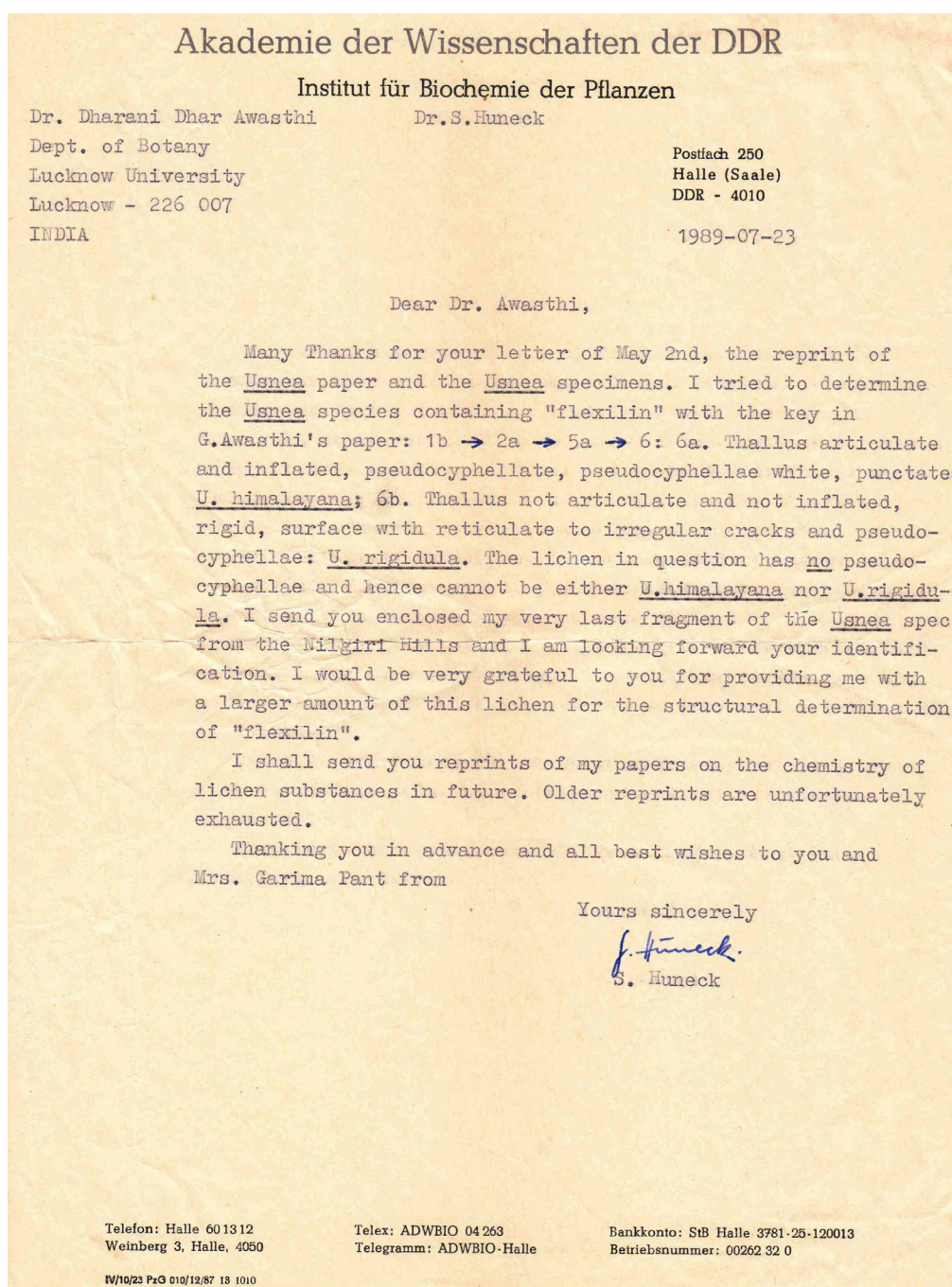
The real gleaming question is, why Assam has such a vast diversity of lichens? There are two main reasons, 1. geographical location and ecology of the state, and 2. intensive exploration. It can be noted that Assam is part of the transitional zone between the Indian, Indo-Malayan and Indo- Chinese biogeographical regions. The state is also located in the foothills of Eastern Himalaya, a biodiversity hotspot. Favourable climate, topographic and edaphic factors support luxuriant growth of diverse plant communities and create varied habitats suitable for the growth of lichens. The array of floristic richness has prompted many scholars to describe Assam as the “Biological Gateway” of Northeast. The eminent plant taxonomist and plant geographer Armen L. Takhtajan observed, “Cradle of flowering plants lies in between Assam and Fiji”. Assam harbours as many as 293 species of Orchids, 38 naturally growing species of bamboo, 952 medicinal plants. Further, 165 species of plants are restricted in distribution to certain pockets in Assam. The state also has rich diversity of fauna represented by mammals (193 spp.), birds (958 spp.), reptiles (187 spp.), amphibians (70 spp.), butterflies (1500 spp.), moths (387 spp.), freshwater snails (39 spp.) and fishes (197 spp.) (<https://asmervis.nic.in>). Therefore, it is obvious that Assam also harbours a rich diversity of lichens.

