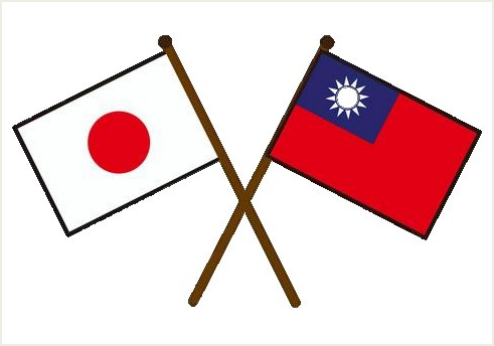


Welcome to

Department of Horticultural Science

National Chiayi University

香川大学 KAGAWA UNIVERSITY

NCYU 國立嘉義大學 NATIONAL CHIAYI UNIVERSITY

2024.12.03 @ National Chiayi University

Lunch meeting

1. **Remark** – Prof. Rong-Show SHEN, Dean of College of Agriculture, National Chiayi University
2. **Remark** – Prof. Peter LUTES, Chair of the International Exchange Committee, Kagawa University
3. **Remark and faculty introduction** – Prof. Pai-Tsang, CHANG, Chair of Department of Horticultural Science, National Chiayi University
4. **Gifting**
5. **Department and laboratory introduction** – by each faculty, Department of Horticultural Science, National Chiayi University
6. **Kagawa University introduction** – by Prof. Peter LUTES
7. **Member discussion**
8. **Lab visiting after the meeting**

About Department of Horticultural Science

- The department was first established in 1948, with bachelor's degree and master's degree programs (doctoral degree program is set in college level)
- 4 Professors, 1 associate professor, 6 assistant professors and 1 adjunct assistant professor (~2024)
- Research specializations including floriculture, olericulture, pomology, postharvest, processing, and landscape
- Research founding from 2022-2024 achieved 57,364,780 NTD (≈262,764,240 JPY)
- 3 Practice fields for skill training, horticultural technology center for course and research support

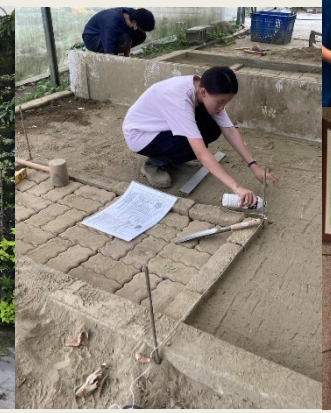










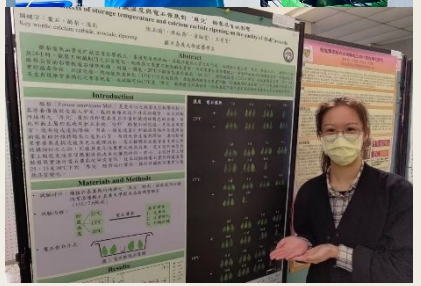


Master’s degree program

- Two-year program, two semesters in a year
- The first semester starts from August, the second semester starts from February
- One semester includes 18-week lectures
- One class for 50 min as 1 credit
- 30 credits are required for graduation
  - *Required courses: 4 credits*
  - *Elective subjects: 20 credits*
  - *Thesis: 6 credits*
- Publication is necessary as Graduation requirements (journal publication or conference paper are both accepted)







Research Area: Horticultural Science
Research Specialization: Floriculture
Name: SHEN, Rong–Show (Prof.)



