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Microbial Resource Center Network in ASEAN and along the Mekong River

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ASEAN member countries are located on the 4 biodiversity hotspots, "Indo-Burma, Sundaland, Wallacea, and the Philippines". This rich natural environment enables ASEAN member countries to generate economic value from its biological resources and enhance its competitiveness in emerging biotechnological fields such as green and clean technologies through research and development. Recognizing the potential application of microorganisms, every ASEAN member country is engaging in research into microbial utilization in various degree, some looking into the development of biopesticide, while others exploring the potential of microorganisms in pharmaceutical or green industrial applications. ASEAN member countries therefore are in a unique position and have high potential to develop bioeconomy to improve the livelihood of their populations.

An ASEAN Network on Microbial Utilization (AnMicro) http://www.anmicro.org was established in 2014 under the auspices of ASEAN Sub Committee on Biotechnology to foster scientific collaboration and strengthen research and human capacity in the field of microbial utilization among academic and research institutes in ASEAN, as well as facilitating dialogues and joint activities between ASEAN and other international organizations. Since its inception, AnMicro has made considerable progress, with the membership has grown to 21 organizations from 8 countries in ASEAN (as of May 2023). AnMicro has been actively promoting the practice of Microbial resource management through training of iCollect (a software uniquely designed for the management of biological collections) which is directly linked to World Data Center of Microorganisms (WDCM). AnMicro and ASEAN Center on Biodiversity (ACB) also launched a project led to an establishment and maintenance of microbial data collection in each ASEAN country, so-called AmiBase (http://Amibase.org). This will enable access to a larger pool of microbial data which were previously kept individually in different formats, subsequently accelerating discoveries and innovations to underpin the development of bioeconomy. AnMicro has established a linkage with other international networks including Asian Consortium for the conservation and sustainable use of Microbial resources (ACM), Asian Network of Research Resource Centers (ANRRC), World Data Center for Microorganisms (WDCM) and World Federation for Culture Collections (WFCC).

In this talk, one of the international scientific networks in the region extended from the ACM and AnMicro will be presented. This network has focused on the exploration of the diversity of microorganisms in the area of the Mekong River. The River covers a distance of approximately 5000 Km from the Tibetan Plateau where it originates to Mekong Delta, and flows through six countries, namely China, Myanmar, Thailand, Lao PDR, Cambodia and Vietnam. Funded by the Lancang Mekong Cooperation (LMC), the project has joined by Institute of Microbiology, Chinese Academy of Science (IMCAS), China, National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand and Vietnam National University, Ho Chi Minh (VNUHCM) University of Science, Vietnam. This project aims to use metabarcoding to assess taxonomic richness and abundance of microorganisms and their related ecological communities in the Lancang-Mekong River. The metabarcoding methods has been used to analyze the microbial community (or microbiome) composition at three different areas of the Lancang-Mekong River: the upstream of the river in China, the central part of the river in Thailand, and the downstream area in Vietnam before entering the South China Sea. The data and analysis results contributes to an establishment of biodiversity knowledgebase and new ecological

molecular indices for Mekong river ecosystem. The project has been successful mainly due to a collaboration between governmental sector, academic scientists, and citizen-scientists living in the Lancang-Mekong basin. The project has also set up the " Citizen Science" program to raise awareness of science-driven and ecologically-sustainable conservation of Mekong biodiversity.