

Training course of Microbial Resources Information Management and Utilization for Developing Countries

September 6-23; 2016

**Bureau of International co-operation Chinese
Academy of Sciences (CAS)**

Shaghayegh Nasr (Ph.D, Microbiology)

Microorganisms Bank, Iranian Biological Resource Center (IBRC), ACECR, Tehran, Iran. Tel: +98 (0)269218983, Fax: +98(0)2692108965, email: nasr@ibrc.ir; shaghayegh2963@yahoo.com

Website: www.ibrc.ir

Content

No.	Subject	Page Number
1	Personal Information	3
2	Abstract	4
3	Keywords	4
4	1. Brief introduction of the culture collection	5
5	2. Benefit from the training course	10
6	3. Suggestion on WDCM work	11
7	4. Comments or suggestion on the training course	11
8	5. Suggestion on further cooperation between WDCM and your collections	12

Personal Information

I am Shaghayegh Nasr. I did my bachelor degree in Marin Biology (Shahid Beheshti University; 2003) and my master and ph.D. in Microbiology from Alzahra University in 2007 and 2014, respectively. Currently, I am working as an executive manager and the curator of Mycology laboratory in Microorganisms bank of Iranian Biological Resource center (IBRC). My research projects focus mainly on biodiversity and enrichment, isolation, purification, polyphasic identification and taxonomy of yeasts from environmental samples. So far, I have introduced 3 novel taxon of yeasts and yeasts-like microorganisms and recently I am working on evaluation of indigenou *Saccharomyces cerevisiae* strains for industrial application mainly probiotics and application as baker yeasts.

Microorganisms Bank, Iranian Biological Resource Center (IBRC), ACECR, Tehran, Iran.

Abstract

The training course on microbial resources information management and utilization for developing country hosted by WFCC-MIRCEN world data center for microorganisms (WDC) and organized by Word Federation for Culture Collection (WFCC), United Nations Educational, Scientific and cultural organization (UNESCO), Institute of Microbiology, Chinese Academy of Science (IMCAS), CODATA Task Group on Advancing informatics for Microbiology (TG-AIM) and supported by Bureau of International Co-operation Chinese Academy of Science. Fifteen researchers from developing countries including Argentine, Brazil, Bulgaria, China, Fiji, Greece, India, Iran, Russia, Romania and Thailand participated in this training course to acquire knowledge on microbial culture collection around the world, data management system and data standards in this area and update our information regarding the main databases including WFCC and CCINFO, GCM on-line catalogue, taxonomic rules and regulation and required ISO certificate and Bioinformatics in general. The relatively long period of this training course provide participants with the opportunity of communication between scientific groups in different countries and recognition of their weakness and strength for promoting partnerships, joint projects and the networking between microbial resource centers.

Keywords

Data management system, developing countries, ISO, Iranian Biological Resource center, microbial culture collection, training course

1. Brief introduction of the culture collection

The collection was founded on 2008 under the authority of Academic Center for Education, Culture and Research (ACECR) and housed within the Biological Resource Center in Iran (I.R. of) and it is one of the largest public collection of microorganisms in the country and a member of WFCC (World Federation of Culture Collections [WDCM950]). Collection has currently containing strains of archaea, bacteria, filamentous fungi, yeasts and algae that can be handled in Biosafety level 1 or 2 facilities (Risk Group 1 or 2). The collection performs scientific research including taxonomic studies and screening of industrially and environmentally significant organisms. Microorganisms bank is continuously trying to improve the functions as a microbial resource center, to exploit new microbial resources, to describe novel microbial taxa and to develop the methods for investigating and handling microorganisms and microbial communities. Microorganisms bank has been acquired the certification of ISO 9001:2008 for its quality management system to maintain and improve the quality of its services.

Iranian Biological Resource Center (IBRC) acts as the pioneering center at national and international levels in areas of collection, identification, quality control, classification, recording, preservation, reproduction and distribution of various biological material including archea, bacteria, fungi, seeds and plant as well as animal cells, genomic DNA and vectors in order to prevent wastage and destruction of Iran's national wealth. This Center endeavors with the belief in ongoing improvement of its activities, processes and services and with the goal of increasing customer satisfaction (including research, industrial, and medical

centers); in this regard, it has selected and implemented the requirements of ISO 9001:2008 as the quality management system.

Main visions of the center have always been founded on the following principles:

1. Increasing the volume of activities, and improving offered services (sample production and technical services) in order to develop the Center's commercial activities.
2. Optimal use of modern technology, technical knowledge as well as development of necessary infrastructure in order to raise the quality of services and develop cellular, microbial, molecular and plant reserves.
3. Establishing and developing scientific and specialized communication and interaction with related national and internationally reputed centers and banks as well as raising the scientific and research status of the Center at national, regional and international levels. Iranian biological resource center have signed memorandum of cooperation with the following research centers and universities:

- University of Valencia - Spain
- University of Prugia - Italy
- University of Tsukuba - Japan
- University of Erasmus – Netherlands

4. Developing awareness, accountability, commitment and capabilities of the Center's employees through:

i. Recruiting employees based on meritocracy

ii. Systematic training of the employees for continuously strengthening their technical and specialized knowledge and skills

iii. Encouraging employees' participation for raising awareness regarding the quality management system

5. Standardizing, proposing required suggestions and regulations and bylaws to the competent legal authorities for enactment in order to preserve Iran's biological and genetic resources

6. Prioritizing preventive rather than corrective measures

Since maintenance and improvement of the quality management system requires serious participation of all the Center's employees, the head of the Center, in addition to pledging to ongoing improvement of the system, intends to move in the path of survival, growth and profitability of the Center through improving quality of the services. He also intends to revise its effectiveness at certain intervals in addition to supervising and maintaining the implementation of quality policy.

