



Paper 2a MYCOLOGY AND PLANT PATHOLOGY

M. Sc. va. (Candidates admitted from academic year 2008-2009)

Core Theory

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Mycology

UNIT I

A general account of fungi, their nature, distribution, structural variation, development, modes of reproduction, patterns of life cycle. Classification of fungi as given by Ainsworth. A critical reference to the position of fungi in recent classification of the plant and other kingdoms, characteristic features of Myxomycota, Mastigomycotina, Zygomycotina, Ascomycotina, Deuteromycotina, Basidiomycotina.

Key words: Saprobe, mycelia, dimorphic, rhizomorphs, necrotrophs, biotrophs, haustoria, holocarpic, eucarpic, aplanospore, zoospore, heterokaryon, homokaryon, Monophyletic, polyphyletic, pleomorph, holomorph, plasmodium, capillitium, peridium, myxamoebae, swarm cells, protoplasmodium, aphanoplasmodium, macrocysts, zygospore, sporangiola, azygospores, ascus, trichogyne, coridia, basidium, basidiocarp, hymenia, mycophagy, spawn.

UNIT II

Occurrence, distribution, somatic structure, distribution and modes of reproduction with special reference to sexuality in Myxomycetes, plasmodiophoromycetes, Chytridiomycetes, oomycetes, Zygomycetes.

A study of characteristics of

Ascomycotina: Hemiascomycetes, Plectomycetes, Pyrenomycetes, Discomycetes, laboulleniomycetes, loculoaxomycetes.

Basidiomycotina: Teliomycetes, Hymenomycetes Gasteromycetes.

Deuteromycotina: Coelmycetes, Hyphomycetes. A general knowledge of heterothallism, parasexuality and hormonal mechanism of sexual reproduction.

Key words: Secondary homothallism, bipolar heterothallism, 3. tetrapolar heterothallism, hermaphroditic, dioecious.

UNIT III

Lichen: Fungi involved & reproduction. lichen & environment.

Mycorrhizae – Ectomycorrhizae, AM fungi & its use in agriculture.

Key words : Soredia, isidium, phycobiont, mycobiont, crustose, fruticose, foliose, vesicles, arbuscules, biofertilizer.

UNIT IV

Fungal Biotechnology:

Industrial uses of fungi in fermentation technology, enzyme production, Citric acid production.

Commercial exploitation of fungal metabolites.

Key words: Mycotoxins, metabolites.

Plant Pathology

UNIT V

A General account of plant diseases caused by fungi, bacteria & viruses. Causes of plant diseases, Mechanism of infection; inoculum potential, penetration, infection, factors governing infection. Symptoms and identification of plant diseases. Host – parasite interaction: Effect of infection on the physiology of the host, role of toxins in pathogenesis.

Key words: Pathogen, Parasite, Infection, Incubation period, Endemic, Epidemic, Sporadic, Viroids. Mildew, rusts, smut, blisters, scab, Exudation, Galls, hypertrophy, atrophy, necrosis, canker, Blight, wilt.

UNIT VI

Defense mechanism in plants. Effect of environment on pathogenesis. Principles of plant disease management. Control by cultural practices. Biological control of pathogens. Genetic methods. Control by fungicides, protectant and systemic fungicides.

Key words: Inoculum, resistance, antibiotics, crop rotation, mixed cropping, selection, mutation, hybridization.

Suggested Reading

AINSWORTH, G.C., F.K. SPARROW, AND A.S. SUSSMAN (Eds.). 1965 - 1975. The fungi and advanced treatise. Vol. I - IV. G.L. Academic press, New York and London.

AINSWORTH, G.C. 1971. Ainsworth and Bibsy's dictionary of fungi. 6th Edition. Commonwealth Mycological Institute, Kew. U.K.

ALEXOPOLOUS, C.J and C.W. MISRA. 1972. Introductory mycology. John Wiley and Sons, New York.

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- BURNETT, J.H. 1976. Fundamentals of mycology. Edward Arnold Publishers, London.
- COOKE, W.B. 1979. The ecology of fungi. C.R.C. Press. Inc., Florida.
- GRAY, W.D. 1959. The relation of fungi to human affairs. Henry Bolt and Company, Inc., New York.
- HAWKSWORTH, D.L., B.C. SUTTON, AND G.C. AINSWORTH. 1983. Ainsworth & Bisby's Dictionary of the Fungi. 7th Edition. Commonwealth Mycological Institute. Kew. England.
- MARGULIS, L., AND K.V. SCHWARTZ. 1988. Five Kingdoms. W.H. Freeman and Co. New York.
- MORRE - LANDECKER. 1972. Fundamentals of the fungi. Prince Hall Inc, New Jersey.
- SUBRAMANIAN, C.V. 1971. Hyphomycetes. ICAR Publications, New Delhi.
- SUBRAMANIAN, C.V. 1983. Hyphomycetes, taxonomy and biology. Academic press, Inc., New York.
- TALBOT, P.H.B. 1971. Principles of fungal taxonomy. Macmillan Press Ltd, London.
- WEBSTER, J. 1970. Introduction to fungi. Cambridge University Press, London.
- MEHROTRA, R.S. 1980. Plant pathology. Tata McGraw Hill Publishing Company Ltd, New Delhi.
- SINGH. R.S. 1980. Introduction to Principles of Plant Pathology. III - Edition. Oxford. IBM. Publishing Co. Pvt. Ltd, New Delhi.