At present at-least five groups of researchers within the state are exploring various parts of Assam intensively for lichens in addition to CSIR-NBRI. Ultapani forest range in Kokrajhar district, Suang forest range in Nagoan, Dima Hasao district and Barak Valley as whole are interesting sites and have yielded several new records of lichens. However, there are many more interesting localities such as Upper Assam yet to be explored. I congratulate all the researchers for their amazing contribution to lichenology of Assam and wish good luck for further exploration.

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Dr. S. Huneck letter to Dr. D.D. Awasthi on 23 July 1989 (found from Dr DD Awasthi's literature collections)

The Secretary's Message



Dr. Gaurav Kumar Mishra
Secretary
Indian Lichenological Society

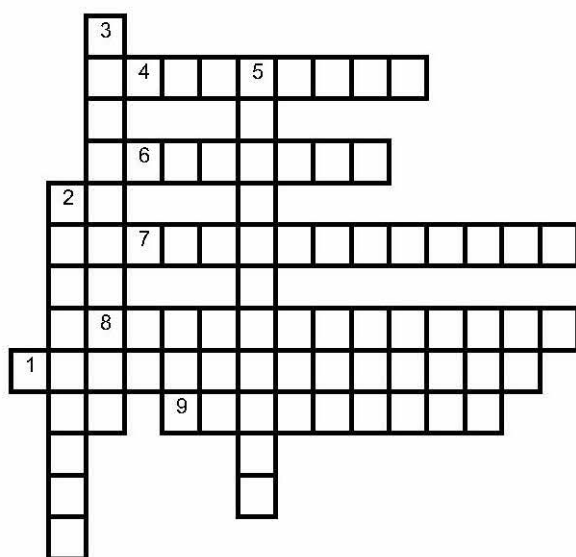
Dear friends,

We are thankful for your cooperation and support in “Dr. D.D. Awasthi Centenary Celebration - International Conference on Multidisciplinary Approaches in Lichenology (Hybrid mode)”; held at CSIR-NBRI during 28 th -30 th September 2022. We are looking forward to continuing your positive contribution to the society. We will strive to continue our work on popularization of Indian lichenological research to worldwide. I am confident your engagement with different aspects of lichenology will yield beneficial results in the global scientific community.

Through the newsletter we have tried to showcase our journey of memorable session. I congratulate the editorial board for their contribution and hoping for more milestone achieved in upcoming period. I also congratulate to those who have contributed in this issue.

I look forward to continuing our excellent cooperation in the future, and extend my best wishes for the publication.

LICHEN CROSSWORD II



ACROSS

2. A lichen genus containing anthraquinones (9)
3. A lichen genus with hymenial algae (10)
5. Fungi commonly known as laboratory weed (11)

ACROSS

1. Locular outgrowth commonly seen in the ascospores of Physciaceae (14)
4. Father of lichenology (8)
6. Script lichen (7)
7. lichen growing in high nitrogen conditions (12)
8. Conditions in which lack active mechanism to regulate their water content (13)
9. Lichen with mazedia known as (9)

Prepared by
Shweta Sharma
Lichenology Lab, CSIR-NBRI,
Lucknow

Lichen House: A Unique Lichen Conservation Repository

Stephen Sequeira & Arun Christy Sebastian

Maharaja's College
Ernakulam, Kerala, India
E-mail: stephen@maharajas.ac.in

In an effort to establish a dedicated lichen conservation repository, Maharaja's College, Ernakulam in association with the KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS) Campus in Kozhikode has undertaken an innovative approach. - a remarkable project called the "Lichen House" has been realized. Inside the Lichen House, a specially designed room, a simulated forest environment has been created with the inclusion of trees, shrubs, grasses, and boulders. The room has been meticulously disinfected to control pests and insects, and an air conditioning system has been installed to maintain optimal temperature and humidity levels. To enhance the ambiance and promote awareness, vivid paintings depicting lichens adorn the exterior of the Lichen House. Within this unique conservatory, lichen specimens collected from various forest areas across Kerala have been meticulously affixed to appropriate artificial substrata. This ensures the long-term preservation and display of more than 100 specimens, representing 84 different lichen species encompassing all forms of lichens. The specimens provide a comprehensive representation of lichen diversity, allowing visitors, students, and the general public to observe and appreciate these fascinating organisms.

