

Semester- IV
Course MI-204
Microbial Biodiversity

Unit I. Introduction

1. What is biodiversity? (1 hr)
2. Origin of life, evolution and origin of biodiversity, species concept (3 hr)
3. Evolutionary tree of microorganisms (3 hr)
4. Value of biodiversity, microbial biodiversity as index of environmental change (3 hr)

Unit II. Methods of Assessing Biodiversity

1. Microscopic methods (3 hr)
2. Cultural methods (4 hr)
3. Molecular and genomic methods: Molecular context of microbial diversity, importance of DNA and rRNA sequence comparison, determination of GC content (3 hr)

Unit III. Biodiversity among Bacteria & Archaea

1. Morphological and cellular diversity (4 hr)
 - A. Diversity in major cell shape and grouping
 - B. Diversity in ultra structure of cell with reference to cell envelope, cell membrane, cell wall, surface appendages, other cell organelles and spore.
2. Physiological and metabolic diversity (4 hr)
 - A. Diversity in photosynthetic, heterotrophic and autotrophic metabolism
3. Ecological diversity (2 hr)
 - A. Diversity in major ecosystems
 - B. Diversity in aquatic, marine and extreme environment

Unit IV. Biodiversity among Eukaryotic and Acellular Microorganisms

1. Eucarya: Morphological, cellular, physiological, metabolic and ecological characteristics of (8 hr)
 - A. Protozoans
 - B. Slime molds
 - C. Fungi
 - D. Algae
 - E. Lichens as consortium of algae and fungi
2. Acellular organisms: Viruses and prions (2 hr)

Text Books:

1. Cambell R., (1983), *Microbial Ecology*, 2nd edn. Blackwell Scientific Publications, London
2. Ogunseitan O., (2005) *Microbial Diversity: Form and Function in Prokaryotes*, Blackwell Publishing, Malden, MA, Oxford, Victoria
3. Atlas R M, Bartha R(1998), *Microbial Ecology: Fundamentals & Applications*. 4th edn. Pearson Education.

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