

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Third Year)

Subject: Botany

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Paper Title: Microbiology & Plant Pathology

Unit: 3 (Preservation & Maintenance of Microbial Cultures)

Module Name: Culture Collection Centres

Module No: 14

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Notes:

Culture Collections - are centers that provide authentic organisms that can be grown or maintained in the laboratory. They are valuable resources for the sustainable use of microbial diversity and its conservation. It focuses on the acquisition, production, preservation, and distribution of viable cultures of standard reference microorganisms. They play public service role and can provide associated information which can be used by the future generations. Microorganisms are indispensable for the existence of plant and animal life and one cannot afford to destroy them. India is recognized as one of the hotspots of mega-biodiversity consisting of enormous endemic microbial diversity. Extensive bio-prospecting projects the immense microbial diversity which could potentially be exploited for medicinal, industrial and agricultural purposes.

It takes several years in characterization and development of microbial cultures. At these centers, the cultures are maintained scientifically by experts. These cultures are governed by stringent rules and regulations so that intellectual property right of the depositors is protected.

Role of Culture Collection Centres:

They act as a depository of patent cultures.

Maintain isolated pure cultures for extended periods in viable state.

Act as a means for ex-situ conservation of microbial resources.

Serve as a reference for identification and classification of new isolated organism.

Provide a uniform source of authentic cultures to industries as well as academic and research institutes.

Develop new culturing strategies for "not yet cultured" microbes.

Preservation and storage of newly isolated strains, genetically engineered strains, strains with plasmids and other useful microorganisms.

These centres focus on basic research in the areas of microbial diversity, microbial taxonomy, microbial genomics, proteomics etc.

Isolation and identification of microorganisms from various environmental niches.

Types of Culture Collection Centres:

3 types based on their specialties and functions.

Private Culture Collection - Usually maintained by individuals, laboratories, institutes, hospitals and commercial firms. For example, research institutes in some private companies hold more than 20,000 cultures. The strains in private culture collections are usually not open to the public.

Specialized Culture Collection - This type of culture collection arises in the course of a taxonomic study on a specific group of micro-organisms in specialized fields when a considerable number of strains have been isolated. Specialized fields include: Brewing, production of antibiotics, plant pathology etc. For example, Fungal Collection of Microorganisms of the University of the Philippines, Los Banos (FCUP, WDCM 103).

Public Culture Collection - Consists of a large number of strains, and is established for the purpose of public service. The number of taxa varies from collection to collection.

Major International Culture Collection Centres:

NCIB - National Collection of Industrial Bacteria, Britain.

MTCC - Microbial Type Culture Collection, Osaka Japan.

ATCC - American Type Culture Collection Centre, Maryland, USA

ICIM - Indian Culture of Industrial Microorganisms, National Chemical Laboratory, Pune.

MTCC - Microbial Type Culture Collection and Gene Bank, Chandigarh.

NCMR - Centre for Microbial Resource, Pune.

Importance of depositing microorganisms in culture collections centres:

To ensure repeatability of living microorganisms along with description and other factors.

Isolating microorganisms from specific ecological niche can be completed by depositing the microbial culture.

It ensures isolation of the same strain from an ecological niche, if cultures are deposited in culture collection bank.