



SUMMARY REPORT

Preliminary Training Course on Tissue Culture: Case study of *Amorphophallus oncophyllus*

Prepared by

Asst. Prof. Dr. Phruet Racharak

Forest Biology, Kasetsart University



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Date

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1. Rationale

Amorphophallus, commonly known as konjac, is an economically valuable plant widely used in food and pharmaceutical industries. Due to increasing market demand and challenges in conventional propagation methods, tissue culture technology offers a promising alternative for mass production and genetic improvement of konjac.

This study is conducted under the broader ITTO project aimed at counteracting deforestation, forest degradation and enhancing sustainable livelihoods along the Thailand-Myanmar border. The influx of displaced populations due to political conflict has intensified forest exploitation, including illegal harvesting of non-timber forest products (NTFPs). The integration of tissue culture technology into local communities is expected to contribute to sustainable resource management, alternative income sources, and biodiversity conservation in the affected areas.

2. Objectives

1. Develop efficient tissue culture protocols for konjac propagation to enhance productivity and sustainability.
2. Establish a small-scale tissue culture laboratory for local training and capacity building.
3. Provide technical training to local stakeholders (farmers, community members, and local authorities) on tissue culture techniques.
4. Enhance economic opportunities for local communities through sustainable plant production and propagation.
5. Reduce pressure on natural forest resources by promoting domesticated cultivation of economically valuable plants.

4. Methodology

The tissue culture training program will be conducted using a combination of lectures, demonstrations and hands-on practical sessions to ensure participants gain comprehensive knowledge and skills. The methodology consists of the following key components as below.

4.1 Theoretical Knowledge Transfer

- Lecture Sessions: Covering fundamental principles of tissue culture, media preparation, sterilization techniques and plant propagation methods.
- Discussion and Q&A: Encouraging interactive learning through discussions and case studies relevant to tissue culture applications.

4.2 Practical Hands-on Training

- Preparation of Tissue Culture Media: Participants will learn how to formulate and prepare Murashige and Skoog (MS) media and other essential nutrient solutions.
- Sterilization Techniques: Training on proper sterilization of equipment, media and plant explants to prevent contamination.
- Sub-Culture and Transfer Techniques: Demonstrating methods for transferring plantlets to new culture media to promote growth.
- Transplanting and Acclimatization: Training on moving tissue-cultured plantlets from the lab to greenhouse or field conditions.

4.3 Capacity Building and Practical Implementation

- **Small-Scale Laboratory Setup:** Participants will learn how to establish and manage a basic tissue culture facility.
- **Field Application:** Practical demonstrations on transplanting techniques for sustainable commercial cultivation.
- **Group Discussions & Summary Sessions:** Facilitating knowledge exchange and feedback on program effectiveness.

5. Program

The training will be held in January - February 2025, with a total duration of 12 hours across two days. The program is designed for students, farmers, employees of agricultural enterprises, and other stakeholders in Mae Hong Son Province.

Day 1: Introduction and Media Preparation

08:30 - 09:00 **Registration**
 09:00 - 10:30 **Lecture:** Principles and preparation of tissue culture media
 10:30 - 10:45 Coffee break
 10:45 - 12:00 **Lecture:** Tissue culture media (cont.) and sterilization techniques
 12:00 - 13:00 Lunch
 13:00 - 15:00 **Practical session:** Preparation of tissue culture media
 15:00 - 15:15 Coffee break
 15:15 - 16:30 **Practical session:** Preparation of tissue culture media (cont.)

Day 2: Sub-Culture and Transplanting Techniques

08:30 - 09:30 **Lecture:** Sub-culture & transfer and transplanting techniques
 09:30 - 10:45 **Practical session:** Sterilization techniques
 10:45 - 11:00 Coffee break
 11:00 - 12:00 **Practical session:** Sterilization techniques (cont.)
 12:00 - 13:00 Lunch
 13:00 - 14:30 **Practical session:** Sub-culture & transfer
 14:30 - 14:45 Coffee break
 14:45 - 15:45 **Practical session:** Transplanting techniques
 15:45 - 16:30 Group discussion and summary

Note: The schedule is subject to adjustments based on participant needs and field conditions.

This program ensures that participants receive both theoretical knowledge and practical experience in plant tissue culture, equipping them with the necessary skills for sustainable agricultural practices and commercial plant propagation.

