Molecular Diversity of Microbial Communities in Rice Paddy in Viet Nam and Taiwan

1. Title of Project：Molecular Diversity of Microbial Communities in Rice Paddy in Viet Nam and Taiwan.

2. NPUST Research Team Members

Department	Name	Position
Department of Biological Science and Technology	Douglas JH Shyu	Associate Professor

3. Invited International Teachers and Students

Title of International School	Department	Name	Position
Thai Nguyen University of Agricultural and Forestry	Department of Biotechnology	Nguyen Xuan Vu	Lecturer /Dept. Head
		Vu Thi Thanh Hang	Lecturer

4. Content of Research or Internship

The Cross-Nation Research Pilot Project was performed in cooperation with two scholars, Dr. Nguyen Xuan Vu, the head of Department of Biotechnology, and Ms. Vu Thi Thanh Hang, from Thai Nguyen University of Agricultural and Forestry in Viet Nam. The project focused on the study of microbiome in the rice rhizosphere due to Oryza sativa L. is a very important food crop both in Taiwan and in Viet Nam. The main goals of the project include the analysis of microbial community differences in rice rhizosphere from various areas, the isolation of plant growth-promoting bacteria, which is beneficial for the growth and development of rice, and the development of biofertilizer.

The application and utilization of biofertilizer will practically reduce the use of chemical fertilizer and pesticide, and add value for the maintenance of the ecological system.

5. Description of Performance

More than 90% of the rice in the world was produced and consumed in the Asia-Pacific Region. The main rice cultivation areas are located at Changhua plain and Jianan Plain in Taiwan, while those are located at Mekong Delta of Southern Viet Nam and Red River Delta of Northern Viet Nam, respectively. The soils of rice rhizosphere from various locations were collected as samples for the comparison of microbial community diversity and for the isolation of plant growth-promoting bacteria based on the cultivars, seasons, climate and temperature changes, cultivation areas, soil properties, the use of fertilizers and pesticides, hydrology, and the growth conditions of rice.

Dr. Nguyen Xuan Vu and Ms. Vu Thi Thanh Hang, from Department of Biotechnology at Thai Nguyen University of Agricultural and Forestry in Viet Nam, visited Department of Biological Science and Technology at National Pingtung University of Science and Technology between 14th October 2018 and 27th October 2018 for two weeks. As the short-term research fellowships, they joined Meet The Faculty Seminar on 15th October and gave us the lectures on 26th October. The education and academic research collaboration between two departments were also discussed. We all agreed to sign the Memorandum of Understanding and the Memorandum of Agreement to promote academic exchange activities such as student studying exchange, faculty teaching and research exchange, development of dual degree programs for the bachelor and master students, development of academic and training programs, and research project collaboration and transfer of technology. We believed that the coordination of academic activities between two departments would enhance cooperation in the biotechnology-related fields of mutual interests.

Figure 1. Meet The Faculty Seminar held on 15th October 2018 at BT304 of Department of Biological Science and Technology. Dr. Nguyen Xuan Vu (Right), the head of Department of Biotechnology, and Ms. Vu Thi Thanh Hang (Center), from Thai Nguyen University of Agricultural and Forestry in Viet Nam, and Dr. Douglas JH Shyu (Left) , the principle investigator of Functional Genomics Lab at Department of Biological Science and Technology in National Pingtung University of Science and Technology.

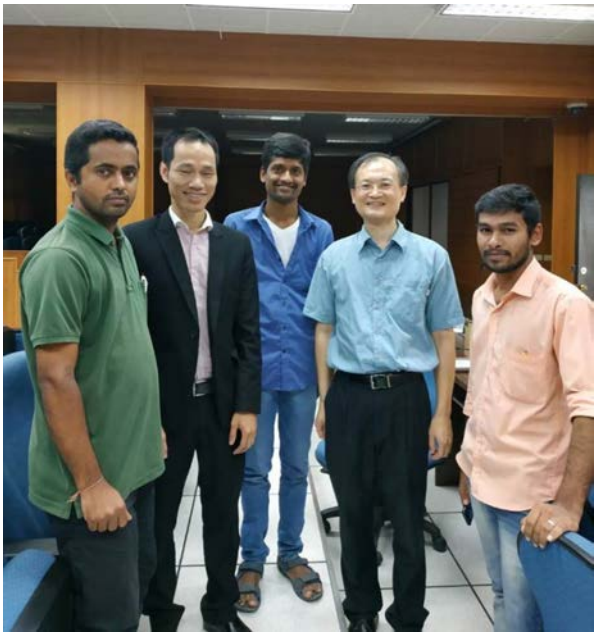

Figure 3. Dr. Nguyen Xuan Vu (2nd Left), Dr. Douglas JH Shyu (2nd Right), and the PhD students from Periyar University in India planned and discussed the promotion of academic activities, at BT304 of Department of Biological Science and Technology, including the research project collaboration, faculty exchange, and student exchange.

Figure 2. Students from Functional Genomics Lab joined Meet The Faculty Seminar held on 15th October 2018 at BT304 of Department of Biological Science and Technology. Dr. Nguyen Xuan Vu (2nd Right), Ms. Vu Thi Thanh Hang (4th Right), and Dr. Douglas JH Shyu (4th Left).

Figure 4. Two Invited Lectures held on 26th October 2018 at BT304 of Department of Biological Science and Technology.