

Thailand Institute of Scientific and Technological Research (TISTR) Culture Collection

Personal introduction

My name is Pornpoj Srisukhayakul who works as a researcher officer at TISTR culture collection under the ministry of science and technology, Thailand. For my education, I finished my first degree in biology from Mahidol University in 1998. Then, I did my master degree in microbiology at the Mahidol University. After I graduated in 2002, I had worked as a research assistant at faculty of pharmacy for 2 years with my supervisor. I got a new job in 2004 at TISTR. I worked at TISTR nearly for 7 years before I got the scholarship from Thai government to study in United Kingdom. I did my PhD degree in food and nutritional sciences at Reading University for 4 years and a half. Then, I returned to Thailand in 2015 in order to start my research work. My expertise is about bio-control by entomopathogenic fungi, taxonomy of bacteria, recombinant DNA, and probiotics.

ABSTRACT

Introduction of TISTR culture collection

Microbial culture collections are recognized as important resources which have been providing the scientific community with living organisms for education, research, and industrial application for over 50 years. At present, several culture collections have been established worldwide. In Thailand, there are main four culture collections including the Thailand Bioresource Culture Collection (TBRC), Department of Medical Science (DMST) Culture Collection, Department of Agriculture (DOA) Culture Collection and Thailand Institute of Scientific and Technological Research (TISTR) Culture Collection. In 2001, these four collections came together to form the Thailand Network on Culture Collections (TNCC). The major aim of this collaborative network is to set up a common and standardized system in microbial resources management in Thailand. TISTR culture collection is one of the main culture collections in Thailand which holds more than 6,000 strains of microorganisms, including bacteria, yeast, fungi and microalgae, for agricultural and industrial proposes. It provides specific services to the scientific community including deposit (general and patent accepted strains) and provision of cultures, identification of strains, on-the job training on preservation techniques and management of culture collection and safe deposit of patent accepted strains.

Key words: Culture collection, Microorganisms, Bangkok MIRCEN, TNCC

Brief introduction of your culture collection

TISTR culture collection or Bangkok MIRCEN, Bioscience department, Thailand institute of science and technological research (TISTR) is one of the main service culture collections in Thailand. It was established in 1976 with the support from UNESCO/UNEP in order to be a holding center for agriculturally and industrially useful microbial strains. Since 2000, the quality management system of TISTR culture collection services were audited and issued complaint with quality standards ISO 9001:2008 on supply, preservation and distribution of microorganisms. The main missions at TISTR culture collection are as followed

- To be an excellent center for microbial culture collection, classification and ex-situ preservation of bacteria, yeast, fungi and microalgae in order to support agriculture and industrial research and provide services to various agencies in both public and private sectors.
- To conduct and develop research by using biological resources, especially microorganisms in the area of agriculture, food, health products, livestock industry, energy, and environment.
- To transfer technology and innovation created from our knowledge and intellectual properties to target customers in both rural community level and commercial level.

- To provide research, contract research, services in the aspect of bioscience and microbiology conforming to the international standards and customer needs.

In order to achieve these missions, TISTR culture collection provides supply of microbial cultures to many groups of customer, such as school, university, governmental agencies, and private company. Recently, TISTR culture collection collected more than 6,000 strains. TISTR strains especially bacteria, yeast, fungi and microalgae covered a wide range of known and potential applications for biotechnology, bio-control, agriculture, environment and industry. The culture distributed 1,000 strains per year. TISTR culture collection not only provides microorganisms but also offers long term preservation, safe deposit and patent deposit for microorganisms with high quality control. TISTR culture collection also provides services on identification and characterization of microorganisms by using biochemical analysis and molecular based approaches, analysis of cyanobacterial toxins, and training services (e.g. microbial preservation methods, identification of microorganisms and screening for bioactive compounds).

In addition, TISTR culture collection has established many researches on application of culture collection microorganisms to comply Thai government national policy, Therefore, many research areas have been conducted, such as i) energy production and reduction of global warming by algae, ii) probiotic and

prebiotics, iii) biodegradability testing, iv) food and health product from mushroom, algae, and other microorganisms, v) vaccines and infection prevention products for livestock industry, vi) utilizations of microorganisms for treatment of hazardous compounds in environment, vii) production of biological compounds from microorganisms, viii) production of high value-added products from agricultural and industrial waste, ix) subtropical mushroom cultivation technology.

Benefit from the training course

Training course of microbial resources information management and utilization for developing countries is an excellent program for culture collection curators in order to acquire knowledge on activities and services of culture collection, learn about the development trends and new emerging technologies in the field of microbiological genome sequence information (e.g. whole genome sequencing, bioinformatics, and search engine tools), understand about the laws and regulations for microbial resources (e.g. OECD good practice guidance, CBD treaty, and Nagoya protocol, etc.) and manipulate microbial database and their management platforms.

As a curator, several topics during the training were very informative and interesting. The speakers provided us the useful information about their work which can help us to establish the new projects or improve our work. For example: The lecture by Dr. Philippe Desmeth “WFCC: A matter of TRUST” gave us the idea how to deal with Nagoya protocol in the future: The lecture by Dr. Yubo “Microbial synthesis of high-value plant secondary products: bioresource mining and engineering” suggested us how to use and modify bacteria in particularly *Escherichia coli* as a cell factory in order to produce high value secondary metabolites from plants: The lecture by Dr. Liming yan “Channel collected laboratory microbial information to biotech industrialization” provided us about technology transfer in china. The lecture by Dr. Li Xian “ISO/TC 276” showed us how to prepare ourselves for the new international

standard for culture collection in the future. Moreover, we have a chance to visit CGMCC and learn about the deposition and distribution system which is very useful for improving our culture collection and services in Thailand.

Importantly, we also learned how to access and use WDCM website for uploading the list microorganism strain from our culture collection which can help us to share this information to the public. Moreover, ABC website can help us to track and retrieve the information about how microorganisms from our culture collection have been used such as for either patent or publication. Finally, this training gave us the good opportunity to know the curators from many countries which help us to establish the connection and cooperation among us.

Suggestion on WDCM work

The 50th anniversary of WDCM is a good event that allowed the members to meet up with each other; however, this might not be enough to develop connection and cooperation among the members. The WDCM should have more activities or channels for contacting their members. This can be done through online conference which is not expensive and very convenient. Moreover, the WDCM should provide the software for the members to run their culture collection (e.g. BioloMics, iCollect). Therefore, the data obtained from the members will be the same format and standard.

Comments or suggestion on the training course

First of all, I would like to thank WDCM for this training. The accommodation is good and very convenient for us as it is very close to the Institute of Microbiology, CAS. I enjoy my stay in Beijing for 3 weeks. The living allowance is more than enough for food and also sightseeing in Beijing. However, I have some suggestions for the next training course. It would be excellent if the training course should have more practices in the laboratory or site visit. The period of training should be shorter than two weeks because most participants have to away from their work for long time and it is quite difficult for them to contact their offices as the internet connection in China is very restricted. More than four topics are welcome for each day.

Suggestions for further cooperation between WDCM and your collection.

Besides sharing only the microbial data, WDCM should encourage the members to share their microorganisms as well (e.g. type strains) or provide the system that helps member to get microbial strains via the WDCM website. The WDCM should help the culture collection member to establish the standard system for running their culture collections such as deposition, distribution, and maintenance protocols.