The 21st Asian Consortium for the Conservation and Sustainable Use of Microbial Resources (ACM 21)

The Berkeley Hotel Pratunam, Bangkok

19-21 November 2024

Meeting Report

Document prepared by

The Biodiversity-Based Economy Development Office (Public Organization)

or BEDO Thailand

The 21st Asian Consortium for the Conservation and Sustainable Use of Microbial Resources Meeting (ACM 21)

Rationale

The Asian Consortium for the Conservation and Sustainable Use of Microbial Resources Meeting (ACM) has been continuously held for over 20 years. Its primary objective is to promote collaboration among organizations in the Asian region to enhance the efficiency of conservation and sustainable use of microbial resources. The activities include:
1) Collaboration among biological resource centers 2) Promoting research and development of microbial resources and their industrial applications 3) Raising awareness about ACM activities 4) Developing human resources 5) Exchanging perspectives and information and
6) Organizing scientific meetings.

In 2024, the Thailand's Biodiversity-Based Economy Development Office (Public Organization) (BEDO) hosted the 21st ACM meeting from November 19–21, 2024, at the Berkeley Hotel Pratunam, Bangkok, Thailand. Delegates from nine member countries and region, including the People's Republic of China, Chinese Taipei, Indonesia, Japan, the Republic of Korea, Malaysia, the Philippines, Thailand, Vietnam, participated. The meeting presented research studies on microbial resources and exchanged management practices to optimize the utilization of microbial resources, fostering further collaboration and research development among the ACM members.

Objective

To exchange management practices and strategies for the effective use of microbial resources among ACM members in Asia.

Outcome

The meeting was inaugurated by Mrs. Suwanna Tiansuwan, Director General of BEDO, She delivered a welcome speech and officially opened the event. She also gave a special lecture on the topic, "Microbial Biodiversity: Opportunity, Crisis, and Responsibility." Additionally, Prof. Dr. Savitree Limthong from Kasetsart University delivered a special lecture titled, "How Exploration of Yeast Biodiversity Aids Yeast Taxonomy and Yeast Biotechnology."

Representatives and Participants from ACM member organizations in Asia, including from the People's Republic of China, Chinese Taipei, Indonesia, Japan, the Republic of Korea, Malaysia, the Philippines, Thailand, and Vietnam, along with representatives from Thailand organizations such as the Department of Agriculture, the National Center for Genetic Engineering and Biotechnology, the Thailand Institute of Scientific and Technological Research, Kasetsart University, and others, participated in the conference, totaling 143 attendees. Each member presented their research through Oral Presentations and Poster Presentations. Dr. Tanit Changthavorn, Advisor to BEDO, and Mr. Suwee Ngandee, Deputy Director General of BEDO, served as moderators during the conference sessions.



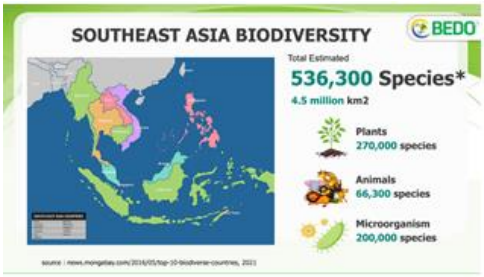

BEDO also organized a community product exhibition, showcasing products made from biological resources. This allowed participants to view product designs and purchase items of interest. On November 21st, representatives from member organizations, totaling 56 attendees, participated in a study visit on microbial resources at the National Science and Technology Development Agency (NSTDA) in Pathum Thani Province, Thailand.

Summary

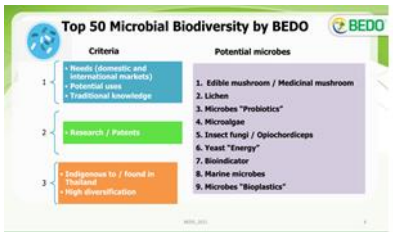
November 19th, 2024

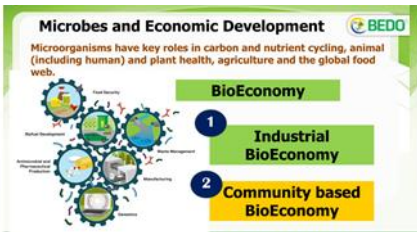
<u>Keynote Lectures</u>

Mrs. Suwanna Tiansuwan, Director General of BEDO on the topic **"Microbial Biodiversity: Opportunity, Crisis, and Responsibility."**



The biodiversity of Earth is extraordinary, with 1.8 million identified species distributed across approximately 130 million square kilometers. Bacteria and fungi contribute over 1 million species to this vast spectrum of life. Southeast Asia, including Thailand, is recognized as a biodiversity hotspot. Specifically, Thailand ranks 20th in the world, harboring 12,050 plant species, which constitutes 3% of the global plant diversity. In addition, more than 9,000 microbial species have been documented within the country. Ongoing exploration continues to unveil new species, with significant discoveries made between 2021 and 2022, emphasizing Thailand's pivotal role in global biodiversity conservation.





