

Summary Report, WDCM Training Course on Microbial Resources Information Management and Utilization for Developing Countries

Personal introduction

I'm Dr. Farzaneh Azizmohseni. I got my Doctorate degree in Medical Laboratory (MDLS) in 1995. I began to work as a researcher in Iranian Research Organization for Science and Technology (IROST) in the same year and was appointed to the director of Persian Type Culture Collection (PTCCI) in 1998. I'm also involving in research projects on isolation of microorganisms from different ecosystems of IRAN such as oil contaminated soil, pistachio orchards, marine sedimentation. I have published more than 20 papers in different scientific journals mostly about isolation of microorganisms with special application. My oral and poster presentations in national and international conferences have been more than 40. Recently I have collaborated in a research project on the isolation of LAB (Lactic acid bacteria) from Iranian traditional dairy products; screening potential probiotic strains.

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Persian Type Culture Collection (PTCCI)

ABSTRACT

In this report the Persian Type Culture Collection (PTCCI), its history, functions and activities is described. The topics that were presented and discussed in two weeks WDCM training course on microbial resources information management is reviewed. The advantages of participation in training course on microbial resources information management are described. How WDCM and Institute of Microbiology, Chinese Academy of Science (CSA), can support small Culture Collections in developing countries. There are some suggestion and comments on the quality and quantity of WDCM training courses. The potential for collaboration and partnership between WDCM, Institute of Microbiology and PTCCI are also considered.

Key words: WDCM, Culture Collection, Microbial Resources, PTCCI, Information Management

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1. Introduction

The WDCM training course on Microbial Resources Information management was begun by opening remarks of Dr. Philippe Desmeth, the president of WFCC. This training course covered different topics including construction of TRUST (Literally and practically), Nagoya Protocol (NP), European Union Law on compliance regime (2014) and its implication for Culture Collection. The participants were informed about marine biological resources and issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. Information about how the KRIBB (Korean Research Institute of Bioscience and Biotechnology) manage their biological resource and how implement NP in Korea was presented. Other important topics were polyphasic taxonomy, a consensus approach to bacterial systematics as well as phenotypic taxonomy of fungi. The role of

bioinformatics in clinical bacteriology and the use of multilocus sequence typing (MLST) scheme specially for typing bacterial pathogens and epidemiological studies also discussed. Development of microbial genome annotation, pipeline (MiGAP) to interpret sequences and Microbe database (microbedb.JP) were introduced. Reviving of global MIRCEN network and the role of UNESCO and MIRCEN in supporting the BRCs in developing countries was another important topic. Biosecurity, biosafety and risk assessment of biological resources in BRCs were presented. There was presentation and discussion on WFCC homepage and global catalogue of microorganisms, WDCM databases, homepage, CCINFO and WDCM reference strains, microbial resources data standards, WDCM minimum data sets and recommended data sets. The participants presented activities, functions and the facilities of 20 culture collections in one session.

The old and next generation of DNA sequencing and its application and workflow of microbial genome were introduced. There was a presentation about DNA Barcode of life and Bold Mirror, the features and perspectives. Researches on Influenza Virus and its genetic changes in China have been reviewed.

2. Persian Type Culture Collection (PTCCI) at a glance

Persian Type Culture Collection (PTCCI) is a nonprofit biological resource center whose mission is to provide and preserve the authenticated microorganisms for research and education in the area of microbiology, biotechnology and life science. PTCCI was established in 1982 as a part of biotechnology Department in Iranian Research Organization for Science and Technology (IROST). It has been a member of World Federation for Culture Collections ([WFCC](#)) since 1985 with WDCM number of 124. The auspicious year for PTCC was 1992, when it was recognized as Tehran-MIRCEN, a member of UNESCO Microbial Resources Network. Since its establishment PTCC has offered a broad range of services to support the scientific community and industries. This center houses more than 5000 microorganisms including bacteria, archaea, fungi and yeasts. All biological materials accepted in public collection of PTCCI are carefully checked for authenticity and purity by state of the art methods. PTCCI is a long-term partner of a variety of research institutes and industrial companies and has been certified to meet the internationally valid quality standard of ISO 9001:2008. The research projects of PTCCI focused on the microbial diversity and improving methods for the ex situ preservation of biodiversity.