To further facilitate learning and understanding, LED display boards have been strategically placed inside the Lichen House. These informative boards present various aspects of lichens, enabling easy comprehension and knowledge acquisition for students and visitors alike. The establishment of the Lichen House at the MBGIPS campus signifies a significant contribution to lichen conservation efforts. It not only serves as a repository for lichen specimens but also acts as an educational platform, promoting awareness and appreciation for these remarkable organisms. By creating a simulated ecosystem and providing an immersive experience, the Lichen House offers a unique opportunity to explore the diverse world of lichens within a controlled environment. This initiative will undoubtedly foster scientific research, environmental education, and public engagement in the field of lichenology.



Figure 1: Entrance of the lichen house at KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS) Campus in Kozhikode.

This significant endeavour will not only contribute to the preservation of lichens but also enhance our understanding and appreciation of their ecological importance. This unique lichen house was established by the financial support by Kerala State Council for Science, Technology & Environment (KSCSTE), Govt. of Kerala, Thiruvananthapuram, Kerala.



Figure 2: Display inside the lichen house



CYPHELLOSTEREUM INDICUM S. NAYAKA AND A. DEBNATH, a new species of basidiolichen described from Arunachal Pradesh (Photo credit: S. Nayaka). For more details, refer: *Phytotaxa* 603 (3): 271–279. <https://doi.org/10.11646/phytotaxa.603.3.6>

Lichen Colonization on Nylon Net House

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Lichens are remarkable composite organisms that display adaptability and resilience, enabling them to grow on various natural substrate together with a number of man-made substrates, including plastic netting. A number of studies are available of lichens growing on plastic net houses as, Upreti and Dixit (2002) reported 11 lichen species in a Royal Botanic Garden in Kathmandu, Nepal. Additionally, Jagtap *et al.* (2013) and Joshi *et al.* (2014) identified 30 lichen species on plastic net houses in Almora district, Uttarakhand. Upadhyay *et al.* (2020) documented 19 lichen species, including 12 new reports of plasticolous lichen mycota from India.

The present study is based on the lichens found growing on plastic nylon net house at Department of Botany, Soban Singh Jeena University, Almora. The nylon net showed growth of lichens on both inner and outer side of the net. The nylon net comprised of thick threads made up of thin fibres which due to weathering accumulate dust particles and provide suitable space for lichen propagules/spores to adhere and colonize between the gaps of thin fibres. The identification of the lichen species revealed the occurrence of both foliose and crustose lichens, *Bulbothrix setschwanensis* (Zahlbr.) Hale, *Candelaria concolor* (Dicks.) Arnold, *Lecanora* sp., *Physcia dilatata* Nyl. and *Punctelia subrudecta* (Nyl.) Krog. Out of the five lichen species, *Bulbothrix setschwanensis* has never been reported before inhabiting plastic net house.

The presence of lichens on nylon net structures offers numerous ecological benefits, positively impacting the surrounding ecosystem. They support biodiversity by providing microhabitats for various small organisms, contribute to UV radiation protection, stabilize soil to prevent erosion, and serve as indicators of environmental quality. In addition to their ecological significance, lichens growing on nylon net structures add aesthetic value, enhancing the visual appeal of the area for inhabitants and visitors alike.