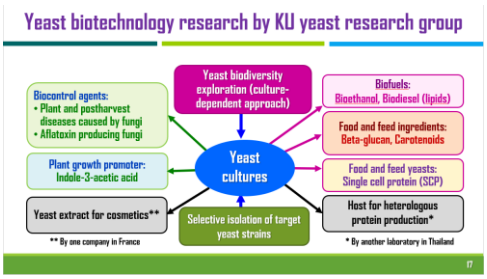
BEDO has collaborated with partners and experts to collect biodiversity data, verified the data, and input it into a database. This database serves as a valuable resource for various organizations and interested individuals. Additionally, BEDO has initiated the "TOP Biodiversity 50" project by inviting biodiversity experts and economists to jointly establish criteria for selecting the most significant microorganisms for bioeconomy development.

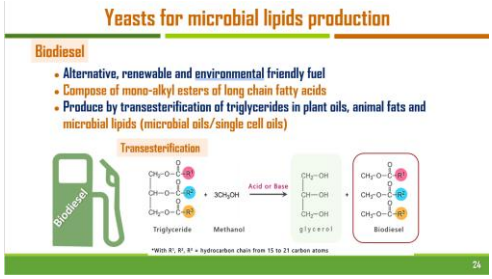
The project aims to promote the application of these microorganisms in both industrial sectors and communities, such as the indigo dyeing industry in Sakon Nakhon province. BEDO has been working with over 150 communities nationwide to create job opportunities and improve livelihoods.

Prof. Dr. Savitree Limtong, Department of Microbiology, Kasetsart University, delivered a lecture titled **"How Exploration of Yeast Biodiversity Aids Yeast Taxonomy and Yeast Biotechnology."**

Yeasts are single-celled fungi distributing across all ecosystems. Exploring yeast biodiversity can be conducted by surveying natural habitats and ecosystems, such as soil sediments, water, leaves, bark, mangrove ecosystems, peat swamp forests, and marine ecosystems. Two main approaches to researching yeast biodiversity in natural habitats are as follows:

1. **Culture-Dependent Approach**: This method involves isolating yeast cells from their habitats to obtain pure cultures, followed by species identification based on taxonomic criteria.
2. **Culture-Independent Approach**: This method involves extracting yeast DNA directly from samples and identifying the species through DNA analysis.



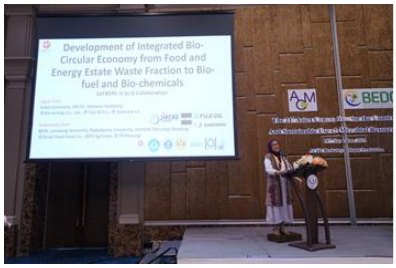


A comprehensive study on yeast biodiversity revealed the discovery of 62 new species within the Ascomycota phylum and 14 new species within the Basidiomycota phylum. These findings underscore the vast biodiversity of yeasts and their potential applications in various industries. Notably, several newly identified yeast species, such as *Kluyveromyces marxianus* and

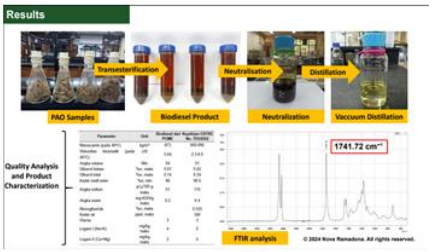
Saccharomyces cerevisiae, have shown promising potential for bioethanol production. Furthermore, yeasts like *Rhodospordiobolus fluvialis* and *Limtongozyma siamensis* have been identified as valuable sources for producing lipids and lipases, respectively. Additionally, certain yeast species, including *Papiliotrema aspenensis* and *Torulaspora indica*, have demonstrated biocontrol properties against plant pathogens. These discoveries highlight the significance of yeast biodiversity in promoting sustainable development and addressing global challenges.

