



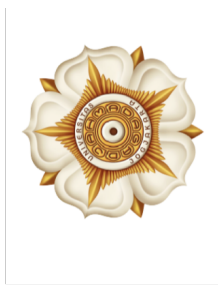
2nd BioAsia Mycodipt Workshop

**Role of mycorrhizal fungi in the natural regeneration,
sustainable management and biodiversity of Dipterocarp
forests in South-Est Asia**

Held at Villa Aromatica

Forest Research Institute of Malaysia (FRIM)

Kuala Lumpur, 13 & 15 October 2015



ANNOUNCEMENT

2nd BioAsia Mycodipt Workshop

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Introduction

A collaborative project involving researchers from the Forest Research and Development Agency (FORDA) of Palembang, Indonesia, the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (DIRAD), France, and the Forest Institute of Malaysia (FRIM), Malaysia, was undertaken between 2011 and 2014 and funded by Bio-Asia under the auspices of the Ministry of Foreign and European Affairs, France.

The project entitled “ Role of mycorrhizal fungi in the natural regeneration, sustainable management and biodiversity of Dipterocarps forests in South-Est Asia “, under the Mycodipt acronym, was conducted with the aim of strengthening scientific collaboration between South-East Asian and French institutions that share similar scientific, educational and development policies through interdisciplinary approaches combining basic and applied research.

The general objectives of this collaborative project are: i) to generate basic knowledge on the diversity, interactions and role of plant-microbe symbioses in the processes of colonization and succession of plant species in natural and disturbed ecosystems, and ii) from this knowledge, to provide new tools and technical methods using microbial symbioses in enrichment programs for reforestation of exploited forests.

Objectives

This workshop has two main objectives where invited speakers will: i) share the results obtained from this project, and ii) share information on the ecology and diversity of dipterocarps and their fungal symbionts, including their threat status, in particular in Malaysia and Indonesia. Workshop participants, including researchers, magister and doctoral students will come from FRIM, UPM (University of Putra Malaysia), FORDA and UGM (Forestry Faculty, University of Gadjah Madah, Yogyakarta, Indonesia).

Scientific Program

Program of Day 1 (Tuesday, October 13)

Venue : Villa Aromatica

Time	Schedule	Speakers
08.30 - 09.00	Registration	Committee
09.00 - 09.15	Organizing committee	Committee
09.15 - 09.30	Welcome and opening ceremony	Dr. Alain RIVAL (CIRAD representative for Insular South-East Asia)
09.30 - 09.45	Interval (tea break)	
09.45 - 10.15	Importance of Dipterocarps in the Malaysian and International wood market	Dr. Jean-Marc RODA (CIRAD, Malaysia)
10.15 - 10.45	Progress in Dipterocarp ectomycorrhizal research	Dr. Su See LEE (FRIM, Malaysia)
10.45 - 11.15	Role of mycorrhizal fungi in the natural regeneration, sustainable management and biodiversity of Dipterocarps forests in South-Est Asia - Contribution of the BioAsia Mycodipt project	Dr. Antoine GALIANA (CIRAD, France)
11.15 - 11.45	Mycorrhizal plant facilitation : a promising key tool for nickel mine site ecological restoration in Madagascar and New Caledonia	Dr. Marc DUCOUSSO (CIRAD, France)
11.45 - 12.15	Diversity of ectomycorrhizas in lowland and mountain forests of south Sumatra	Maliyana ULFA (FORDA/UGM, Indonesia)
12.15 - 12.45	Afforestation of ex-tin mines with Dipterocarps on other tree species in Malaysia	Dr. Lai Hoe ANG (FRIM, Malaysia)
12.45 - 14.00	Interval (lunch and break time)	
14.00 - 14.30	Rehabilitation of BRIS soil using mixed plantations of Acacia-Dipterocarp species	Patahayah MANSOR (FRIM, Malaysia)
14.30 - 15.00	Identification of large litter-colonizing-fungi within a dipterocarp forest and their relation with the hypothesis of ectomycorrhizal niche differentiation	Rimbun CHAIDIR (UPM, Malaysia)