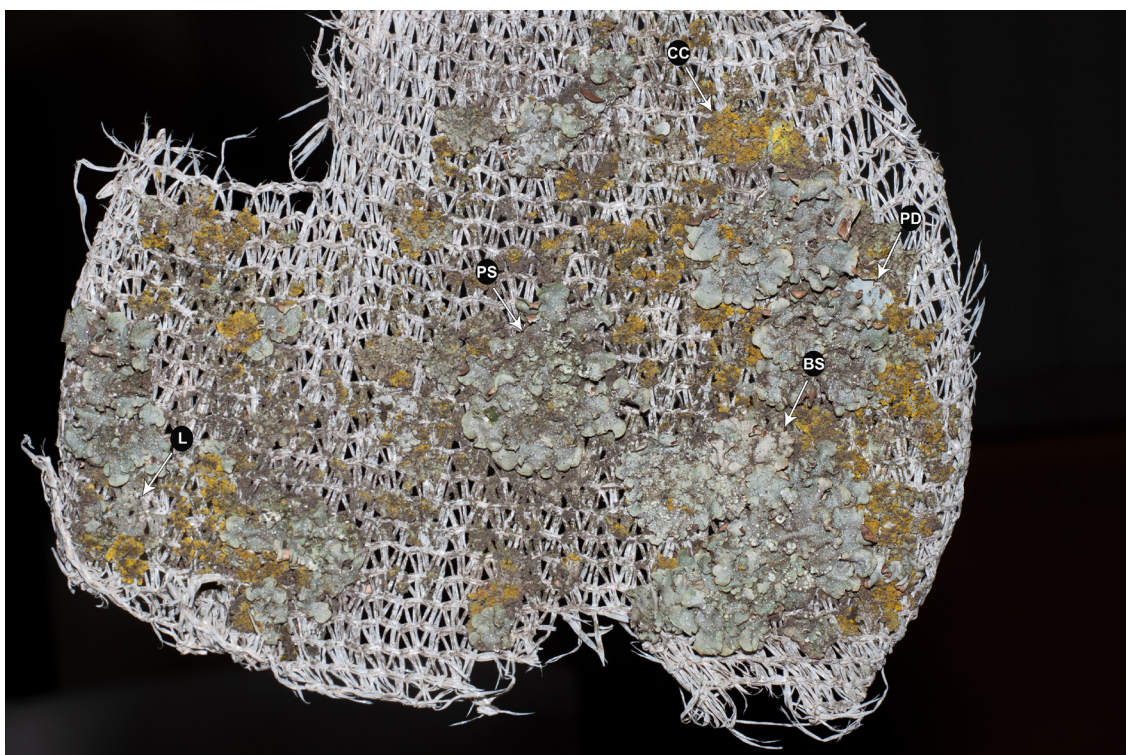


Figure 1: A piece of nylon net house with lichen colonization. Note: BS = *Bulbothrix setschwanensis* (Zahlbr.) Hale; CC = *Candelaria concolor* (Dicks.) Arnold; L = *Lecanora* sp.; PD = *Physcia dilatata* Nyl.; PS = *Punctelia subrudecta* (Nyl.) Krog.

Studying lichens on artificial substrates is vital for their conservation, as man-made objects can serve as suitable habitats for these organisms, contributing to biodiversity conservation. Understanding their growth on artificial substrates can contribute to their conservation efforts and provide insights into potential interactions between lichens and synthetic materials. It also raises questions about potential degradation of plastic by lichen colonization, which merits further research.

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Upadhyay S, Bisht K, Chandra K (2020) Further additions to the plasticolous lichens from India. *National Academy Science Letters* 43: 647–649.

Upreti DK, Dixit A (2002) Lichens on plastic net. *British Lichen Society Bulletin* 90: 66–67.



LEUCODERMIA BORYI (FÉE) KALB - Photo by Arun Christy Sebastian (Project Fellow, Forest Botany Department, KSCSTE-Kerala Forest Research Institute, Thrissur, Kerala)
Locality: Kerala, Idukki district, Munnar.

I AM LICHEN

Nodal Jigyasa: Dr. Vivek Srivastava Concept & script: Dr. Sanjeeva Nayaka
 Facilitation: Director, CSIR-NBRI Artist: Mr. Anil Singh

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Hi, I am fungus, I can't prepare my food

Hi, I am alga, I have chlorophyll, I can prepare my food through photosynthesis

Hey alga...! Will you be my friend ?

Well.....! What can you do for me ?

I will shelter you inside my body, I will supply water and nutrition to you, bla, bla.... bla

Really...! you are so sweet..

Come on alga let me hug you

Hey..... What is happening ? We both are changing

Oh!

Now I am lichen

Alga you have given me tremendous capabilities, now I can live on bark, rock, leaf, soil, moss....



I can tolerate freezing temperature

I can tolerate bright Sun and UV light

I produce more than 1000 secondary metabolites

I am used as medicine

I give pleasant aroma to cuisines as spice

I am used for perfume production

I am used for litmus paper preparation

I am food for insects and snails

I am a favourite food of Reindeers

I have numerous shape, size and colour, but I can be grouped into 3 categories, crustose, foliose, fruticose

But I am sensitive to air pollution

My community is in threat due to over exploitation

People please save me...! My life is important

LICHEN COMICS (Concept & Script: Dr. S. Nayaka, Artist: Mr. Anil Singh) produced for the Jigyasa programme by CSIR-National Botanical Research Institute, Lucknow (Reproduced with permission of the publisher).