Session of Interesting Topics I

Dr. Puspita Lisdiyanti, National Research and Innovation Agency (BRIN), Indonesia a lecture on the topic **" Development of Integrated Bio-circular Economy from Food and Energy Estate Waste Fraction to Bio-fuel and Bio-chemicals Using Microorganisms"**

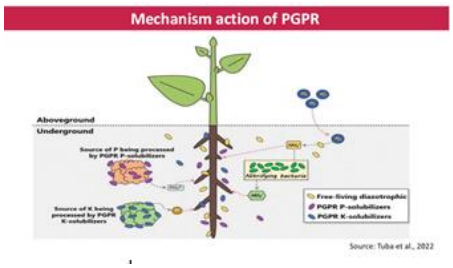


The Food and Energy Estate Project is one of Indonesia's national strategic initiatives, focusing on the integrated development of food and energy zones within large-scale agricultural areas. This concept involves cultivating a variety of crops, livestock farming, and energy resource management. The cultivation process generates significant amounts of waste (nearly 90% of plant material), such as wastewater, solid residues, and oil.
The project's success relies on waste management technologies, which pose a significant challenge in achieving sustainable agriculture, food security, and energy security.
The agricultural industry accounts for approximately 18% of total greenhouse gas emissions, contributing to global warming. To address these challenges, utilizing waste through integrated management is crucial for sustainable agricultural practices. The project adopts the concept of a **bio-circular economy**, which aims to maximize the use of renewable resources and create a closed-loop system for waste utilization.



Over five-year period from 2024 to 2028, under the SATREPS (Science and Technology Research Partnership for Sustainable Development) program supported by Japan, this research aims to efficiently utilize agricultural waste through microbial applications. The project focuses on converting agricultural residues into biodiesel using lipase enzymes, as well as producing bioplastics and polysaccharides through lignocellulolytic enzymes. The ultimate goal is to establish a new chemical industry model that integrates with sustainable agriculture practices.

Prof. Dr. Geok Hun Tan, Universiti Putra Malaysia (UPM), Malaysia a lecture on the topic **"Application of Biosolids with PGPR Cocktails as Biofertilizer in Landscape Plants"**



Biosolids, nutrient-rich organic materials derived from wastewater treatment (e.g., treated sewage sludge), can be utilized as biofertilizer for landscaping plants. Scientific research confirms that biosolids contain nutrients similar to those in animal manure. These biosolids can be enriched by incorporating beneficial microorganisms, such as Plant Growth Promoting Rhizobacteria (PGPR), which possess nitrogen-fixing capabilities, phosphate and potassium solubilization properties, and the ability to produce plant hormones. This enhances the quality of biosolids, making them a potent biofertilizer.

PGPR release chemicals into the soil to bind nutrients such as phosphorus, iron, and other essential elements. Experimental studies utilized biosolid samples, including:

1. IWK bio-pellets (laboratory version)
2. IWK bio-pellets (laboratory version) + IWK microorganisms (PGPR)
3. Chicken manure

4. Crude palm oil mill effluent (POME)
5. No biosolids (negative control)

These samples were tested on Marigold, Vinca, Japanese Rose, and Petunia.

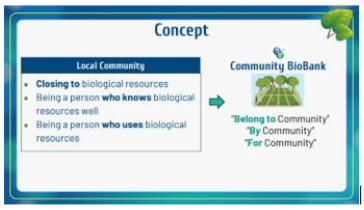
Due to the high carbon content in biosolids, they can stimulate the growth of PGPR, which promotes plant growth. The study revealed that mixing PGPR with biosolids (IWK bio-pellets) significantly enhanced the growth and longevity of ornamental plants, offering landscapers a cost-effective solution to reduce production expenses.

Dr. Takahide Ishida, National Institute for Environmental Studies (NIES), Japan a lecture on the topic **" Access and Benefit-sharing of Digital Sequence Information: Decision at CBD COP16"**

At the 15th Conference of the Party (COP15) to the Convention on Biological Diversity (CBD) in 2022, following the extensive discussion, the Parties reached a consensus to establish multilateral benefit-sharing mechanisms (MLM) for digital sequence information (DSI), which details were to be determined at COP16 (2024). Dr. Ishida provided a concise overview of the decision, highlighting the following points: 1) monetary benefit-sharing is primarily undertaken by medium- and- large-sized private companies with the new fund; 2) nonmonetary benefit-sharing is facilitated by matching system in the CBD clearing-house; and 3) public DSI databases are requested to provide MLM information to users and to collect DSI that complies with national legislation and the terms of the genetic resources that the DSI is derived.

