

MAHATMA GANDHI UNIVERSITY

B.Sc. BOTANY PROGRAMME

Semester V Course-5

B05B05U

MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY

(Theory: 36 hours; Practical: 45 hours)

(Theory Credit 2, Practical Credit 2)

Course Objectives

Enable the student to

1. Understand the diversity of fungal and lichen world and its significance.
2. Understand the various plant diseases and their impact on agriculture.
3. Familiarize with the various measures adopted to control plant diseases.

I MYCOLOGY

(Theory 24 hours; Practical : 36 hours)

Module 1

15 hours

1. Introduction , structure, reproduction, life cycle, evolutionary trends.
Classification based on Ainsworth (1973)
2. Distinguishing characters of different classes of fungi with special reference to reproductive structures and life history of the genera mentioned in each group
 - a) Myxomycotina – General Characters
 - b) Mastigomycotina – *Albugo*
 - c) Zygomycotina - *Rhizopus*
 - d) Ascomycotina
 - * Hemiascomycetes -- *Saccharomyces*
 - * Plectomycetes -- *Pencillium*
 - * Pyrenomycetes – *Xylaria*
 - * Discomycetes -- *Peziza*
 - e) Basidiomycotina
 - * Teliomycetes ---*Puccinia*
 - * Hymenomycetes—*Agaricus*
 - f) Deuteromycotina – *Fusarium*

Module 2

7 hours

1. Economic importance of Fungi –useful and harmful aspects.
2. Fungi of Agricultural importance –mycoherbicides, myconematicides , mycoparasites , Mycorrhiza –diversity , function and significance.
3. Fungal biotechnology- Fundamental principles.
Mushrooms- edible and poisonous types.
cultivation technique-Spawn production .
Cultivation of Oyster mushroom.

II LICHENOLOGY

2

hours

Module 1

General account , economic and ecological importance of lichen
Structure, reproduction and life cycle of *Parmelia*.

PRACTICALS

36 hours

1. Students are expected to identify the following types by making suitable micropreparations and make labeled sketches *Rhizopus* , *Albugo* , *Saccharomyces*, *Pencillium* , *Xylaria*, *Peziza*, *Puccinia*, *Fusarium* and *Parmelia*.
2. Isolation and culture of Oyster mushroom mycelium.
- 3 Preparation of bed for mushroom cultivation.
4. Staining of endomycorrhiza / fungus.
5. Isolation of fungus from dung, air ,fruits ,vegetables.
6. Slide culture technique of fungus.

III PLANT PATHOLOGY

(Theory 12 hours; Practical : 9 hours)

Module 1

4 hours

History of plant pathology, Classification of plant diseases on the basis of causative organism and symptoms , Host parasite interaction , Defense mechanism in host ,Mechanism of infection, transmission and dissemination of diseases.

Module 2

2 hours

Control of plant diseases –

Prophylaxis-quarantine measures, seed certification

Therapeutic – physical therapy , chemotherapy.

Biological control.

Module 3

5

hours

Study of following diseases with emphasis on symptoms, disease cycle and control

Bunchy top of Banana.

Bacterial blight of Paddy.

Root wilt of Coconut.

Abnormal leaf fall of Rubber .

Fungicides - Bordeaux mixture, Tobacco Neem decotion, preparation. (Brief account only)

Module 4

1 hours

Medical mycology- Mention about fungal infections of man – Fungal allergens Athlete's foot, aspergillosis, candidiosis, aflatoxin

Practicals

9 hours

Students are expected to :

1. Identify the diseases mentioned in the syllabus with respect to causal organisms and symptoms
2. Submit herbarium preparations of various stages (3stages) of any one of the diseases mentioned.
3. Students should be trained to prepare the fungicide – Bordeaux mixture, Tobacco decotion .

Suggested Additional Topics

Fungal ecology- details of fungal decomposition of organic matter , coprophilous fungi, cellulolytic fungi, lignin degrading fungi ,details of wood decay. soil fungi
Plant diseases, Role of enzymes in pathogenesis.

References :

1. Ahamadjian Vernon and Hale M.E (eds) 1973. *The Lichens* , Academic press, New Delhi.
2. Ainsworth G.C ., Sparrow K.F & Sussman A.S (eds) 1973. *The Fungi an advanced Treatise* ,Vol. 4 a & 4b, a Taxonomic review with keys , academic press New York.
3. Alexopaulos C.J, Mims, C.W & C.W Blackwell,M 1996 *Introductory Mycology* .John Willy and sons, INC . New York.
4. Bilgrami K.S and Dube H.C 1976 *A Text book of Modern Plant pathology* ,: Vikas
5. Campbell R 1987 *Plant Microbiology* , ELBS Edward Arnold , London .
6. George N. Agrios 1988. *Plant Pathology*, Academic Press Ltd., London.
7. Greth Jones,D 1989 *Plant Pathology –Principles and Practice* , Aditya books, New Delhi.
8. Gupta V .K & Paul T.S 2004, *Fungi & Plant deseases*. Kalyani publishers , New Delhi
9. Hale M.E 1983 *The Biology of Lichen*,3rd edition Edward Arnold, London.
10. Jim Deacon 2007 *Fungal Biology* , 4th edition , Blackwell Publishing ,Ane Books Pvt. Ltd.
11. Jim Deacon, 2007. *Fungal Biology*. Black Well Publishing.
12. Krishnamurthy K.V. 2004. *An Advanced Text Book on Biodiversity Principles and practice*. Oxford and IBH Publishing Co. Pvt. Ltd.
13. Malhotra & Aggarwal Ashok 2003 *Plant Pathology*, Tata Mc Graw Hill Publishing Co

14. Mamatha Rao, 2009, *Microbes and Non flowering plants- impact and application*
Ane Boopks Pvt Ltd.
15. Misra A and Agrawa P.R 1978 *Lichens* ,New Delhi : Oxford and IBH.
16. Nair M.C (eds) 1990 *Mushroom Technical Bulletin 17* , Kerala Agricultural University
Mannuthy
17. Nita Bahl 2002. *Hand book on Mushrooms*, Oxford & IBH Publishing C. Pvt. Ltd.
New Delhi.
18. Sharma P.D 2004 , *The Fungi* , 2nd Edition , Rasthogi publication
19. Singh, Pande Jain 2007, *Diversity of Microbes and Cryptogam*, Rastogi
Publications.
20. Tripathi D.P 2005. *Mushroom Cultivation*, Oxford & IBH Publishing Co. Pvt.
Ltd. New Delhi.
21. Vasishta B.R !990 *Botany for Degree Students* , Fungi S. Chand &Co, NewDelhi.
<http://www.fungibank.csiro.au/>
<http://www.in2.dk/fungi/imageintroTxt.htm>
<http://www.fungi4schools.org/>
<http://www.fungiphoto.com/>
<http://www.britmycolsoc.org.uk/> (British mycological society)
<http://www.mycology.com/>
<http://www.bgbm.fu-berlin.de/sipman/keys/default.htm> (lichen)
<http://www.bspp.org.uk/>
<http://www.fs.fed.us/r6/nr/fid/coolpath.shtml>
<http://fruit.wsu.edu/>
<http://www.apsnet.org>