Recent Research

Primarily research focuses on floricultural technology, plant tissue culture and flowering physiology. Recent studies including the following objectives:

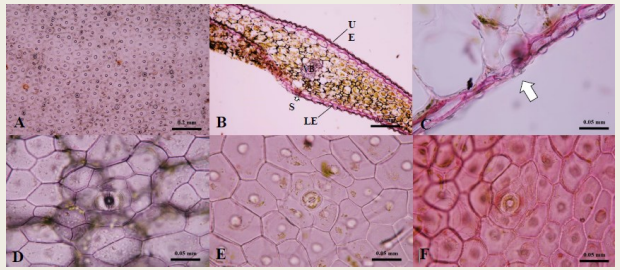
- Screening for disease resistance in *Impatiens walleriana* (African impatiens).
- Breeding of *Phalaenopsis* and *Polianthes tuberosa*.
- Establishment of regeneration system via micropropagation in new flower color vinca (*Catharanthus roseus*).
- Taxonomic revision of Tricyrtis (*Liliaceae*) in Taiwan and a new species, Tricyrtis lingyunyanensis.
- Effects of Paclobutrazol on Reproductive and Vegetative Traits of *Phalaenopsis*.

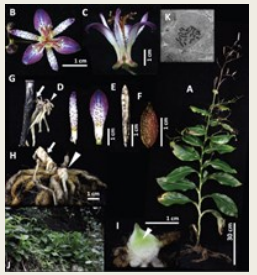








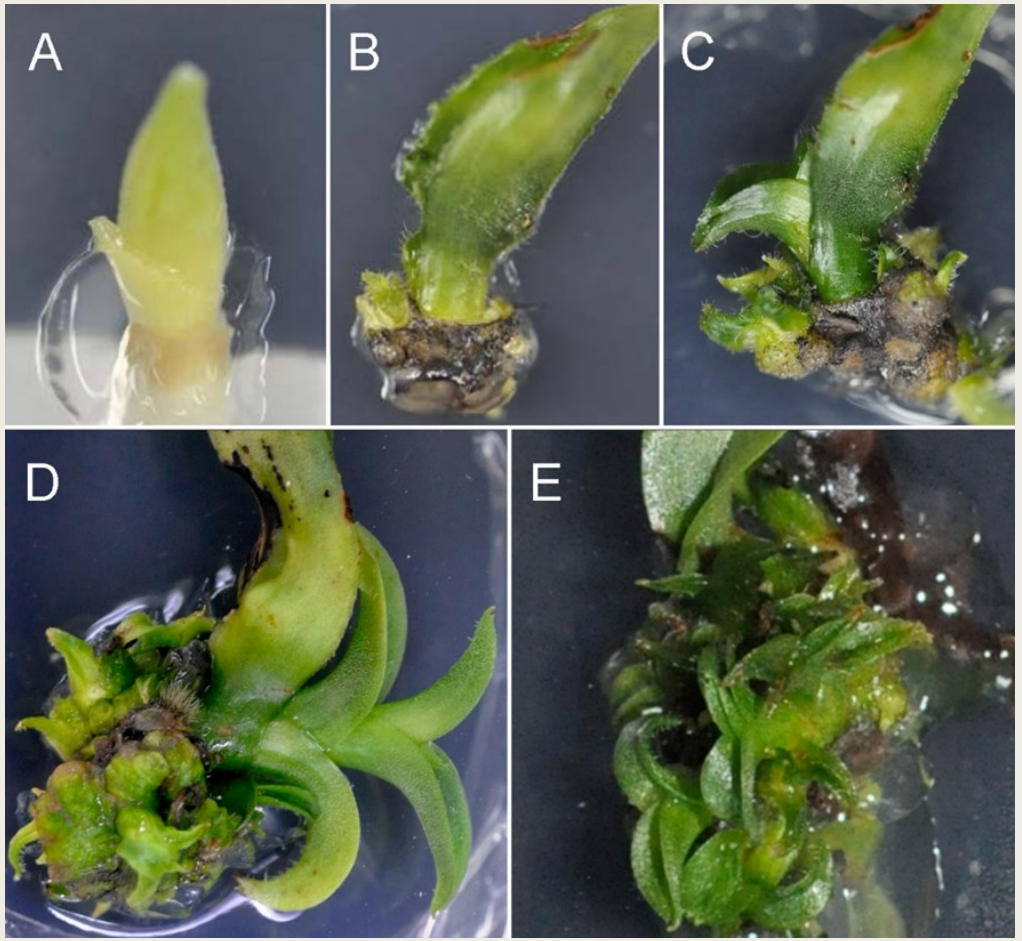


Keywords: Plant tissue culture, Breeding, *Phalaneopsis*, *Catharanthus roseus*

Research Area: Horticultural Science
Research Specialization: Establishment and application of orchid gene transfer and tissue culture systems
Name: Hsu, SHAN-TE (Prof.)