<u>Session of Interesting Topics II</u>

Dr. Namphung Vongvanich, Senior Bioeconomy Development Officer, BEDO a lecture on the topic **"Community BioBank"**



A Community Biodiversity Bank serves as a repository for biological resources and local wisdom, with community participation in managing and preserving local biodiversity. This initiative focuses on conserving living resources to enable propagation and provides a resource hub for research and the development of biological diversity. It also acts as a learning center for communities, fostering protection and sustainable use of biodiversity.

The BioBank comprises three key components:

1. Living resources
2. Database system
3. Management of bank plots

Currently, there are 79 community BioBank networks across 39 provinces in Thailand.

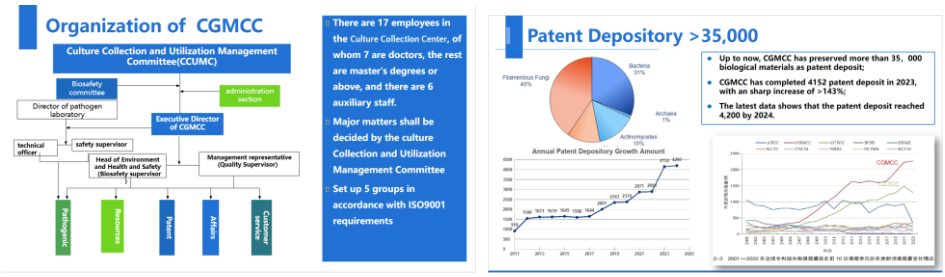
From the implementation of the Community BioBank project, it has been learned that the community is strong, with good leadership and collaboration within its networks. However, it was found that the community still lacks skills in data recording, technology usage, management, report writing, and financial documentation preparation. The Health Promotion Foundation (HPF) continues to develop the community's potential and works alongside experts to ensure data accuracy in accordance with academic standards. Additionally, it focuses on research studies for long-term preservation and promotes equitable access and benefit-sharing.

Dr. Seung Beom Hong, Korean Agricultural Culture Collection (KACC), Rural Development Administration, Republic of Korea, a lecture on the topic **" Korean Agricultural Culture Collection (KACC), Infrastructure of Agricultural and Food Microbial Industries"**

The Korean Agricultural Culture Collection (KACC) was established in 1995 to support research and industries in agricultural and food microbiology. KACC holds a collection of 28,614 microbial strains, including bacteria, fungi, mushrooms, yeasts, and plant viruses. Compared to other microbial culture collections or preservation centers, KACC has a significant number of plant-related microorganisms, such as plant pathogens and beneficial microorganisms for plants, as well as microbes used in food fermentation. In recent years, it has gathered a large collection of plant-beneficial microorganisms, which are increasingly important for agriculture. KACC provides services in conservation, distribution, and knowledge dissemination, such as microorganism collection and preservation, along with several essential supplementary services.

First, KACC creates and maintains databases such as the "List of Plant Diseases in Korea" and the "Fungal Terminology Dictionary" to attract more website visitors, leading to greater utilization of microorganisms. Second, KACC offers long-term conservation services for microorganisms used in industry to prevent the loss of industrial strains in South Korea. Third, it distributes microbial strains for industrial use, not limited to research and education, and these can be utilized without restrictions. Fourth, KACC manages the 'Microbial Culture Collection for the Purpose of National Patent Process,' preserving strains patented by four national patent collection centers in Korea. Furthermore, KACC is a pioneer in its mission and various roles as the national center for the preservation of agricultural and food microorganisms.

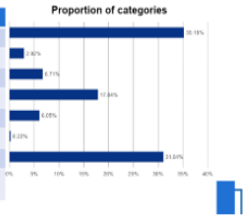
Dr. Yajing YU, China General Microbiological Culture Center (CGMCC), China a lecture on the topic **"Current Status and Development Trend of Strain Preservation in China"**



The China General Microbiological Culture Center (CGMCC) is the largest microbial culture preservation center in China, capable of storing over 2 million strains. It focuses on developing a high-quality data management system, emphasizing automation and fostering international

cooperation. CGMCC plays a crucial role in promoting the sustainable use of microbial resources. Its key missions include the collection, preservation, and distribution of microbial strains as the foundation for a biological resource center. The center maintains a collection of 79,000 strains and 35,000 patents. It offers services in biochemistry classification and analysis, antibiotic sensitivity testing, anti-mildew and bacteriostasis testing, freeze-drying ampoule production, other testing services, as well as training and consulting.

