

SUMMARY REPORT

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

I am, Musliyana Mansor, working as a Science Officer in Institute of Bioscience (IBS), Universiti Putra Malaysia (UPM). I obtained my Degree of Science (Honours) majoring in Microbiology and Biochemistry from Universiti Putra Malaysia and currently pursuing my Master of Science. I joined UPM in 2000 as a Research Assistant and appointed as a Science Officer at IBS, UPM in 2001. In my early career, I was involved in establishment of automated DNA sequencing service and the laboratory of Genome Centre, IBS. In 2008, I involved in the establishment of Microbial Culture Collection Unit (UNiCC) and have been sent for 3 weeks training for management of culture collection in BIOTEC Culture Collection Thailand. Currently I am a curator for UNiCC and doing research in characterization, identification and preservation of beneficial microbial for agriculture sector.

*Microbial Culture Collection Unit (UNiCC), Institute of Bioscience,
Universiti Putra Malaysia*

ABSTRACT

Microbial Culture Collection Unit (UNiCC), Institute Bioscience, Universiti Putra Malaysia was established to be the main culture collection for research and teaching, focusing on microbes isolated from food, agriculture and the environment for Malaysian researchers. Besides keeping the quality strains and doing research, maintaining the database information about the strains and genomic data are also important. By attending Training Course of Microbial Resources Information Management and Utilization for Developing Countries organized by WDCM, we hope that we could gain more knowledge on managing bioinformatics data and related research for our culture collection and also for the university.

Key words: Microbial Culture Collection Unit (UNiCC), WDCM, bioinformatics

1) Microbial Culture Collection Unit (UNiCC), Institute Bioscience, Universiti Putra Malaysia

UNiCC was established to be the main culture collection for UPM research and teaching, focusing on microbes isolated from food, agriculture and the environment. The unit opened its doors to the researchers not only from UPM, but also from other universities, industries and research institution in Malaysia. UNiCC providing services and expertise in isolation, identification, preservation and quality checks of microorganisms. UNiCC has expanded their services offering other service such as antimicrobial assay and NGS bioinformatics facility. It also serves to safe-keep recombinant microbes that had been developed by the University researchers.

In 2011 UNiCC registered with the World Data Centre for Microorganisms (WDCM) with registration number 988 and using the acronym UPMC as part of the accession number. In 2013, WDCM invited UNiCC as the first culture collection entity in Malaysia to participate in the World Federation of Culture Collection's Global Catalogue of Microorganisms (GCM). This collaboration were further commemorated by the signing of an MoU between UPM and WDCM on the day. With this collaboration, UNiCC will be more visible as a culture collection center within the

scientific community in Malaysia and also globally. Both parties will hopefully benefit from the MoU and use it as a platform towards building a National Network of Culture Collection in Malaysia. UNiCC can also hopefully take the lead to do this, making the effort of conserving Malaysian microbial biodiversity one of the main research agenda for the country.

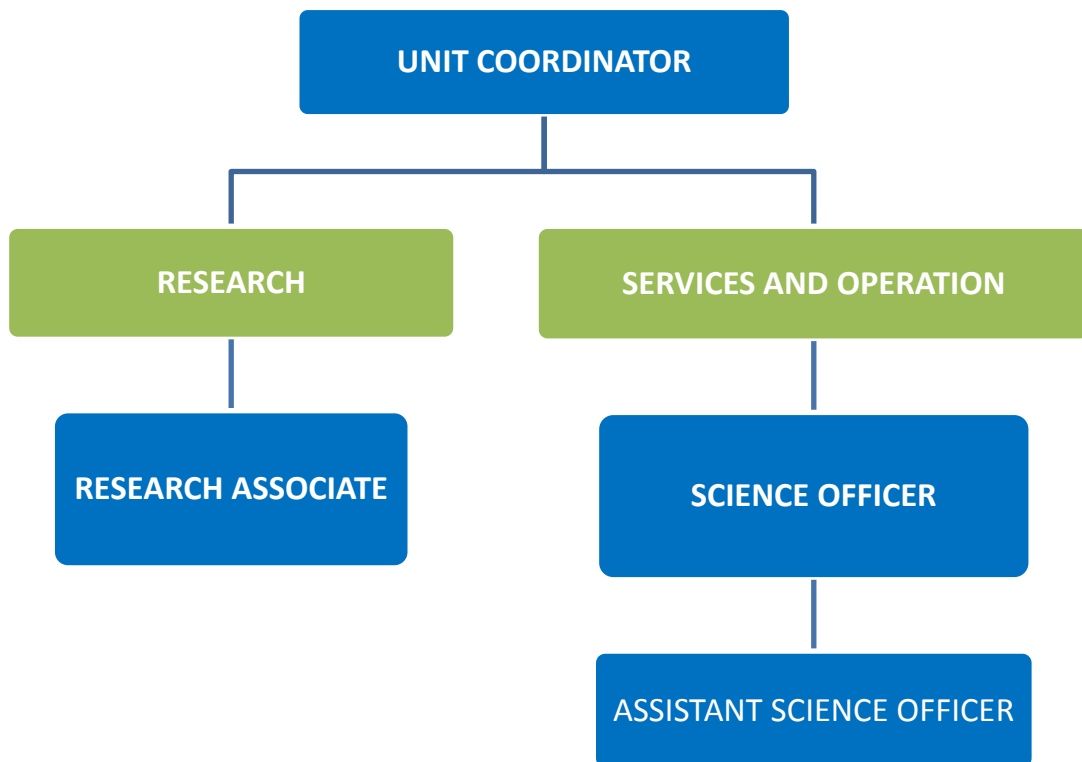
Today, UNiCC has grown into an active Unit organizing seminar/workshops to increase the awareness of the importance of culture collection and conservation of biodiversity for microorganisms in Malaysia.