Recent Research

- Do, V. N. T., Hsu, S. T., & Lee, Y. I. (2019). Clonal propagation *in vitro* of *Paphiopedilum* hybrids from adult plants. HortScience, 54(9), 1565-1569.
- Chen, W. A., Hsu, S. T., & Lee, Y. I. (2024). Embryology of a lady's slipper orchid, *Paphiopedilum spicerianum* and cytokinin requirements for seed germination and protocorm development. HortScience, 59(8), 1158-1164.
- Preliminary Commercial Production and Market Test of Diverse Clones in *Paphiopedilum* Subgenus *Parvisepalum* Hybrids



Keywords: asymbiotic germination, micropropagation, cultivation management, flowering regulation

Research Area: Horticultural Science
Research Specialization: Floriculture
Name: HSU, Yanghsin (Asst. Prof.)

Recent Research

- The mechanisms and Genes determine flower colors

  - *Phalaenopsis*, *Vanda*, etc.

- Plant breeding for abiotic stress tolerances

  - *Anthurium*, *Viola*, etc.

- Establishment of health seedling-producing systems

  - *Anthurium* and gloriosa lily

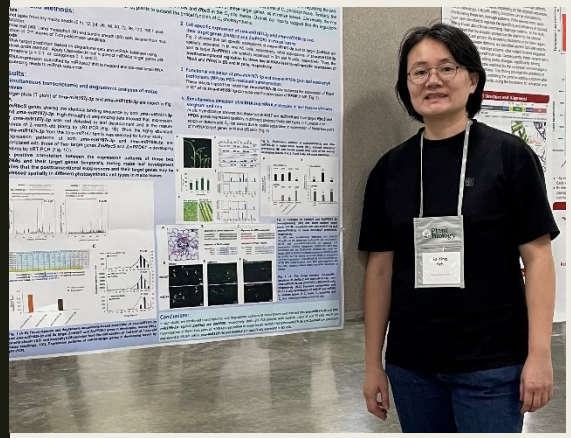
- Effect of plant growth-promoting bacteria (PGPB) on growth of flower crops under abiotic stress