	Strain	Species	Genus
Bacteria	40330	8280	1609
Archaea	3349	458	105
Actinomycetota	7697	1733	197
Filamentous Fungi	20442	4242	1094
Yeast	6929	1073	240
Phage	261	-	-
Patent materials	35574	6962	1801
Open Collection Total	79,008	Total	114,582 strains



The future operations of CGMCC include:

1. Developing a more systematic high-quality strain storage system.
2. Becoming an institution with standardized practices.
3. Creating a data platform for connecting information with various organizations.
4. Developing an automated platform for strain isolation, cultivation, and screening.
5. Expanding international cooperation and exchanges

Dr. Kaoru Yamaguchi, NITE Biological Resource Center (NBRC), Japan a lecture on the topic **" Development of long-term preservation methods for microorganisms: focusing on algae and fungi"**

The National Institute of Technology and Evaluation (NBRC) preserves microorganisms using techniques such as L-drying (vacuum drying), freezing, and the serial transfer process. The serial transfer process carries risks of contamination and mutation, while freezing is beneficial for various classification groups but is not suitable for preserving temperature-

sensitive fungi, such as ectomycorrhizal basidiomycetes. The presentation will highlight long-term microbial preservation, focusing on algae and fungi. For algae, a simple method was tested using cardboard boxes placed in a Slow Freezing freezer (freezing at temperatures between -24°C to 0°C for an extended period). The samples were placed in the boxes and frozen. The results demonstrated that this simple method could be applied to various algae species, although a freezer is essential for preserving algae. For ectomycorrhizal basidiomycetes, NBRC has developed and modified the perlite protocol based on the method of Homolka et al. Additionally, the Vermiculite protocol has been developed by replacing perlite with vermiculite. This preservation method improves the survival rate of ectomycorrhizal basidiomycetes. Furthermore, NBRC preserves mycoparasitic mucoromycetes long-term by stimulating spore formation.

Dr. Zunita Zakaria, Institute of Bioscience, Universiti Putra Malaysia (UPM), Malaysia a lecture on the topic **"Experience sharing on implementation of laboratory accreditation in Malaysia"**

The adoption of laboratory accreditation based on the Industrial Product Standards (ISO/IEC 17025) in Malaysia, starting on July 1, 1987, marked a significant step towards ensuring quality, building credibility, reducing risks, and avoiding costly repeated testing in laboratory practices. The accreditation is managed by the Department of Standards of Malaysia under the Skim Akreditasi Makmal Malaysia (SAMM) program. This accreditation fosters confidence in operations both nationally and internationally.

The Putra University Malaysia was the first university in Malaysia to receive accreditation in 2008. The challenges faced included the need for investment in equipment and tools that complied

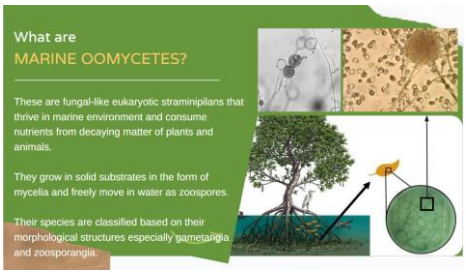
with ISO/IEC 17025 requirements, limitations due to budget support from government agencies, and insufficient personnel, which led to staff being responsible for multiple tasks simultaneously. However, the development of training programs and capacity-building for personnel was one approach that helped the laboratory achieve accreditation according to industrial product standards.

Session of Interesting Topics III

Dr. Hsiu-Jung Lo, National Infectious Diseases Bank (NIDB), National Health Research Institutes (NHRI), Chinese Taipei a lecture on the topic **"Azole – resistant *Candida tropicalis* Clade 4 Genotype Wildly Spreads in Asia"**

The fungus *C. tropicalis* Clade 4 is a major cause of candidemia, which leads to severe infections in humans. According to survey data from Chinese Taipei in 2014 and 2018, mutations in the *ERG11* gene result in azole resistance in *C. tropicalis* Clade 4. Additionally, *C. tropicalis* was found on the skin of fruits in supermarkets, suggesting that the fruit skin could act as a carrier for the fungus. Therefore, it is important to wash fruits thoroughly before consumption to prevent infection, especially for individuals with weakened immune systems. This fungus has also been found in several countries, including Australia, China, India, and Singapore. Furthermore, the spread of drug-resistant strains of this fungus requires further study to understand the mechanisms or causes of its transmission.