PTCCI offer below services:

- 1- Deposit of microorganisms for public access and distribution of

microbial strains

2- Offering safe deposit for the long-term preservation of microorganisms where the distribution of the strains is restricted at the discretion of the depositor

3- Identification and characterization of microbial strains

4- Contract services to support research projects in the field of applied microbiology

5- Providing training courses, workshops on different aspects of microbiology including microbial diversity and preserving and storing microorganisms

Web site: <http://ptcc.irost.org>

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2. Benefits of participation in the training courses

The advantages of this training course have been mentioned below:

1- PTCCI consider itself as a bridge between providers and user of microbial resources so it will design a unique policy for MAA (Material Accession Agreement) and MTA (Material Transfer agreement) to meet legal requirements for building TRUST according to Nagoya protocol.

2- PTCCI as a member of Global catalogue of microorganisms (GCM) now can access, track and monitor the data of GCM and how can get

benefit from sharing the information.

3- PTCCI will revise and manage its own database according to the minimal datasheet (recommended in Best practice guideline OECD 2007).

4- PTCCI uploaded its catalogue on GCM and will edit its contents regarding the knowledge resulted from participation in training course on data management.

5- PTCC got familiar with 20 other culture collections via their representatives and discussed about the potential collaboration on different subjects.

6- PTCC provided global partnership via joining Global catalogue of Microorganisms.

7- PTCC will implement CBD/NP in microbial resource information management.

8- As a participant, my knowledge about different databases that can be used to get information about different biological resources have been increased.

9- Participants learned how can use ABC Analyzer of Bioresouce Citation and how the data are managed and text mined.

10- As a researcher that involved in research projects on biodiversity of marine microorganisms, it was interesting to know about challenges posed by emerging international legal frameworks. I also informed about

marine biological resources and issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction.

11- The information about the construction of TRUST (Literally or practically) and Nagoya Protocol (NP) as well as the European Union Law on compliance regime (2014) and its implication for Culture Collections was very useful to modify the PTCCI policy according these concepts.

12- The presentation about how the KRIBB (Korean Research Institute of Bioscience and Biotechnology) manage their biological resource and NP implementation in Korea was very informative.

13- The visit from GCMCC provided the opportunity for participants to see the capabilities and facilities of GCMCC for future collaborations.

14- A brief review on poly phasic approach for classification of bacteria refreshed our knowledge about this issue. The presented information in classical phenotypic taxonomy session for fungi was not very update, though the photos were interesting.

15- The participants' knowledge about the role of informatics in clinical bacteriology was updated. Regarding the introduced websites and the equipment existed in PTCCI, it is possible to use of multilocus sequence typing (MLST) scheme for typing bacterial pathogens and epidemiological studies.

16- Participation in this training course provided an opportunity that the UNESCO programme specialist for natural sciences explained the revitalization of MIRCEN. The representatives of culture collections also described their expectation for support.

4. Suggestion on WDCM work.

A- As the director of PTCCI I suggest that WDCM establish a forum, in order the members of GCM can discuss freely about different items that related to data management and data bases. Nowadays forums have a great role in promoting interactive scientific discussions. It is very helpful to have an opportunity to discuss about the problems we encounter on line.

B- I also suggest that WDCM holds workshops on software packages that usually used for genetic studies.

C- PTCCI Suggests that WDCM provides tools for Small CCs for data gathering and analyzing on the basis of QMS (Quality Management System).

D- PTCCI suggests that WDCM does not restricted its activities to holding training course, but visit data management of GCM's members in order to help them to improve it.

E- PTCCI suggests that the in home page of each CCs a link will be created to its own catalogue in GCM. This direct connection provides the

interactive connection between culture collection home page and its catalogue in GCM.

