

Elective Course V (EC) – Microbial Biotechnology

Unit - I: Algal Biotechnology

Definition, Concepts - biotechnological potentials of microalgae – food – feed – Colourant - fuel and pharmaceutically variable compounds.

Unit II: Microbial biofertilizers

Production of microbial biofertilizers – Mass cultivation of cyanobacteria (Spirulina), Azolla and other N₂ fixers (*Azospirillum*, *Azotobacter* & *Rhizobium*)

Unit-III: Microbial Pesticides

Basic principle – antagonism, amensalism, siderophores, parasitism, nematophagy. Microbial herbicides, microbial insecticides - bacterial insecticide *Pseudomonas*, *Bacillus* sp. – *Bacillus thuringiensis* - toxins - BT cotton - viral insecticide - entomopathogenic fungi.

Unit- IV: Industrial Processes and Products

Production microbial products – malt beverages – alcohol - vinegar - lactic acid- citric acid- penicillin - streptomycin- L-lysine- L-glutamic acid – protease – lipase - pectinase and riboflavin.

Unit – V: Bioremediation

Microbes in abatement of heavy metal pollution - heavy metal tolerant microbes - Mechanism of heavy metal and antibiotic resistance - role of biosorption - biotransformation of Xenobiotics - Superbug - rDNA application. Biodegradation of oil and petroleum products. Microbial leaching - Copper - Uranium.

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