Dr. Mark Kevin Devanadera, University of Santo Tomas Collection of Microbial Strains (USTCMS), the Philippines a lecture on the topic **"Marine Microorganisms as Bio factories: Tapping Their Potential for Enhanced Feed Development"**



Microorganisms in the ocean are complex and diverse life forms that thrive in saline environments and play vital roles in marine ecosystems. They contribute to nutrient cycling in ecosystems, including carbon and nitrogen, and are essential for maintaining the integrity of marine ecosystems. Notable examples include:

1. Marine Protists – Single-celled organisms that are not plants, fungi, or animals, such as oomycetes and thraustochytrids.
2. Halobacterium – Bacteria responsible for the spoilage of high-salt foods.
3. Marine Yeasts – Valuable for the production of primary metabolites (e.g., proteins, carbohydrates, and fats) and secondary metabolites (e.g., carotenoids, vitamins, and other complex compounds) beneficial in industries like aquaculture. These yeasts enhance the effectiveness of fish feed, increase the levels of essential nutrients, and support the growth and development of aquatic life. In contrast, secondary metabolites, such as carotenoids and vitamins, contribute to health, improve immune responses, and enhance the safety of aquaculture species. Incorporating these metabolites into feed formulations can lead to improved growth rates, better feed conversion ratios, and overall better health of marine life.

Dr. Ha Nguyen, Institute of Microbiology and Biotechnology (IMBT), Vietnam National University, Vietnam a lecture on the topic **“Diversity of Lactic Acid Bacteria in Traditional Fermented Sausages and Their Potential Use of Starter Culture”**

Vietnam is one of the countries with a long history of food fermentation, such as pickled vegetables, yogurt, and various fermented fish products. Lactic acid bacteria (LAB) play an important role in fermented foods, such as inhibiting the growth of contaminating microorganisms in food and contributing to the flavor, texture, and aroma of the food.

This study aimed to investigate the diversity of lactic acid bacteria (LAB) in *lap xuong* sausages and assess the safety of LAB strains that could potentially be used as starters for food production. A total of 63 strains were isolated and classified into 14 species across 8 genera, with *Latilactobacillus sakei* and *Lactiplantibacillus plantarum* being the most commonly found species. *L. sakei* LM0405 and *L. plantarum* LM0705 exhibited good probiotic characteristics, and genomic analysis revealed no genes associated with the production of toxic substances or antibiotic resistance. However, these probiotic strains demonstrated resilience in the gastrointestinal tract, the ability to adhere to HT-29 cells (human colorectal cancer cells), and antibacterial and antioxidant properties. These strains can be used as microbial starters to improve the quality of *lap xuong* sausages.

Dr. Mika Miyashita, NITE Biological Resource Center (NBRC), Japan a lecture on the topic "**Visualization and utilization of the microorganisms involved in traditional Japanese fermented foods (Sake-manju) for quality improvement and quality control**"

Sakemanju is a traditional Japanese sweet that differs from other confections because its production involves fermentation using microorganisms, with 'moto' as the yeast starter, giving it a sake-like aroma. Studies have shown that the quality of moto depends on the activity of the microorganisms used in fermentation, such as yeast and lactic acid bacteria (LAB). Therefore, to improve quality, the microorganisms in the moto stored at traditional Japanese confectionery shops were analyzed.

Yeast, lactic acid bacteria, and aerobic bacteria were isolated from three moto samples: the previous day's moto, moto that had been squeezed to remove liquid, and moto in its dough fermentation form. The analysis revealed that the yeast *Saccharomyces cerevisiae* was the most prevalent, which is a safe species suitable for brewing. Several species of lactic acid bacteria were found, which could be used to develop yogurt. Aerobic bacteria were present in small quantities, as they can be inhibited by alcohol. This confirms that yeast isolation shows varying fermentation characteristics depending on the species, and it is anticipated that aerobic bacteria could also be useful for quality control.

November 20th, 2024

On November 20th, 2024, the task force report session and the General Assembly were held to report on the progress of their activities. The meeting was chaired by Mrs. Suwanna Tiansuwan, Director General of BEDO, co-chaired by Dr. Tanit Changthavorn, Advisor to BEDO and Rie Funabiki, ACM Secretariat. A total of 74 participants attended the meeting.

Task Force Reports

The chairs of the following task forces presented their activity that took place in 2023-2024.