15.00 - 15.30	Host specificity of ectomycorrhizal fungi of three Dipterocarp species	Mohd SALLEH SANUSI (FRIM, Malaysia)
15.30- 16.30	Engaging the participation of the public and institutions for the conservation of Dipterocarpaceae	Pr., Dr. Jean WEBER (UPM, Malaysia)

Program of Day 2 (Thursday, October 15)

Field trip

07.30	Departure from FRIM for Tin Tailing Afforestation Center (TTAC), Bidor (Perak)	Committee
10.00	Arrival at TTAC	
10.15	Briefing on TTAC by the manager, Dr. Lai Hoe Ang	
10.30	Site Visit : - Site 1 : mixed Acacia mangium-Dipterocarps Plot (EU Project) - Site 2 : Multi-species plot	
12.30	Lunch	
14.00	Departure for FRIM	
16.30	Arrival at FRIM and hotel	

ABSTRACTS

2nd BioAsia Mycodipt Workshop

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Role of mycorrhizal fungi in the natural regeneration, sustainable management and biodiversity of Dipterocarps forests in South-Est Asia - Contribution of the BioAsia Mycodipt project

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Abstract

The overexploitation of forests in South-East Asia and their replacement by industrial plantations led to their progressive disappearance in lowland and mountain areas in the last decades. Consequently, policies of forest preservation and the implementation of restoration programs have become priorities in view of sustainable production of timber and soil conservation. However, forest regeneration is highly dependent on the presence of their mycorrhizal symbiotic partners in soils. In the framework of the Mycodipt-BioAsia research project funded by the French Ministry of Foreign and European Affairs in a tripartite partnership between FORDA, FRIM and CIRAD, the first objective of our work was to describe the diversity of ectomycorrhizal trees and that of their associated fungi in two natural forests in South-Sumatra.

The Sungai Telang forest site (Muara Bongo District, 01.69635° S; 101.78889° E; alt. 300 m), was chosen as a typical lowland forest dominated by Dipterocarps. The second site, Rimbo Candi (Pagar Alam District, 04.16563° S; 103.19810° E; alt. 1450 m), was chosen as a typical mountain forest dominated by Myrtaceae and Fagaceae species. Systematic forest surveys were performed along appropriate transects in both sites. All the ectomycorrhizal tree species and their individuals observed were identified according to botanical traits. In addition, sapwood samples were collected for further molecular characterization of the different tree species by partial sequencing of the intron region of chloroplast *trnL* gene (*trnL*). Fruit bodies of ectomycorrhizal fungi found in these experimental plots were collected and identified based on morphological traits. In parallel, ectomycorrhizal root tips were collected at the basis of each tree for further molecular characterization of the fungal partner through partial sequencing of rDNA in the ITS region, and that of the associated host plant species through *trnL* sequencing.

A high diversity of ectomycorrhizal tree species was found in both forest types. Twelve different species, mostly *Shorea* spp. were identified from the 2 ha plot in Sungai Telang Dipterocarp forest. The Rimbo Candi mountain forest was dominated by trees of the Myrtaceae, Fagaceae and Lauraceae families represented by species of *Zyzygium*, *Lithocarpus* and *Cinnamomum* respectively. A low diversity of ectomycorrhizal fungi fruiting bodies were observed in lowland Dipterocarp forest contrary to the mountain forest site. The molecular analyzes showed that the mycorrhizal roots of the Dipterocarp forest were predominantly colonized by Thelephoraceae (*Tomentella* and *Thelephora* spp.) and *Russula* spp. although a high diversity of other fungal genera was found.

The understanding of mycorrhizal diversity and its exploitation in the frame of reduced-impact logging strategies is a key element to be considered for sustainable forest management and soil conservation in Southeast Asia.