F- PTCCI expects WDCM helps the participants to establish regional networks.

G- As a user of WDCM website, I expect that the information and reports of the site upgrades at short intervals.

H- As the director of PTCCI, I know the importance of implementation of QMS (Quality management system) in BRCs. I suggest that WDCM works on quality management software system that directly addresses all the requirements of the ISO 9001 standard.

5. Comments or suggestion on the training courses.

1- WDCM experts in database management help developing countries to hold regional workshops and training courses to increase the knowledge of microbial data management.

2-WDCM holds workshops as well as training courses on how to use different database that are applied in bacterial taxonomy.

3- For the international courses I suggest that WDCM invites lecturers with updated knowledge. For example the information that presented in “classical taxonomic study of fungi” was old and far from the modern taxonomy.

4- In the CCs presentation session all the participants introduced their CC and activities. It was very fruitful session because the presentations showed the capabilities and the potential for future collaboration. It was supposed that the WDCM team also take part in this session, because their presence and comments could increase the efficiency of the session. All the participants wished to know the prior topics of institute of microbiology, CAS for the collaboration.

6. Suggestion on further cooperation between WDCM and your collections.

- 1- After establishment of QMS (Quality Management System) in 2011, The PTCCI records all the information about the services it offers to the researchers and R&D sections. So, PTCCI can track all the strains which have been distributed in different parts of Iran from 2011. I would like to use such a great data in order for research and publishing. It can be presented as a sample of tracking system. Maybe PTCCI and WDCM could collaborate on this subject.
- 2- PTCCI involved in research projects on isolation of microorganisms from different ecosystems in Iran. Usually these are proposed on the basis a special application such as production of enzyme or active biological molecules (such as anticancer or antioxidants,...). After isolation and purification of strains, other researchers study on their

special characters, and PTCCI works on preservation and taxonomy. So, we have a large quantity of bacteria that have isolated from different ecosystems (e.g. oil contaminated soils, Dairy products, marine sediments). They have not been characterized yet. Maybe Institute of Microbiology can help us to characterize and classify these microbial resources.

3- We also have a special section that works on Actinomycetes and their active secondary metabolites. The Actinomycetes are isolated from different ecosystems and their potential active secondary metabolites are assessed. The structures of these bioactive products are compared with the previously discovered bioactive molecules to recognize its novelty. This issue could be another field for collaboration.

4- I have been involved in an epidemiologic study with Iranian Red Crescent. The aim of this study is that how much the Meningococcal vaccines can protect the hadjis (Muslim people that who have made the piligrmage to Mecca). We should determine the titer of functional antibodies against *Neisseria meningitides* before leaving Iran and after returning. For this reason we need standard A, C, Y, W135, serotypes of *N. meningitidis* to set up the test called bactericidal serum assay (BSA). If CGMCC have these strains, we can collaborate in this project. This will have many benefits for both sides. Because (BSA) is very professional and valuable test, that CGMCC can offer service

even internationally.

- 5- PTCCI and CGMCC can collaborate in the area of preservation. I'm sure that you have some species that cannot be preserved by freeze drying processes. PTCCI has very good experience on different formulation of suspending media that used as lyoprotectant. For example *Campylobacter* strains are usually are sensitive to lyophilization, but by applying suitable suspending medium the cells will tolerate the lyophilization stresses and would be dried with minimum reduction in reviving count. In addition our lyophilization system is the same as DSMZ and ATCC. That means PTCCI freeze dries the deposited microbial strains in 2 vials. The inner vial contains the biomaterial and the outer one protects the dried material from oxygen and moisture. In addition the blue silica gel is added in the outer tube as indicator to detect any damage to freeze dried ampoules.
- 6- I'm also thinking on implementation of barcode system for data management in PTCCI. I would be glad if we can collaborate with WDCM on this subject.
- 7- PTCCI has very high capacity and laboratory facilities to collaborate in different area of applied microbiology and welcomes any special proposal from WDCM Institute of Microbiology, CAS.

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