6. List of participants

Table 1 List of Participated Plant Tissue Culture Training, an alternative for increasing value Training

No.	Name	Affiliation	Position	Remark
1	Ms. Waankarn Saengsrirchan	Ban Tor Pae Community Forest	Community Forest Committee	
2	Ms. Aunruen Klahiran		Community Forest Committee	
3	Ms. Thitapha Rangsrirchan		Community Forest Committee	
4	Ms. Wichit Plianthondeang		Community Forest Committee	
5	Ms. Laeng Phanbut		Community Forest Committee	
6	Ms. Suphalak Suriya	Tor Pae Wittaya Community School	Teacher	
7	Master Phakhin Thongkham		Student	
8	Master Akdech Jai Nu		Student	
9	Miss Arisara (no surname)		Student	Holding an ID card for a person who is not a Thai national (a person from a highland area)
10	Master Thitichot Phanrit		Student	
11	Mr. Supachai Kwangthu	Pratu Muang Community Forest	Community Forest Committee	
12	Mr. Niyom Chailangka		Community Forest Committee	
13	Ms. Kotchakorn Prakongnit		Community Forest Committee	
14	Mr. Sombat Sriudomkarn		Community Forest Committee	
15	Ms. Wan (no last name)		Community Forest Committee	Holding an ID card for a person who is not a Thai national (a person from a highland area)
16	Mr. Worawet Kirimasaphudong	Lekoh Community Forest	Community Forest Committee	
17	Mr. Rapin Prapapiman		Community Forest Committee	
18	Ms. Narisara Hanpradit	Lekoh School	Teacher	
19	Ms. Suda Praiparak		Teacher	
20	Ms. Chuthathip Bunyuang	Thung Pham Community Forest	Community Forest Committee	
21	Ms. Kesorn Jommani		Community Forest Committee	
22	Ms. Buaphan Nokkaew		Community Forest Committee	
23	Ms. Khampan Sunantha		Community Forest Committee	
24	Ms. Jai Phutthasen		Community Forest Committee	
25	Ms. Supattra Duangdee	Ban Huai Sing School	Teacher	
26	Ms. Amporn Chengsa-ad		Teacher	
27	Miss Tawan Phanaleewiman		Student	
28	Master Nadech (no last name)		Student	Holding an ID card for a person who is not a Thai national (a person from a highland area)
29	Master Chanwit Ngamdeandao		Student	

7. Results, assessment results

The assessment result of this activity, overall, found that more than 70% was scoring this training as excellent while 20% evaluated it as good. And also the participants expressed their opinions on this activity such as 1) They gained new knowledge, which they could introduce to their younger siblings and friends, 2) We were able to integrate the knowledge into teaching causes and learning system in school. 3) They gained knowledge in experimentation, which they could apply in the future. 4) They gained knowledge that was in line with the intended purpose of their participation, and they were able to apply it to their careers and communities. They also provided suggestions for promoting appropriate areas in addition to this by organizing of the diverse topic, and they wanted to learn about other professions.

8. Sustainability

The sustainability of the Preliminary Tissue Culture Training Course Project is centered around capacity building, resource efficiency and long-term applicability for local communities. The following strategies will ensure the continued impact of the project:

8.1 Establishment of a Small-Scale Tissue Culture Laboratory

- The training program includes setting up a basic tissue culture facility in the community, ensuring that participants can continue propagation efforts beyond the training period.
- Essential laboratory equipment and materials will be provided, along with a guideline manual for ongoing operations.

8.2 Knowledge Transfer and Local Capacity Building

- The project aims to train trainers who can continue educating other farmers, students, and local entrepreneurs on tissue culture propagation.
- Collaboration with local institutions and agricultural cooperatives to ensure knowledge dissemination and sustained adoption of tissue culture techniques.

8.3 Economic and Environmental Impact

- By reducing reliance on wild plant harvesting, the project supports forest conservation and minimizes habitat destruction.
- The commercial potential of tissue-cultured konjac offers alternative income sources for local farmers, enhancing their financial resilience.
- Encouraging organic and sustainable farming practices to maintain soil health and biodiversity.

8.4 Monitoring and Continuous Improvement

- Regular assessments and follow-up sessions will be conducted to track participant progress and lab functionality.
- A feedback mechanism will be established for participants to share challenges and improvements, allowing for iterative learning and refinement of techniques.

8.5 Integration with Policy and Support Programs

- Seeking collaboration with government and non-government organizations to align with broader sustainable agriculture and forest conservation programs.
- Connecting local farmers to microfinance and agribusiness networks to support long-term commercial tissue culture ventures.