Objectives

Objectives of UNiCC's establishment are:

- a) To establish and maintain a microbial culture collection centre using a standard system.
- b) To provide safe deposition of microbial cultures for Malaysian researchers and industries.
- c) To stimulate and support the study and research work related to microbial diversity and taxonomy in UPM and Malaysia.

Organization Structure of UNiCC



Since its initiation, the laboratory has been equipped with freeze-dryer, -80°C freezer, refrigerated centrifuge, biosafety cabinet level 2, laminar air flow, phase-contrast microscope, autoclaves and incubators. For long term preservations, UNiCC applies freeze-drying technique. For short term preservations, freezing technique (-80 degree) and preserving in paraffin oil (for fungi) are used. To date, a total of 1051 microbial strains consisting of 917 bacterial strains, 130 fungal strains and 4 yeast strains have been deposited. We have also approximately 300 strains of bacterial isolates ready to be identified.

Services Offer

UNiCC offer services as below:

- i) Public depository
- ii) Safe depository
- iii) Lyophilization of microorganism
- iv) Microorganism supply
- v) Identification of bacteria (molecular method)
- vi) Antimicrobial assay screening
- vii) Minimum inhibitory concentration test (MIC) and minimum bactericidal concentration Test (MBC)
- viii) Next Generation Sequencing
- ix) Training and consultancy

Certification

UNiCC is certified for ISO 9001:2008 for the scope of Management and Implementation of Research.

Documentation

UNiCC operates according to the documents that we have developed:

- i) Procedure of Management of Culture Collection
- ii) Procedure of Supply of Microorganisms

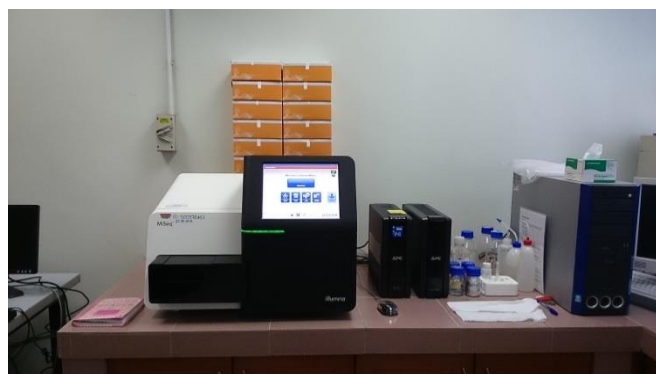
Laboratories

- UNiCC have 2 laboratories to operate for accession, supply, preservation, quality checking and other services :
 - Microbiology lab (Bacteria)
 - Microbiology lab (Fungi)
- We also have room for media and reagent preparation :
 - Media preparation room



Equipment in UNiCC

- Freeze Dryer
- Freezer -80°C
- Chiller
- PCR Machines
- NGS Instrument



Preservation Techniques

- Freezing in -80°C



Preservation Techniques

- Freeze Drying (suitable for bacteria, yeast and sporulating fungi)



Storage of Freeze Dried Samples

- We support the 'go-green' campaign by reusing pieces of cut boxes for packaging.



2) Benefit from the training courses.

There are a lot of benefits we gained from this training course.

The benefits are listed as follows:

- It was a good opportunity and exposure for young curator, researcher and technical staff to have a training abroad and meet other participants from other country.
- This kind of course are important, in order to comply the demands of culture collection in the development of competent staff on effective curation and management of a culture collection.
- Building up new networking among the participants of the training. We have a lot of chances on changing of knowledge within the culture collection and also build up future research collaboration.
- We have learnt more about legal policy, benefit sharing and Nagoya protocol. E.U Compliance Law is a very good example on how the enforcement of the law in one country and comply with the needs of Nagoya Protocol.
- Good opportunity of meeting Microbial Resource Centre – UNESCO (MIRCEN) representatives and to know their roles in providing a global infrastructure incorporating national, regional and international cooperating laboratories geared to the management, distribution, and utilization of the microbial gene pool.