The Microorganisms Bank

The Microorganisms of Iranian Biological Resource center is the most diverse culture collection in the country. Its collections currently comprise more than 3511 items, including about 2406 different bacterial and archaea strains, 753 fungal strains, 84 algae, 90 cyanobacteria and 67 diatoms and standard type strain and deposited strains. All biological materials accepted in the Microorganisms Bank collection are subject to extensive quality control and physiological and molecular characterization. In addition, Microorganisms Bank provides an extensive documentation and detailed diagnostic information on the biological material.

IBRC has a center for biotechnology services which has been called the specialty, bringing biomaterials and biological services providing researchers the tools they need to undertake world-class research. The aim of the specialty services is to provide internationally competitive core facilities open to all researchers within the colleges, industries and medical centers. In fulfillment of this objective, the microorganisms Bank intend to facilitate services especially for identifying microorganisms using full physiological profiling, standard chemotaxonomic analysis or DNA sequencing for rapid species identification.

Research projects developed by IBRC staff or in collaboration with research groups of the host laboratory are largely focused on a polyphasic approach (using complementary molecular characterization) aiming at the phylogenetic study, identification and typing, and functional characterization of various microorganism groups, in the frame of:

- Analysis of culturable and unculturable microbial diversity especially from saline environment
- Screening and evaluation of probiotic microorganisms from fermented food and dairy product
- Screening and using modern molecular techniques for obtaining industrial microorganisms
- Screening and production of microbial enzyme including phytase, cellulose, amylase and protease, etc.
- Study of marine and lake microbiome of Iran

The IBRC offer career oriented workshops in microbiology and related areas. The organization tries to keep the balance of practical and theoretical guidance. Time table of these programs designed to provide the trainees with ample time for hand on experiences on instruments and equipments available at our center. Lectures and practice were delivered by the staff of our laboratories in the area of isolation, preservation and classification and taxonomy of Archea, bacteria, filamentous fungi , yeasts and algae. Moreover participants also learned different technique and approaches through hands on sessions such as DNA sequencing data processing and interpretation, demonstration and practice on liquid drying and cryopreservation technique as well as information management. These courses and training program of the Microorganisms bank are to be held on the request of the candidates and for all your customer service enquiries call.

2. Benefit from the training course

Participation in the training course provides me the opportunity to meet international experts from all across the field and it will expand my professional horizon and strengthen my bond with the worldwide staff member of biological resource center community of individuals and research groups. I will be more than happy to share the skills and the information I gained and my experience with my fellow colleagues back home. Also, during the training course, I have the opportunity to meet others working on the similar line of work and facing similar challenges regarding data management system for large biological collection.

During the training course sufficient information regarding the Fellowship Programs of the Chinese Academy of Sciences and requirement and condition was provided. This could provide the opportunity for young researcher and Iranian students to conduct cooperative research at one of the institutes of the Chinese Academy of Sciences (CAS) and the visit from GCMCC provided the opportunity for participants to see the capabilities and facilities of GCMCC for future collaborations.

During the training course different regional and national network of culture collection were introduce that the membership in these organization could increase the visibility of our culture collection.

The information about the construction of TRUST (Literally or practically) and Nagoya Protocol (NP) as well as participation in different ISO working group and

its implication for Culture Collections was very useful to designing the future policy and procedures of our culture collection according these concepts.

3. Suggestion on WDCM work

WDCM should continue the effort of up grading data management system in culture collection around the world. It also should search for the strategies to support the small culture collection through financial sponsorship, collaboration and joint project and outsourcing services.

4. Comments or suggestion on the training course

I would like to express my gratitude to WDCM and Bureau of international cooperation Chinese Academy of Science and also Dr. Juncai Ma, Dr. Lihuan Wu and Miss Jianyuan Zhang for providing the opportunity of my participation in the Training Course of Microbial Resources Information Management and Utilization for Developing Countries, and also for sponsorship of the accommodation during the training course in Beijing.

The training course was generously sponsored by CAS. However, it seems that better organization of topic and avoiding the overlapping theme and titles could provide the opportunity to reduce the duration of course and increase the quality and the volume of information.

Most of the content of training course was theoretical information. Practical workshops regarding advance method of Isolation, Identification and preservation of microorganisms is strongly suggested.

In my opinion, Bioinformatics, metagenomics and whole genome sequence analysis are considered to be very popular topic in modern microbiology. Hand on training to analyse data related to the recent molecular technologies would be very useful for participants. Lectures followed by practice on the topic/methodology will be more beneficial for understanding the process involved.

5. Suggestion on further cooperation between WDCM and the collections

Continuous cooperation, constant up- date of information, in WDCM could play a significant role in increasing the visibility of biological resources around the world and facilitate the better usage of biological resource holding in both academic and industrial level.