  - *Oncidium* and *Anthurium*

Keywords: anthocyanin, PGPB, abiotic stress tolerance

Phalaenopsis anthocyanin analyses

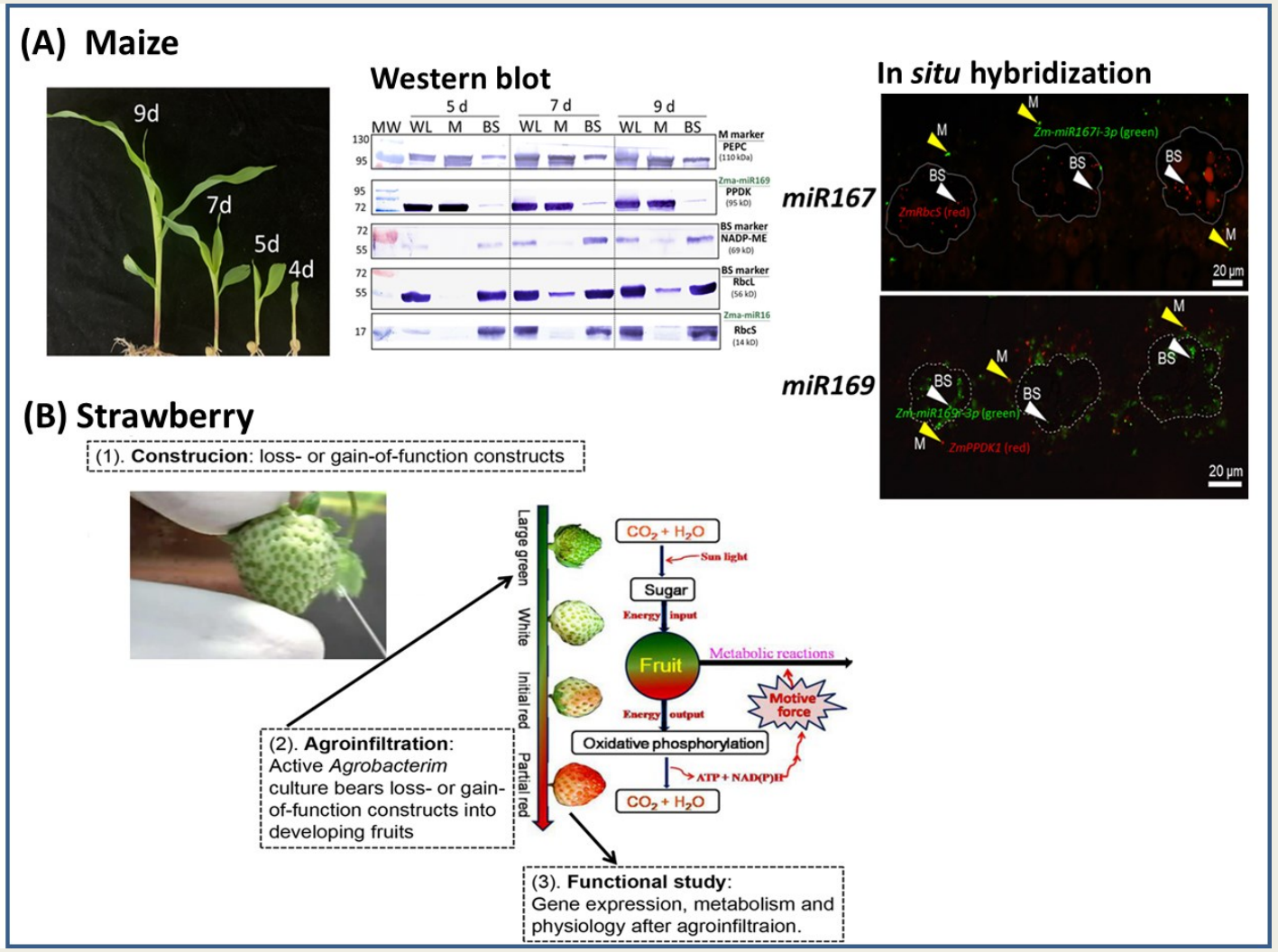
Effect of PGPB on growth of *Petunia*



Research Area: Horticultural Science
Research Specialization: Olericulture
Name: Yeh, Su-Ying (Asst. Prof.)

Recent Research

- Development of plant-based bioactive compounds (e.g.,peptides) for enhancing vegetable growth and tolerance stresses
- Regulation of cell-specific expression of C_4 photosynthesis genes in maize leaves by microRNAs
- Functional studies of transcription factor genes in strawberry

