“Watermeal, the future food source for space exploration”
HyperGES Programme 2020

Tatpong Tulyananda, Ph.D.
Mahidol University, THAILAND
tatpong.tul@mahidol.edu
Our Goals

Plant Biology & Astroculture Laboratory

- Find a suitable plant for oxygen and biomass production for space travel or colonization
- Optimal condition development for plant culture, least energy input while maintain good yield
- Long-term seed storage for space travelling, especially for high-quality Thai rice seedstock.
- Watermeal is being observe as a model for space-related plant research
Thailand NSE program:

- To study Asian watermeal (*Wolffia globosa*) under microgravity as a possible candidate for food and oxygen production in future space exploration
- Launching expected 2021-2022
AHiS program (Project 1):

- Nation-wide space project by JAXA and NSTDA
- Comparing Thai herb grown under controlled environment on earth in parallel with ISS-grown plants
- Launched Nov 2020
AHiS program (Project 2):

- To study impact of cosmic radiation on legume embryo mutation, seed viability and germination
- Seeds will be exposed in JAXA’s KIBO module before germination
- Launched Nov 2020
HyperGES 2020:

- Study adaptation and yield of Asian watermeal under hypergravity environment
- ESA’s LDC enable a long-term gravitational-controlled study
- Scheduled by 2021
HyperGES 2020:

• Watermeal chamber designing and production under nation-wide collaborations
HyperGES and community impacts

- Expand space-related knowledge and awareness in Thailand
- Flagship program in astroculture, produce intensive research environment
- Team up with other organization. Stepping out of their comfort zone encouragement
Thank You

Tatpong Tulyananda, Ph.D.
Faculty of Science
Mahidol University, THAILAND
tatpong.tul@mahidol.edu