1. Asian BRC Network - ABRCN
2. Human Resource Development (HRD)
3. Management of Material Transfer (MMT)

4. Mutual Aid Association (MAA)
5. BRC Standardization (BRCS)

General Assembly

At the General Assembly that followed by the task force report session, the ACM members welcomed the following four new members.

1. ABS Support Office, National Institute of Genetics (NIG), Japan
2. Agricultural Culture Collection of China (ACCC), Institute of Agricultural Resource and Regional Planning, Chinese Academy of Agricultural Sciences (CAAS), China
3. Guangdong Microbial Culture Collection Center (GDMCC), Institute of Microbiology, Guangdong Academy of Sciences, China
4. National Infectious Diseases Bank (NIDB), National Health Research Institutes (NHRI), Chinese Taipei

Dr. Seung Beom Hong of Korean Agricultural Culture Collection (KACC) presented the outline of ACM22 to be held in Korea in May, 2025, and Dr. Hsiu-Jung Lo of the National Infectious Diseases Bank (NIDB) proposed to host ACM24 in Chinese Taipei in 2027, and it was unanimously approved with a positive note.

The term of the ACM Secretariat expired at ACM21, and NBRC stepped forward again to serve as the Secretariat for the next three years. The ACM members unanimously welcomed and approved the proposal. Dr. Kawasaki of NBRC expressed NBRC's aspirations as the next ACM Secretariat.



<u>November 21st, 2024</u>

Excursion

BEDO led by Mr. Suwee Ngandee, Deputy Director – General of BEDO, Dr. Tanit Changthavorn, Advisor to BEDO, along with BEDO staff and employees, took a delegation of 57 meeting

participants from ACM for a field trip to the National Science and Technology Development Agency (NSTDA) in Pathum Thani province. The delegation visited the following departments:

1. National Biobank of Thailand (NBT)

Dr. Sitsadet Thongsima, Director of the National Biobank, welcomed the participants and presented the objectives of establishing the National Biobank. The biobank was established in 2019 as a national infrastructure to support long-term conservation of biological resources and to serve as a reserve biobank facility for the country to address potential crises that could lead to permanent loss of biological resources.



Dr. Nattawut Viriyathanawutwong and Dr. Thitiya Bunprateung led the delegation to visit the Biobank and Fungarium (Mushroom Museum) at the INC2 building, 1st floor, Tower A. The delegation learned about the objectives of the Biobank, which are as follows:

- Support the national infrastructure for the long-term conservation of biological resources.
- Enhance research capabilities and develop new innovations in long-term conservation.
- Serve as the country's reference source for utilizing data on stored biological resources.
- Create knowledge, databases, and analytical platforms to sustainably utilize the data.

Additionally, it was found that the Fungarium (Mushroom Museum) has the purpose of providing services for sample deposit and quality inspection. It serves as a repository for registered samples in the country and can issue sample numbers systematically. The facility has a traceability system with evidence at every step. Samples are checked for quality before they are imported and during the specified storage period. The service also includes the lending and returning of samples, which is exclusively for academic research purposes. Quality inspection of

samples is conducted at every step, with traceability through the ISO 9001:2015 certification system.

2. Thailand Bioresource Research Center (TBRC)

Mr. Suwanee Chunhametha, Technical Expert of the Microbial Systems and Bioinformatics Research Team, led a tour of the TBRC Exhibition Room (B815) on the 8th floor of the INC2 Building, Tower B. It was shared that TBRC is a central hub for the collection of biological materials and data, using internationally recognized management systems to support the optimal use of biological materials. The center also supports the conservation and sustainable use of biological materials in accordance with international regulations (Convention on Biological Diversity and Access and Benefit-sharing) while fostering national and international research collaborations on biological materials. Additionally, it focuses on developing personnel expertise in the preservation and management of biological materials.