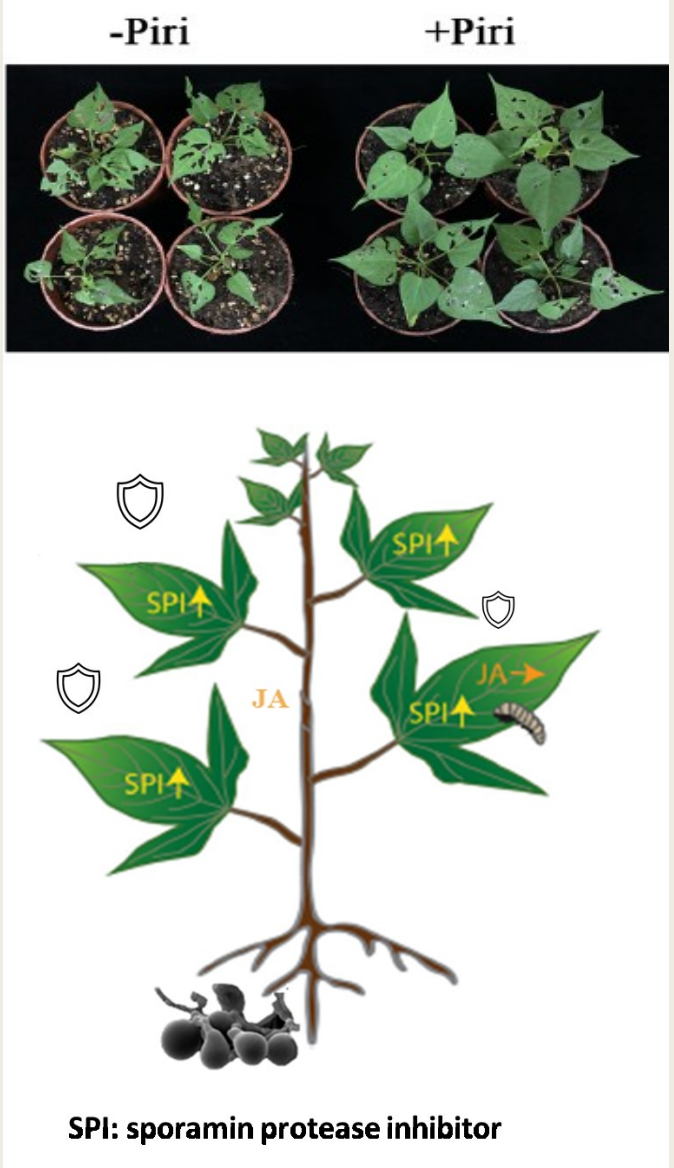


Keywords: maize, strawberry, transcription factor genes, microRNAs

Research Area: Horticultural Science
Research Specialization: Olericulture
Name: Chen, Shi-Peng (Asst. Prof.)

Recent Research

- Identification of the effector proteins from *P. indica* (endophytic fungus) in regulating growth or herbivore defense of sweetpotato.
- Identification and application of plant growth-promoting rhizobacteria and endophytes for sweetpotato production.
- Characterization of DMNT (homoterpene volatile) synthesis-related genes in sweetpotato under wounding.



Keywords: sweet potato, herbivore defense, plant growth-promoting microorganisms

Research Area: Horticultural Science
Research Specialization: Pomology
Name: P.T. Chang (Prof.) and Y.L. Jiang (Assoc. Prof.)

Recent Research

- The Citrus industry counseling and promotion
- Pitaya cultivation
- Atemoya storage
- Passion fruit coloration
- Soil and plant nutrition
- GlobalGAP promotion

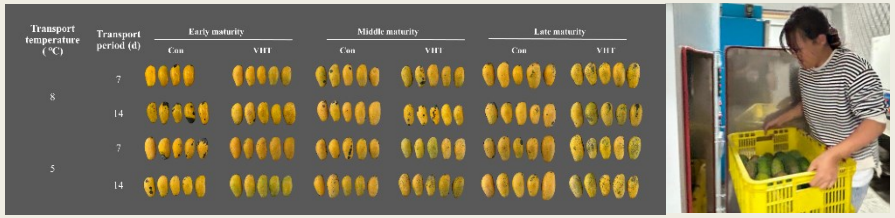
Keywords: Pomology, fruit, fertilization.

Research Area: Horticultural Science
Research Specialization: Postharvest
Name: WANG, Hsiaowen (Asst. Prof.)