- Good sharing on how the management, set-ups and facilities information of biological resources during the session below:
 - Management of biological resource in Korea.
 - Visiting session to China General Microbiological Culture Collection Center (CGMCC).
 - Presentation from participants.
- Good sharing in taxonomy studies during the session of characterization of bacterial and fungi strains.
- Bioinformatics information (annotation pipeline projects, BIOL), microbial genome/sequence analysis (MEGA, Chromas) and research finding sharing are very good and useful for my research and also other researches for my University.
- It was good to know the functions/details and how to use the applications on the WDCM webpage:
 - WFCC Global Catalogue of Microorganism (GCM) – We hope by joining this project, the UPMC accession number will be visible to the scientific community globally.
 - WDCM Analyzer of Bio-Resources Citations – The analyzer is useful to keep track the usage of the strains by publications.
 - Reference Strain Catalogue

3) Suggestion on WDCM work.

- Please put the link of culture collection webpage on the participant main page of GCM. This is needed so that people can easily get the information about our culture collection from that page and our institution more visible.

The screenshot shows a web browser window with the URL gcm.wfcc.info/cclist. The page displays a list of culture collections. A pop-up window is open over the entry for UPMC (Microbial Culture Collection Unit). The pop-up contains the following information:

Acronym:	UPMC								
Full Name:	MICROBIAL CULTURE COLLECTION UNIT (UNICC), UPM								
WDCM Number:	988								
Country:	Malaysia								
Contact person:	DR. TAN GEOK HUN								
Email of Contact:	tangeokhun@gmail.com								
Director:	PROF. DR. ABDUL RAHMAN OMAR								
Number of Species:	<table border="1"><thead><tr><th>Bacteria</th><th>Fungi</th><th>Yeast</th><th>Total</th></tr></thead><tbody><tr><td>580</td><td>52</td><td>2</td><td>634</td></tr></tbody></table>	Bacteria	Fungi	Yeast	Total	580	52	2	634
Bacteria	Fungi	Yeast	Total						
580	52	2	634						
Number of Strains:	<table border="1"><thead><tr><th>Bacteria</th><th>Fungi</th><th>Yeast</th><th>Total</th></tr></thead><tbody><tr><td>791</td><td>64</td><td>2</td><td>857</td></tr></tbody></table>	Bacteria	Fungi	Yeast	Total	791	64	2	857
Bacteria	Fungi	Yeast	Total						
791	64	2	857						
Information Updated:	2012-11-16								
Entry Time:	2012-11-16								
Update History:	<table border="1"><thead><tr><th>Bacteria</th><th>Fungi</th><th>Yeast</th><th>Total</th></tr></thead><tbody><tr><td>791</td><td>64</td><td>2</td><td>857</td></tr></tbody></table>	Bacteria	Fungi	Yeast	Total	791	64	2	857
Bacteria	Fungi	Yeast	Total						
791	64	2	857						
Home Page:	http://gcm.wfcc.info/988 http://gcm.wfcc.info/UPMC								

An arrow points from a box labeled "Link of webpage" to the "Home Page" field in the pop-up window.

- Please make the webpage of culture collection more attractive.

- Please make the visible/invisible function for the list of strain, works.

Strain Number	Name	History	Actions	
<input checked="" type="checkbox"/>	UPMC 1	Aspergillus niger	ATCC 200345 (Aspergillus niger)	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 2	Penicillium digitatum	ATCC 201167	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 3	Fusarium oxysporum	ATCC 11137	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 4	Ceriporiopsis subvermispora	-	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 5	Lactobacillus plantarum		✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 6	Lactobacillus plantarum	20.0	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 7	Lactobacillus plantarum	20.0	✓ - ✕ ✎ ✖
<input type="checkbox"/>	UPMC 8	Lactobacillus plantarum	20.0	✓ - ✕ ✎ ✖

4) Comments or suggestion on the training courses.

- I would like to thank WDCM for sponsoring the expenses of this course for me. I am very grateful for all the opportunity and experiences.
- Some of the suggestions are as below:
 - Provide the hands-out 1-2 days earlier before the lecture.
 - Please provide small room for Muslim participant to perform prayers in the academy.

5) Suggestion on further cooperation between WDCM and UNiCC

- We are inviting WDCM and WFCC to be co-organiser for our first National Culture Collection Conference next year. We would be happy to help WDCM organizing this kind of course in Malaysia before/after the conference.