Report

Course Title: Duckweed Holobiont interaction and function enhancement

Assist. Prof. Dr. Chanita Boonmak

8 – 26 May 2023

Knowledge Co-Creation Program (Country Focus) under JICA Technical Cooperation Project Science and Technology Research Partnership for Sustainable Development (SATREPS) entitled “The Project for Development of the Duckweed Holobiont Resource Values towards Thailand BCG Economy (Be-HobiD)”

Trainee Report of Assist. Prof. Dr. Chanita Boonmak

in Japan 15 – 26 May 2023

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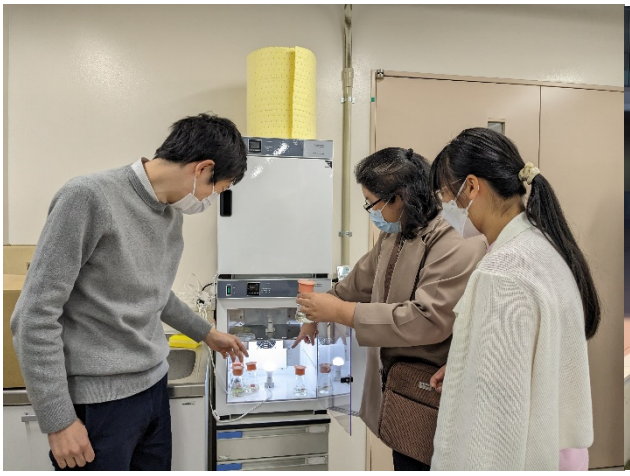
At University of Hyogo and Osaka University (8 – 12 May 2023)

1. To learn to analyze microbial community and functional analysis at University of Hyogo

Assist. Prof. Hidehiro Ishizawa taught about microbiome analysis using program R, including processing of amplicon sequencing data, methods for ordination, and PERMANOVA. I am very grateful to Dr. Ishizawa for providing the teaching materials and codes for program R. This knowledge will be very useful for my duckweed research.

Dr. Ishizawa showed cultivating conditions for a variety of duckweed. I had a great time for exchange experience with Japanese professors and students in University of Hyogo.



2. To learn to use *Wolffia* area calculator at Osaka University

During my stay at Osaka University, I had a great time exchanging research ideas with Prof. Michihiko Ike and Assoc. Prof. Daisuke Inoue about synthetic community and using predatory bacteria as biocontrol for plant growth-inhibiting bacteria. I also had a chance to discuss research works with the duckweed team in Ike laboratory. Thank you very much for introducing an online *Wolffia* area calculator which is very convenient and useful for measurement of duckweed growth.

At Hokkaido University (15 – 26 May 2023)

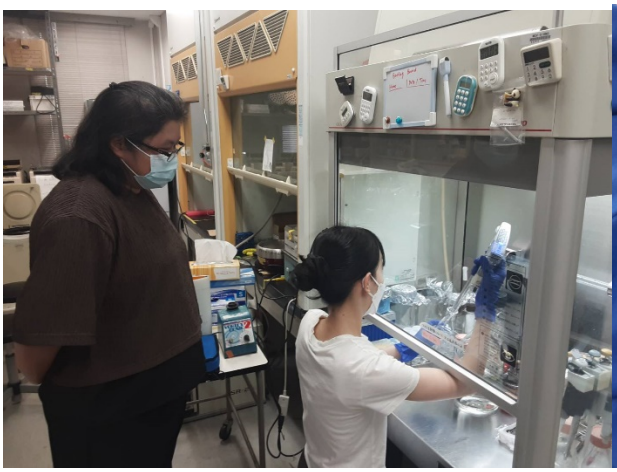
I'm so thankful to Prof. Masaaki Morikawa for accepting me to visit his laboratory. I learned several techniques which are useful for my future research.

1. To learn to measure duckweed growth by using surface coverage.

Hence *Wolffia* frond is very small, surface coverage of the duckweed can be used as one of growth parameters. At Morikawa laboratory in Hokkaido University, I learnt about evaluation of duckweed growth by using the program ImageJ and Ilastik. The later one comes with machine learning algorithms which makes it easy to track and count small frond are and remove background. It can also deal with large datasets.

2. To learn to examine microalgal growth inhibition and functional compounds of plant growth-promoting bacteria (PGPB)

Here, I learnt about methods for screening of microalgal growth inhibiting bacteria using co-cultivation technique, and analysis of the relevant bioactive compounds of augmented bacteria using HPLC. I am quite new to this field. These knowledges would greatly benefit to my future research.




3. Exchange experience with Japanese professors and students.

I also had chance to exchange research experiences and discussed with many young researcher and students who study about duckweed-bacteria interaction.