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रंग बिरंगे शैक हमारे अखिलेश कुमार मौर्य एवं गौरव कुमार मिश्र

रंग बिरंगे शैक हमारे, लगते हैं कितने प्यारे ।

पीले भूरे लाल सुनहरे, पूरे जगत में हैं न्यारे ॥

पर्वत राज हिमालय इनका, मुख्य वास स्थान है ।

सभी वनस्पतियों में इनकी, खास अलग पहचान है ॥

मुख्य आकृति तीन तरह की, सतहों पर पायी जाती है ।

तना इमारत पत्ती डाली, पत्थर या माटी में पायी जाती है ॥

कुल भोजन शैवाल बनाती, कवक सुरक्षा करता है ।

सहजीवन सा इनका जीवन, हर पल ऐसे चलता है ॥

पेंडों पत्थर और धरा के, ऊपर पाये जाते हैं ।

पोषक तत्वों से भरपूर, भोजन में खाये जाते हैं ॥

मानव अंगों के साथ, ये समरूपता दर्शाते हैं ।

डॉक्टोराइन सिगनेचर से ये, जन जीवन बचाते हैं ॥

इनके अंदर उपापचय हैं, गुण वर्धक औषधियों के ।

रोगी काया बने निरोगी, हल है सभी व्याधियों के ॥

खराब मिट्टी खराब मौसम, हर जगह पर ये उगते हैं ।

इनसे जो रंग निकलते हैं, कई तरह के रेशों को रंगते हैं ॥

दूषित वातावरण में यह, स्वतः ही गायब होते हैं ।

शुद्ध जगह की शुद्ध हवा में, स्वतः ही फलते बढ़ते हैं ॥

आयुर्वेदिक ग्रंथों में कई, नामों से इनको जाना जाता है ।

शैलेय शैलजा शिलापुष्प, आदि से पहचाना जाता है ॥

REPORT

Dr. D.D. Awasthi Centenary Celebration and International Conference on Multi-disciplinary approaches in lichenology (Hybrid mode)

Jointly organized by

Indian Lichenological Society, Lucknow and CSIR-National Botanical Research Institute, Lucknow

Date: September 28-30, 2022

Venue: Auditorium, K.N. Kaul Block, CSIR - NBRI

Preamble: Lichenology has evolved over the years not only in India but also globally by integrating modern tools and techniques. The lichenologists worldwide are engaged in diverse aspects ranging from discovery novel taxa or metabolites to medical, environmental and space science. In India, Dr. D.D. Awasthi who is considered as “Father of Indian Lichenology” initiated research on lichens and his contributions is recognized globally. To honor him on his birth centenary, the Indian Lichenological Society (ILS), a globally recognized scientific society in collaboration with CSIR – National Botanical Research Institute, Lucknow organized a three-day international conference on “Multidisciplinary Approaches in Lichenology” during September 28-30th, 2022. The primary aim of the conference was to recall the journey of lichenology in India and to explore the future scope. The conference was conducted through hybrid mode where the participants from India attended through physical mode only (in person), whereas foreign nationals attended through online mode as per Indian Standard Time. Dr. Gaurav K. Mishra was the Organizing Secretary of the conference. In total, 100 persons actively participated in the conference.

Inauguration: Prof. Chakravartula Manoharachay, NASI Senior Scientist, Osmania University, Hyderabad was the Chief Guest and Prof. S.K. Barik, Director of CSIR-NBRI presided over the inaugural program. A souvenir containing 105 abstracts was released on this occasion. Dr. D.K. Upreti, President of the ILS, presented an introduction to Dr. Awasthi while Dr. G.K. Mishra, Secretary of ILS, talked about the origin of the conference. The 2nd issue of the 6th volume of [6(2) 2022] of the journal ‘Cryptogam Biodiversity and Assessment’ was released as the Dr. D.D. Awasthi Birth Centenary Issue on this occasion. The issue includes a total of 10 articles contributed by 23 authors. Dr. S. Nayaka, Co-convenor of the conference, presented the vote of thanks.

Technical sessions: The technical sessions included deliberations on ten major themes which focused on the emerging trends in lichenology in India vis-à-vis the global scenario. The three-day conference included much discussion by ILS Fellows and delegates, with 47 oral (including keynote talks, lifetime achievement talk, fellows talk, invited lectures and oral presentations) and 20 poster presentations. A total of seven delegates from outside India presented their work; most prominent among them was Dr. François Lutzoni of Duke University, North Carolina, who spoke about ‘what are the mechanisms driving lichen mycobiont-photobiont interactions’.

