



“Watermeal, the future food source for space exploration”

HyperGES Programme 2020

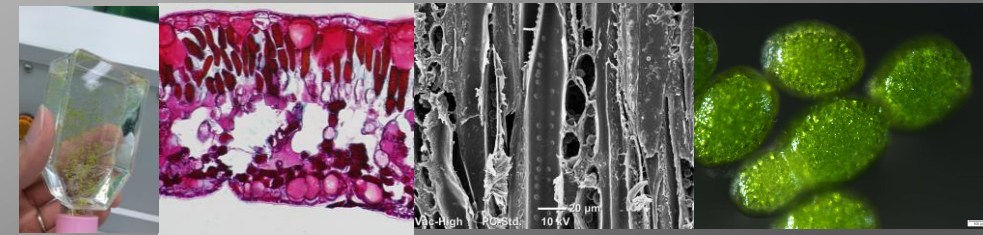
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Plant Biology & Astroculture Laboratory (PBA lab)
School of Bioinnovation & Bio-based Product Intelligence
Faculty of Science, Mahidol University



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



Plant Biology & Astroculture lab Current Projects



National Space Exploration (NSE)

HyperGES

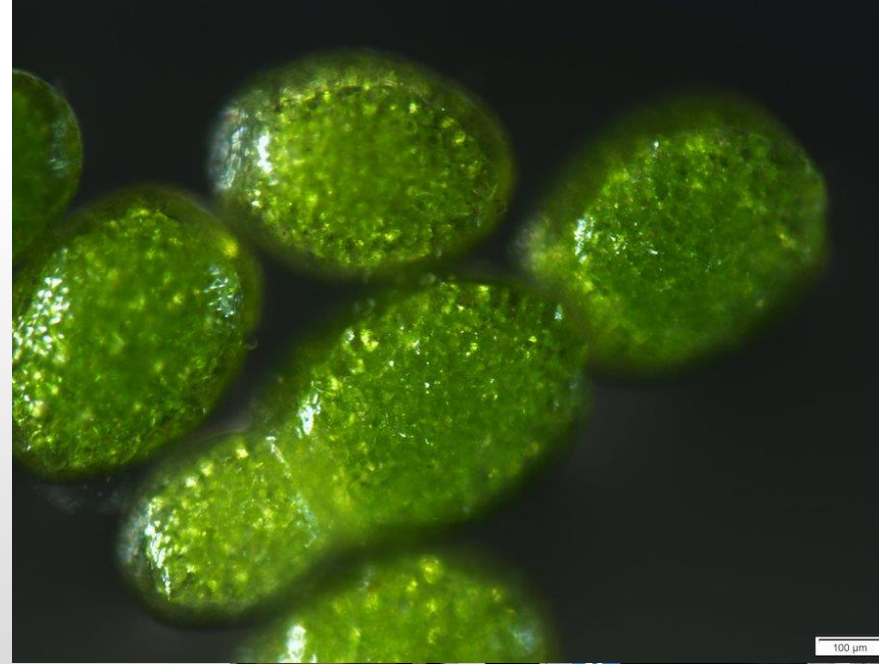


AHiS



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



Credit: Dr. Phanchita Vejchasarn
Rice Department

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



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HyperGES 2020:

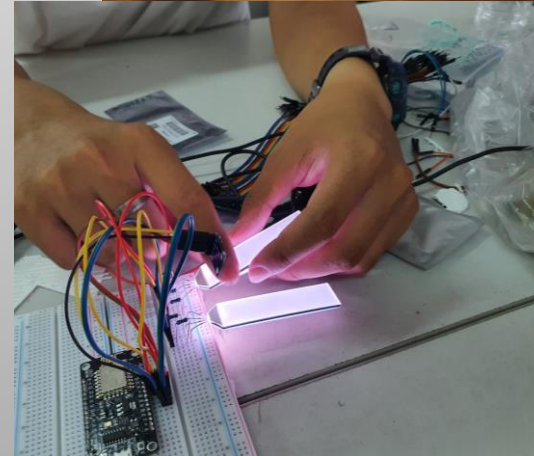
- Study adaptation and yield of Asian watermeal under hypergravity environment
- ESA’s LDC enable a long-term gravitational-controlled study
- Scheduled by 2021



HyperGES “Watermeal, the Future Food Source for Space Exploration”

HyperGES 2020:

- Watermeal chamber designing and production under nation-wide collaborations



HyperGES “Watermeal, the Future Food Source for Space Exploration”



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

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