Recent Research

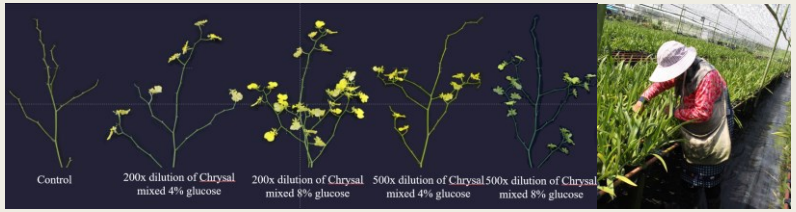
- Evaluation of local Taiwan mango cultivars for exporting and storage ability
- Establish the harvesting maturity standard and optimize the storage and transportation technologies for Taiwan avocado
- Quality enhancement in avocado fruits through artificial ripening treatment
- Harvest maturity and quality assessing
  - Nondestructive technology (with NIR) in avocado fruit (cooperate with Taipei Medical University)
  - 3D photogrammetry technique in mango fruit (cooperate with department of electrical engineering, NCYU)
  - Deep learning based quality prediction in mango fruit (cooperate with department of electrical engineering, NCYU)
- Effects of glucose ratio in preservative on the quality of *oncidesa* gower ramsey 'Honey Angel' cut flowers

Keywords: avocado, mango, postharvest physiology, artificial ripening treatment, quarantine, AI and nondestructive methods, intelligent horticulture

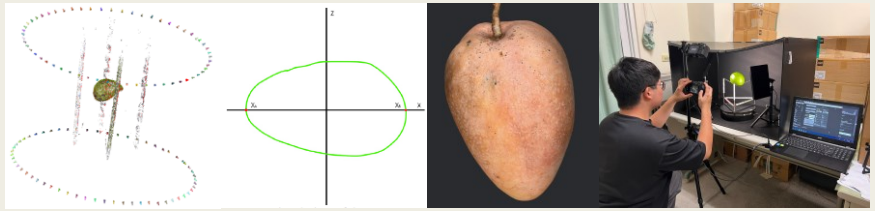


Evaluating the feasibility of local mango cultivar for exporting

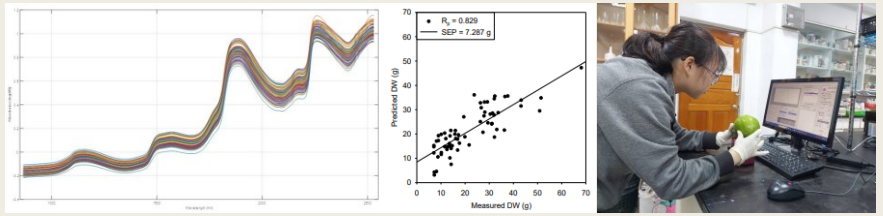
Fruit ripening and quality in different harvest maturity



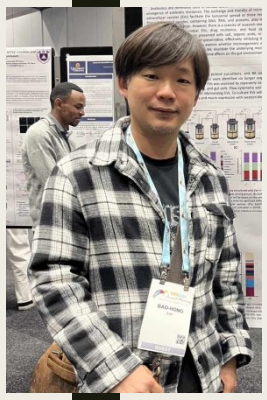
Vase-life test of 'Honey Angel' in different preservatives (16d)



3D photogrammetry technique for harvest maturity assessing in mango fruit



NIR for dry matter estimation in avocado fruit



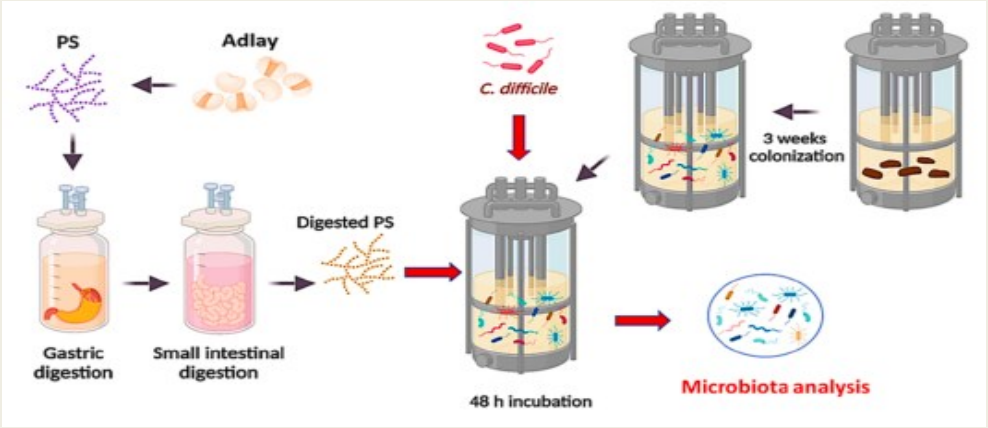
Research Area: Processing of Horticultural Crops
Microbial Applications and Development in Next-Generation Probiotics
Mushroom Cultivation