Fellowship and awards: The ILS also bestowed Dr. D.D. Awasthi Lifetime Achievement award to Dr. D.K. Upreti for his outstanding contribution to Lichenology. Further, ILS also awarded its 13 Life Members with ‘Fellowship of Indian Lichenological Society’. Mr. Sachin V. Mapari, Agarkhar Research Institute, Pune and Ms. Shweta Sharma, CSIR-NBRI, Lucknow won the Dr. Ajay Singh Award for best posters. Ms. Sapraja Saha, University of Calcutta, Kolkata; Ms. Jyotsna Chakrawarthy, CSIR-NBRI, Lucknow; and Ms. Alina Shreshta, Tribhuvan University, Kirtipur, Kathmandu all won the P.G. Patwardhan Award for best oral presentation.

Valedictory: In the valedictory function of the conference, Dr. G.P. Sinha, Ex. Additional Director, Botanical Survey of India, Allahabad and Prof. P.K. Divakar from University of Complutense, Madrid was present as Chief Guests along with Drs. D.K. Upreti, G.K. Mishra and S. Nayaka.

Recommendations:

Overall there were several recommendations during the conference which can be summarized as follows - 1. The conferences dedicated to lichens are rare and such events should be organized frequently. 2. Lichens represent almost 20% of the total plant diversity (excluding virus and bacteria) in India, therefore they must be given due credit in terms of encouraging research and conservation. 3. Taxonomic studies on lichens must be strengthened by liberal funding and job opportunities. 4. Basic research must also accompany applied research such as molecular taxonomy and bioprospecting. 5. Young research should be attracted to take up lichen research by modernizing the area by incorporating applied aspects. 6. Quantitative ecological studies should be carried out for lichens, which would help in assessing the conservation status of the taxa. 7. The ecosystem services and economic importance of lichens should be utilized sustainably, 8. The lichens indicator species should be included in the policy documents of government for better assessment of environment quality. 9. Achievements of lichen researcher should be recognized at national level by awards and felicitations.

List of 'Fellows of Indian Lichenological Society' awarded during the conference.

1. Dr. K.P. Singh, BSI, Allahabad
2. Dr. D.K. Upreti, CSIR-NBRI, Lucknow
3. Prof. Jayashree Rout, Assam University, Silchar
4. Dr. Bhaskar C. Behera, ARI, Pune
5. Dr. Pradeep Kumar Divakar, Complutense University of Madrid, Spain
6. Dr. Sanjeeva Nayaka, CSIR-NBRI, Lucknow
7. Dr. T.A.M. Jagadeesh Ram, BSI, Coimbatore
8. Dr. P. Ponmurugan, Bharathiar University, Coimbatore
9. Dr. Brahma N. Singh, CSIR-NBRI, Lucknow
10. Dr. Gaurav K. Mishra, CSIR-NBRI, Lucknow
11. Dr. Rajesh Bajpai, CSIR-NBRI, Lucknow
12. Dr. Vertika Shukla, BBAU, Lucknow
13. Dr. Himanshu Rai, BHU, Varanasi

Details of technical sessions

Date: 28-09-2022 (1st Day) 14:00 – 18:00 hrs

REGISTRATION - 14:00-15:00 hrs

INAUGURATION SESSION - 15:00-16:00 hrs

KEYNOTE ADDRESS

1. Prof. C. Manoharachary - Climate Change and Lichens
2. Dr. K.P. Singh - Indian lichen herbaria and their significance

Date: 29-09-2022 (2nd Day)

LIFETIME ACHIEVEMENT AWARD LECTURE

1. Dr. D.K. Upreti - ORecent development in Lichenological research from India

ILS FELLOWS LECTURES

1. Dr. Jayashree Rout - Lichens of Northeast India – potential for bioprospection
2. Dr. Sanjeeva Nayaka - Revision of some crustose lichen genera from India
3. Dr. T.A.M. Jagadeesh Ram - Lichen family Pyrenulaceae in India
4. Dr. B.N. Singh - Herbal nanotechnology: an emerging approach to develop advanced biomaterials from lichens for superior biomedical applications.
5. Dr. Gaurav K. Mishra - Taxonomic revision of Cetrarioid lichens (Parmeliaceae) From India.
6. Dr. P. Ponmurugan - The evaluation of nutraceutical properties of edible lichens using zebra fish as an experimental animal
7. Dr. Himanshu Rai - Green synthesis, characterization, and assessment of antimicrobial activity of silver phytonanoparticles of a high-altitude Himalayan lichen - *Cladonia rangiferina* (L.) Weber ex F.H. Wigg.
8. Dr. Rajesh Bajpai - Ameliorative potential of lichens for climate change studies: Erudition at alpine areas of Himachal Pradesh

