Short-Term Expert Report
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Dispatched period: 15 April - 12 June, 2026

This report summarizes the activities and outcomes of my research stay at Kasetsart University from April 15 to June 12, 2026. The purpose of this visit was to advance research on a Duckweed–Plant Growth-Promoting Bacteria (PGPB) Holobiont System for sustainable biomass production and wastewater treatment.

I conducted a two-month research stay at Kasetsart University from April 15 to June 12, 2026, to promote the development of a Duckweed–Plant Growth-Promoting Bacteria (PGPB) Holobiont System for sustainable biomass production and wastewater treatment.

During my stay, I introduced duckweed holobiont technology, which enhances duckweed growth through the use of beneficial bacteria. This system combines bacteria that directly promote duckweed growth with bacteria that suppress microalgae, thereby reducing nutrient competition and improving duckweed productivity (Pham et al., Bioresource Technology, 2025).

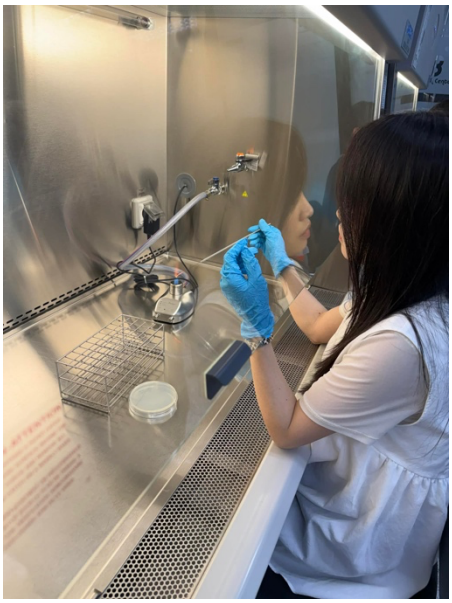
Presentation of duckweed holobiont technology and the research plan to Professor Dr. Chart and his research team.

I also presented my research plan involving selected PGPB strains from Hokkaido University and Kasetsart University for duckweed cultivation and wastewater treatment. Together with Assistant Professor Dr. Chanita and Professor Dr. Chart, who are project members, I discussed the progress and preliminary results of the project and evaluated experimental approaches to better understand the system and improve its performance.

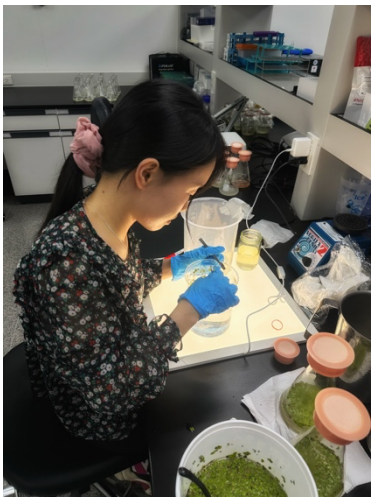
Professor Dr. Chart presented the progress and preliminary results of duckweed cultivation in a wastewater treatment system at Kasetsart University.

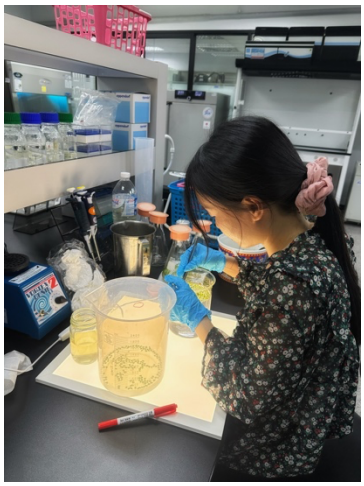
In addition, I conducted experiments at the DHbRC laboratory to select duckweed growth-promoting bacteria and assess their application in a pilot-scale wastewater treatment system. The project aims to develop and validate a duckweed PGPB co-cultivation system for enhanced biomass production and improved wastewater treatment efficiency

Preparation of culture media for bacterial cultivation as part of laboratory experiments conducted at the DHbRC Laboratory.



Bacterial cultivation on agar plates conducted in the DHbRC Laboratory.





Selection of duckweed fronds and preparation of a co-cultivation experiment with plant growth-promoting bacteria (PGPB)

Discussion of the results of duckweed cultivation in wastewater with Professor Dr. Chart and his research team

This research visit provided valuable insights into the development of a duckweed–PGPB co-cultivation system for sustainable biomass production and wastewater treatment. Through discussions with project members and laboratory experiments, we refined the experimental design and improved our understanding of the interactions among duckweed, beneficial bacteria, and wastewater environments.

I will continue this research during my next visit to Kasetsart University