Program At Glance

Time	Program
DAY 1 : 19th November 2024 at 11 Floor, Jubilee, The Berkeley Hotel Pratunam, Bangkok	
09:00-09:25	**Opening Remark and Keynote Speech "Conservation and Utilization of Bioresources"** **Speaker:** Mrs. Suwanna Tiansuwan, Director General Biodiversity-based Economy Development Office (BEDO), Thailand
09:25-10:00	**Keynote Lecture: How Exploration of Yeast Biodiversity Aids Yeast Taxonomy and Yeast Biotechnology?** **Speaker:** Prof. Dr. Savitree Limtong Department of Microbiology, Kasetsart University, Thailand
10:00-10:40	**Session of Interesting Topics [Poster Presentation]**
	Coffee break
10:40-11:00	**Development of Integrated Bio-circular Economy from Food and Energy Estate Waste Fraction to Bio-fuel and Bio-chemicals Using Microorganisms.** **Speaker:** Prof. Dr. Puspita Lisdiyanti National Research and Innovation Agency, Indonesia
11:00-11:20	**Application of Biosoilds with PGPR Cocktails as Biofertilizer in Landscape Plants.** **Speaker:** Assoc. Prof. Dr. Geok Hun Tan Institute of Bioscience, Universiti Putra Malaysia, Malaysia
11:20-11:40	**Streptomyces spp., a Potential Source of Bioactive Metabolites for Applications in Sustainable Agriculture.** **Speaker:** Dr. Hillol Chakdar National Agriculturally Important Microbial Culture Collection, India
11:40-12:00	**COP 16 Report** **Speaker :** Dr. Takahide Ishida National Institute for Environmental Studies, Japan
12:00-13:00	**Lunch**
13:00-13:20	**Community Biobank (BRC Management)** **Speaker:** Dr. Namphung Vongvanich Biodiversity-based Economy Development Office (BEDO), Thailand
13:20-13:40	**Korean Agricultural Culture Collection (KACC), Infrastructure of Agricultural and Food Microbial Industries** **Speaker:** Dr. Seung Beom Hong Korean Agricultural Culture Collection, Rural Development Administration, Republic of Korea
13:40-14:00	**Current Status and Development Trend of Strain Preservation in China** Speaker: Prof. Yajing YU Executive Director of China General Microbiological Culture Center (CGMCC), China
14:00-14:20	**Development of Long-term Preservation Methods for Microorganisms: Focusing on Fungi and Algae** **Speaker:** Dr. Kaoru Yamaguchi Biological Resource Center, National Institute of Technology and Evaluation (NBRC), Japan
14:20-14:40	**Experience Sharing on Implementation of Laboratory Accreditation in Malaysia Speaker:** Dr. Zunita Zakaria Universiti Putra Malaysia Microbial Culture Collection, Malaysia
14:40-15:20	**Member's Report [Poster Presentation]**

Time	Program
	Coffee Break
15:20-15:40	**Azole-resistant Candida tropicalis Clade 4 Genotype Wildly Spreads in Asia** **Speaker**: Dr. Hsiu-Jung Lo National Infectious Diseases Bank (NIDB), Chinese Taipei
15:40-16:00	**Marine Microorganisms as Biofactories: Tapping Their Potential for Enhanced Feed Development** **Speaker:** Dr. Mark Kevin Devanadera University of Santo Tomas Collection of Microbial Strains (USTCMS), Philippines
16:00-16:20	**Diversity of Lactic Acid Bacteria in Traditional Fermented Sausages and Their Potential Use for Starter Culture** **Speaker:** Dr. Ha Nguyen Institute of Microbiology and Biotechnology, Vietnam National University (VTCC), Vietnam
16:20-16:40	**Visualization and Utilization of the Microorganisms Involved in Traditional Japanese Fermented Foods (sake-manju) for Quality Improvement and Quality Control** **Speaker:** Dr. Mika Miyashita Biological Resource Center, National Institute of Technology and Evaluation (NBRC), Japan
18:30-20:00	**Welcome Dinner for ACM and AAAF**
DAY 2 : 20th November 2024 at 5 Floor, Kensington, The Berkeley Hotel Pratunam, Bangkok	
09:00-09:30	**Short Speech by ACM Members**
Taskforce Report and Discussion	
09:30-09:45	**Asian BRC Network (ABRCN)**
09:45-10:00	**Human Resource Development (HRD)**
10:00-10:15	**Management of Material Transfer (MMT)**
10:15-10:30	**Mutual Aid Association (MAA)**
10:30-10:45	**BRC Standardization (BRCS)**
General Assembly	
10:45-10:50	**Adoption of 20th ACM Minutes**
10:50-11:25	**New Membership Applicants**
11:25-11:35	**Next Term's ACM Secretariat**
11:35-11:40	**Host of ACM23 in 2026**
11:40-11:50	**ACM22 in Korea hosted by Korean Agricultural Culture Collection (KACC) Rural Development Administration, Republic of Korea**
11:50-11:55	**AOB**
11:55-12:00	**Closing Remark** **By : Dr. Hiroko Kawasaki, NITE Biological Resource Center (NBRC)**
12:00-13:00	**Lunch**