9. Dr. (Mrs.) Vertika Shukla - Lichen metabolites and its environmental significance

INVITED LECTURES

1. Dr. Jaycee Augusto G. Paguirigan - Updates on the Philippine Lichen Research: Biodiversity and Bio-discovery.

2. Prof. Anupam Dikshit - Journey of Lichen research in Biological Product Lab. University of Allahabad: 1991-2022.

3. Dr. Pulak Das - Recent advances in the application of remote sensing in Lichenology

4. Dr. Dibyendu Adhikari - Applications of Geospatial and Ecological Niche Modelling Tools in Biodiversity Research

5. Dr. Shiva Devkota - Digitization of the Lichen Herbarium Collection: Lessons Learned and Methodological Insights from Nepal

6. Dr. Chitra Bahadur Baniya - Exploration of Nepali lichens

7. Dr. Manoj Semwal - Bioindicators for monitoring climatic variability in the Himalayas using Geospatial Tools and Techniques

8. Dr. Bharati Sharma - Floras & Inventories: A Tool for Biodiversity Studies for The New Era

9. Dr. Roshni Khare - Lichens heterogeneity in and around an alpine wetland landscape in Western Himalaya

10. Mr. Nishanth B. Bhat - Isolation and characterization of Lichen substances from *Ramalina nervulosa* & *Usnea sinensi*

11. Dr. Jatinder Kumar - Lichens potent chemotype to ameliorate hypoxia-induced

12. Dr. Pooja Gupta - Current Status of Lichen Diversity in the Himalaya

Date: 30-09-2022 (3rd Day)

INVITED LECTURES

13. Dr. François Lutzoni - What are the mechanisms driving lichen mycobiont-photobiont interactions?

14. Dr. Pradeep K. Divakar - Larger mitochondrial genome size positively linked to mutualistic fungal lifestyle

15. Dr. Rajkumar H. Garampalli - Bio-prospecting lichens for human welfare

16. Dr. Mamta Bhat - Lichen based entrepreneurship: opportunities and challenges

17. Dr. Nayan Sahu - Ecophysiological investigations on Lichens: Current Approaches

18. Dr. Alejandra Teresa Fazio - Isolation, culture and chemical analysis of aposymbiotic lichen mycobionts.

ORAL PRESENTATIONS

1. Mr. E.S.M. Edirisinghe - Isolation of photobiont and mycobiont partners from two selected lichen species in Sri Lanka

2. Dr. M. Senthilkumar - Bioprospecting of *Parmotrema reticulatum* (Taylor) Choisy, lichen from the Western Ghats for antimicrobial and antioxidant activities

3. Mr. Subhash Gaikwad - Antimicrobial Potential of Lichen Compounds

4. Ms. Jyotsna Chakarwari - Antimicrobial, antioxidant screening and chemical profiling of two endolithic fungi from *Parmotrema*

5. Mr. Roshinikumar Ngangom - Notes on the lichen genus *Amandinea* (Caliciaceae, Ascomata) in India

6. Mr. Ruchira Ramesh Sutar - Evaluation of Antioxidant Activity of Lichen Metabolites from Western Himalaya

7. Mr. Rachid Mouedden - Noteworthy lichens recorded in North Africa

8. Ms. Hina Saraswat - Lichens on some monuments of Rajasthan

9. Mr. Praphool Kumar - Antimicrobials activities of lichen *Ramalina conduplicans* Vain. against multi-drug resistance *Acinetobacter baumannii*

10. Ms. Alina Shrestha - Lichen Diversity in Khaptad National Park, Western Nepal

11. Ms. Sagarja Saha - In vitro screening and in silico docking analysis identifies a novel compound Atranorin from *Parmelinella wallichiana* exhibiting potent anti-hepatocarcinoma activity.

12. Dr. Anushree Baruah - Assessment of bioactive molecules and antimicrobial activities in lichens species of Golaghat District of Assam, India.

13. Ms. Shweta Bharti - Silver nanoparticles of *Roccella montagnei* showed anticandidal activity against Fluconazole (FCZ)-Resistant *Candida albicans* and inhibit virulence factors

14. Dr. Balasubramanian - Therapeutic influence of *Parmotrema tinctorum* extracts on scopolamine induced Alzheimer's disease in albino wistar rats.

