

## **Certificate Course on “Mushroom (Macrofungi) identification and need for their conservation in natural habitats”**

### **Introduction**

The multicellular fungi are the early evolved life forms having a rich diversity of about 5.1 million species. They occupy terrestrial and aquatic habitats with synergistic relationships with algae (lichens), plants (mycorrhiza) and cyanobacteria. Fungal pathogens act as antagonists causing diseases in plants, animals and human beings.

The ecosystem functions of fungi are remarkable being decomposers of organic matter, their active role in carbon sequestration, nutrient cycling in biogeochemical cycles and nutrient transport. The economic importance of fungi for humans, ranges from being direct food sources like mushrooms and their application in brewing, baking, fermentation, pharmaceutical, dyeing industry, enzyme synthesis and even in leather production.

Soil dwelling immobile fungi were once considered as plants. But they lack stamen/pistil, chlorophyll, flowers and seeds and reproduce through spores. The presence of cell wall components similar to insects prompts them to be included among animals rather than plants. The categorisation of fungi among plants (flora) or animals (fauna) creates ambiguity.

Overexploitation of land, forests, climate change, pollution and overharvesting of mushrooms creates threat in their existence adding up to biodiversity loss. Unlike flora and fauna, fungi being overlooked in policy frameworks including international conventions like Conservation for Biological Diversity, lacks any legal protection in its conservation aspects. Vulnerability of fungi towards extinction hence remains unnoticed in the scientific world. IUCN Red list data were widely used as a tool for setting national, regional and global priorities for nature conservation actions.

Globally only 425 fungal species are enlisted in the IUCN red list which constitute 0.01% of its diverse species. Hence there's an urgent need to acknowledge the fungal ecosystem services and make policies for its conservation in natural habitats on a community approach.

### **Aim of course**

Kerala State Biodiversity Board is organising the course for creating awareness among the young generation about the mushrooms, the fruiting bodies formed by macrofungi. The course aims at sensitising students about the innumerable ecosystem services offered by this neglected yet remarkable life form. Inspiring the students to get closer to nature, observe the rich species diversity among fungi and involve in participatory science and research meant for fungal conservation in natural habitats are the expected outcomes.

## Who can apply?

The course is meant for **ongoing graduate** and **postgraduate students** studying biology, chemistry, physics, mathematics/statistics, food science, geology and home science who are interested in knowing about fungi, identification of fungi in their natural habitats and conservation aspects that can be undertaken locally. The medium of the course will be in English.

Prospective students can apply until June 30<sup>th</sup>, 2022!

## Selection of students for course

Online registration can be done using the link available in the website or brochure. The prospective students have to upload

- Motivation letter for joining the course (max.500 words)
- Scanned copy of proof of study certificate from Head of department of college in letter head.

The students will be chosen based on their motivation letter and **shortlisted 25 candidates** form a batch. Selected students will be intimated on **30<sup>th</sup> June, 2022**.

## Course fee and payment options

Payment of fees must be done within 2 weeks from the commencement of the course. The fee amount is Rs.1000 (Rupees One Thousand only). The amount may be encashed to KSBB bank account and a scanned copy of the receipt should be mailed to official email Id [keralabiodiversity@gmail.com](mailto:keralabiodiversity@gmail.com). Details required for payment are as follows.

Bank Account number: 0889102000003360

IFSC: IBKL 0000889

Name of Bank: IDBI Karamana Branch

## Course details and syllabus

Mode of classes - **Online**

Duration of a class - **1.5 hours**

Days per week - **Friday & Saturday**

Time - **7-8.30 pm**

Total hours - **32**

Start date - **July 1, 2022**

End Date - **September 10, 2022**

Course co-ordinator: Dr.Yamuna.S, Principal Scientific Officer, Kerala State Biodiversity Board.

Course co-ordinator, who is also an alumnus of Max Planck Institute for Chemical Ecology in Jena, Germany deals with 75% of the classes. The remaining 25% classes will be covered by faculty from national and international arenas who are mycology experts. The final schedule of course with names of resource persons will be directly communicated to the registered students.

20 marks each was assigned for every unit which would be assessed based on objective/subjective tests after completion of the unit. A total of 5 assignments must be completed and submitted each after every unit of study, in the form of reports with illustration from field visits in local mushroom habitats, proper documentation and submission of collected samples, identification of fungi using online platforms or notes on selected topics. Every assignment should be submitted within the time limit prescribed for each.

**During the two days of offline interactions, students will get an opportunity to visit mushroom herbarium at Jawaharlal Nehru Tropical Botanical Garden and a trekking to identify and collect mushroom samples from forest areas.**

**Syllabus for graduate and post graduate students (ongoing)**

Unit 1.	<ul style="list-style-type: none"> <li>● Introduction on fungi - Microfungi, Macrofungi.</li> <li>● Fungal classification- chytridiomycota, zygomycota, basidiomycota, ascomycota, glomeromycota</li> <li>● History- human use and economic importance</li> <li>● Environmental and cultural conditions for growth</li> <li>● Fungal- plant/animal/human interactions</li> <li>● Applications and commercial exploitation of fungi</li> <li>● Extinction risks, role of biodiversity management committees and biodiversity boards, access benefit sharing, people's biodiversity register.</li> </ul>	<b>3 hours (20 marks)</b>
Unit 2	<ul style="list-style-type: none"> <li>● Role of fungi in nutrient cycling and ecosystem services</li> <li>● Phenology and climate based changes in fungal habits and habitats</li> <li>● Hotspots of fungal biodiversity in Kerala &amp; India</li> <li>● Research institutions on fungal studies and conservation within India and abroad.</li> <li>● Need for conservation of fungi in ensuring biodiversity</li> </ul>	<b>3 hours (20 marks)</b>

Unit 3	<ul style="list-style-type: none"> <li>● Identification of macrofungi - traditional and molecular methods</li> <li>● Morphology, life cycle</li> <li>● Collection, documentation, preservation aspects for the long term, botanical gardens preserving fungi</li> <li>● Microscopic structures- spores, size, shape, chemical tests</li> </ul>	<b>3 hours (20 marks)</b>
Unit 4	<ul style="list-style-type: none"> <li>● IUCN red-listing criteria, assessing, reporting vulnerable fungal species</li> <li>● Online platforms and Social media networks for fungal identification</li> <li>● Conservation aspects of fungi around the globe</li> <li>● Citizen science and participatory research approaches in fungal conservation</li> </ul>	<b>3 hours (20 marks)</b>
Unit 5	<ul style="list-style-type: none"> <li>● CBD, Fungal conservation forums, national register of fungi, funding sources</li> <li>● IUCN-red listing of fungi- India-2019-2020-progress</li> <li>● Earth biogenome project</li> </ul>	<b>3 hour (20 marks)</b>
<b>Assignments (5 no.s)</b>		<b>100 marks</b>
<b>Total</b>		<b>200 marks</b>

### **Other guidelines**

- Students should get prior consent from KSBB regarding publication of any information regarding the course or that included in course material, on their own.
- The content of study material is the property of KSBB and hence students who attend the course are instructed not to share the study material or video recording of the online classes without consent from KSBB.
- KSBB has the right to bring changes in the certificate course as per the arising needs.

Dr. Santhoshkumar A.V.  
**Member Secretary**