Research Specialization: Extracellular vesicles/exosome

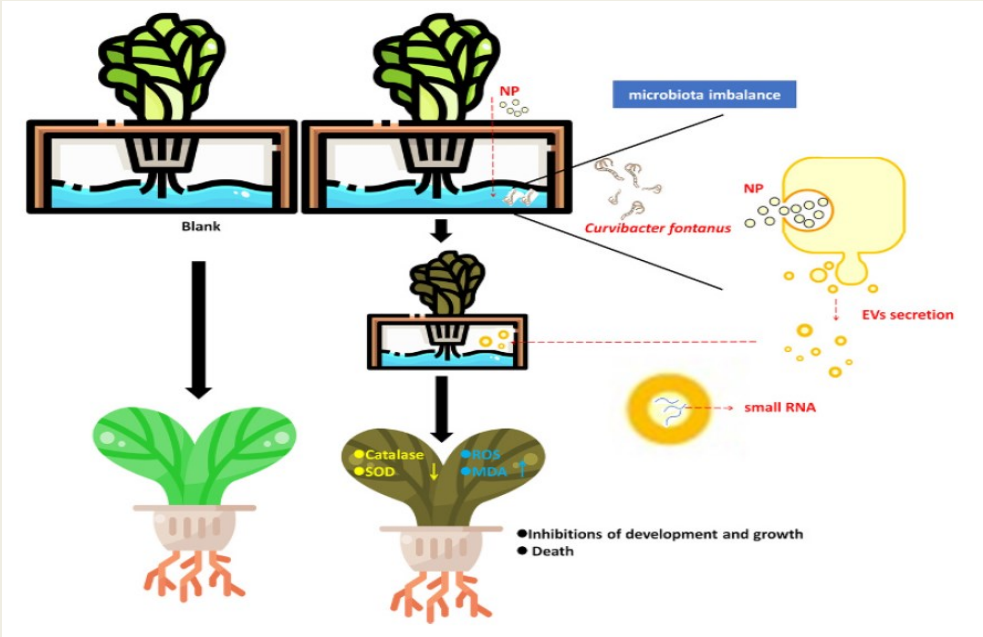
Name: Lee, Bao-Hong (Asst. Prof.)

Recent Research

- Adlay regulate composition of gut microbiota in a colonic fermentation model.
- Adlay promote the proportion of next-generation probiotics in the gut.
- Adlay help to maintain intestinal barrier function and gut health



- Nanoplastics significantly increased *Curvibacter fontanus* levels in irrigation water.
- *C. fontanus*-derived extracellular vesicles induced by NP exposure caused lettuce death.



Research Area: Horticultural Science
Research Specialization: Landscape Architecture Name: Lee, Ting-I (Asst. Prof.)

Recent Research

- Sustainable management for private healing landscape
- Policy and current development of community farms in Chiayi city
- Urban greenspace regeneration strategy - A case study of PARK 2.0 in Chiayi City
- Integrating cultural values in assessing the ecosystem services of urban street trees
- Woody floral elegance in Chinese gardens: A modern recreation inspired by the Dream of the Red Chamber

Keywords: urban street tree, urban alleyway, public park, allotments, ecosystem services, edible landscape, healing landscape, cultural landscape

Cultural landscape in Chiayi City