

B.Sc. PLANT BIOLOGY & PLANT BIOTECHNOLOGY

ALGAL BIOTECHNOLOGY

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

Special Theory

Paper 1b ALGAL BIOTECHNOLOGY

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UNIT I

Introduction to algal biotechnology: Resource potential of algae; commercial utility of algae. Algae as a source of food and feed; Algae as a source of pigments, fine chemicals, fuel and bio-fertilizers. Distribution of economically important algae in India.

UNIT II

Uses of the following algae: *Spirulina*, *Dunaliella*, *Haematococcus*, *Chlorella*, *Scenedesmus*, *Botryococcus*, *Porphyridium*, *Hypnea*, *Gracilaria*, *Gelidium*, *Gelidiella*, *Kappaphycus*, *Grateloupia*, *Sargassum*, *Turbinaria*, *Cystoseira*, *Laminaria*, *Macrocystis*, *Porphyra*, *Caulerpa* and *Ulva*.

UNIT III

Algal production systems; Strain selection; Algal growth curve; Culture media; indoor cultivation methods and scaling up. Measurement of algal growth. Large-scale cultivation of algae. Evaporation and uniform dispersal of nutrients; Harvesting algae. Drying.

UNIT IV

Chemical composition: protein, amino acids, lipids, waxes, glycerol, vitamins, pigments, chlorophyll, carotenoids and phycobiliproteins. Algal immobilization and its applications; Blue-green algal bio-fertilizer: Method of preparation, application and its advantages over inorganic fertilizers.

UNIT V

Liquid seaweed fertilizer: Method of preparation and application. Biodiesel from algae: algae producing biodiesel; Advantages over other sources of biodiesel; Cultivation and extraction methods. Phycoremediation. Role of algae in nanobiotechnology.

UNIT VI

Algal control: Methods of control of algae; Algicides-preparation and Application; ultrasonic sound producing devices to control algae. Algal culture collection centers in India and abroad and their importance; Centers pursuing algal research in India and their field of interest.

Suggested Reading

- BARSANTI, LAURA AND PAOLO GUALTIERI 2005 *Algae-Anatomy, Biochemistry and Biotechnology*. Taylor & Francis, London, New York.
- BECKER, E.W. 1994 *Microalgae-Biotechnology and microbiology*. Cambridge University Press.
- CHANDRAMOHAN, D. 2007. Prospects of Biodiesel from marine microorganisms. Proceedings of the National Workshop on BIODIESEL, Organised by School of Energy, Environment & Natural Resources, Madurai Kamaraj University, Madurai and Ahimsa Agri division, Chennai, 17th and 18th October, 2007.
- TRIVEDI, P.C. 2001 *Algal Biotechnology*. Pointer publishers, Jaipur, India.
- VENKATARAMAN, L.V. AND E.W. BECKER 1985. *Biotechnology and Utilization of Algae - The Indian Experience*. Dept. Science and Technology, New Delhi and Central Food Research Institute, Mysore, India.

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