15. Dr Anil Kumar A K - Lichenicolous fungi associated with *Drinaria*, *Parmotrema* and *Rocella*.

16. Dr. Arvind Prajapati - Recolonization of lichens in the abandoned BALCO and HINDALCO Bauxite mines of Amarkantak

17. Ms. Kirti Kumari - Biomonitoring of air pollution in Lucknow City, Uttar Pradesh, using lichenized fungi *Pyxine coccinea* (Sw.) Nyl. transplant technique

VALEDICTORY SESSION - 17:00-18:00 Hrs





A. Inauguration of the conference by lighting the lamp by dignitaries, **B.** Prof. S.K. Barik, Director, CSIR-NBRI welcoming the guests, **C.** Dr. G.K. Mishra, Organizing Secretary giving the details of the conference, **D.** Dr. S. Nayaka, Convener of the conference announcing the Dr. D.D. Awasthi Memorial Lifetime Achievement award and Fellowship of ILS, **E.** Dr. D.K. Upreti, President of ILS receiving the Lifetime achievement award, **F.** Dr. K.P. Singh, Ex-Director, BSI, Allahabad receiving Fellow of ILS, **G.** Dr. P.K. Divakar, University of Complutense, Madrid, and **H.** Prof. C. Manoharachary, NASI Senior Scientist, Chief Guest of the function delivering his inaugural address.

Indian Lichenological Society - Membership information

Currently the society offers following three types of membership;

Ordinary membership

Ordinary membership is open to all individuals interested in any aspect of Indian Lichenology. The ordinary membership fee is Rs. 1000 (rupees one thousand only), valid only for the calendar year (January to December) in which the fee is deposited. The fee may be deposited anytime.

Life membership

Life Membership is open to all individuals interested in any aspect of Indian Lichenology. The Life Membership fee is Rs. 4000/- (rupees four thousand only). The fee may be paid at anytime and the membership remains valid till death of the individual or till the individual wishes to withdraw their membership from the society.

Honorary membership

Honorary Members are selected by Executive Council on the merits of the individual. No fee is levied for Honorary Membership.

Note: Membership fee is not refundable in any case.

Member's privileges

All members have right to provide feedbacks and contribute in any manner, at any time for the better management of the society and advancement of Lichenology in the country.

All members are eligible to participate and express their views in the society meetings.

Only Life Members are eligible for voting in the election of Executive Council members.

All members are can publish their articles in the society's Journal. However, the members are required to follow the journal's terms and conditions.

All members would have free access to databases of the society. However, this clause is subjected "conditions" that would set when the databases are actually developed.

The Life Members of society would be awarded or designated as 'Fellow of the Indian Lichenological Society (FILS)' after the completion of three year of their membership. The fellowship include certificate or citation only.

The Life Members and Honorary Members of the society are eligible for receiving awards constituted by the society.

Termination of membership

The Life Membership and Honorary Membership gets terminated in the event of death of the member or resignation.

As mentioned earlier Ordinary Membership gets terminated after 31st of December every year, and may be extended after payment of the dues.

Applications for membership

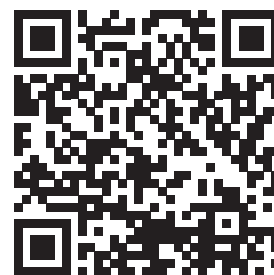
All the applications should be made through the Society's website where the online application form is provided:

<https://www.indianlichenology.com/MemberShipForm.aspx>

Payment of fee

Account No.: 34349534762; Name: Indian Lichenological Society; Bank: State Bank of India; Branch: NBRI Lucknow (10173); IFS Code: SBIN0010173; MICR Code: 226002051

Note: Out station of cash deposit as fee is not allowed for society's account. However, money transfer by swiping your debit/credit card is possible. There would be no or minimal charges for money transfer through internet banking (NEFT) which may be collected from transferee's account



Scan the QR code for the online application form

PUBLICATION GUIDELINES

ILS eLetter accepts writings, artworks, news, advertisements, and photographs pertaining to lichens and lichenicolous fungi. Articles can be either in English or Hindi. Popular articles, reviews, notes, observations, book reviews, poems, recommendations/suggestions are welcome. All the contributions will be peer-reviewed.

Submissions can be sent to: editorilseletter@gmail.com

Manuscript format guidelines:

1. Manuscript should be typed in word format without any fancy type setting.
2. Abstracts and keywords are not required.
3. Manuscript should include author details: names(s), affiliation(s), address and valid email.
4. All scientific binomials should be *italicized*.
5. Citations in the text should be arranged chronologically and separated by comma. For citations with more than two authors, use surname of first author followed by *et al.* E.g. (Singh 1998, Awasthi 2007, Singh & Sinha 2010, Nayaka *et al.* 2016).
6. References cited in the text should be listed alphabetically and quoted at the end of the manuscript.
7. Photographs, diagrams, charts, drawings files should be prepared in Jpeg (at least 300 dpi), TIFF or PNG formats. Editing of images is strongly discouraged.

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