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Microbial resource centres and need of seed-banking/bio-banking of microorganisms for sustainable use and protection of environment

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Culture independent omics studies have demonstrated the presence of vast majority of uncultured microbial diversity in different habitats and triggered the microbiologists to apply novel methods and approaches to bring them in culture for research and exploitation. Consequently, publications related to novel taxa are continuously increasing in microbiological literature in recent time. Cultivation and characterization of novel taxa must require their appropriate preservation in microbial resource centres (MRCs) for future reference, research and exploitation. Therefore, concept of bio-banking/seed-banking of microorganisms should be promoted by microbiologists, microbiological societies and funding agencies to protect the valuable microbial diversity of our planet. In addition, microbiological journals should also insist on deposition of microorganisms before their publication and to make them accessible to public and protect them from extinction. At present most MRCs are just focusing on *ex-situ* preservation. Concept of ecosystem and habitat preservation is in infancy in microbiology and now it is necessary to start thinking about preservation of microorganisms at ecosystem or habitats level to protect them from extinction. Furthermore, in addition to culture preservation and authentication MRCs should engage in research related to causes of genetic changes and induction of cell dormancy during preservation. Microbial Culture Collection (MCC) located at National Centre for Cell Science (NCCS) Pune, India maintains more than 1,50,000 strains of bacteria from diverse ecological niches of India. In this presentation, the author would like to focus on the issues mentioned above but also on strategies and approach that are being used here to preserve and exploit their own microbial resources.

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Non cryogenic alternatives for biobanking cells and germplasm

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Current cryopreservation techniques are robust, but storage is expensive, needs specialized storage facilities and continuous supply of liquid nitrogen. The author demonstrated for the first time that lyophilized somatic cells direct embryonic development upon injection into enucleated oocytes. These findings have been a stepping-stone for a further demonstration that lyophilized cord blood cells were capable of forming colonies upon rehydration. This talk will focus on preliminary data generated in my laboratory on the use of recombinants Late Embryogenesis Abundant (LEA) proteins - physiologically expressed in seeds during maturation - to confer desiccation tolerance in somatic cells.

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