A Preliminary Study on the Diversity of Macrofungi in Nong-rawieng Plant Genetics Forest

Sureelak Rodtong[1], Neung Teaumroong[2], and Pinit Chooklay[3]

[1]School of Microbiology, Institute of Science, Suranaree University of Technology, Nakhon Ratchasima 30000, [2]School of Biotechnology, Institute of Agricultural Technology, Suranaree University of Technology, Nakhon Ratchasima 30000, and [3]Rajamangala Institute of Technology, Northeastern Campus, Nakhon Ratchasima 30000, Thailand

Abstract

General surveys of macrofungi were carried out in Nong-rawieng Plant Genetics Forest (dry dipterocarp and mixed deciduous forests), Nakhon Ratchasima, Thailand. The genera *Boletus*, *Cantharellus*, *Ganoderma*, *Hypoxylon*, *Lactarius*, *Lycoperdon*, *Macrolepiota*, *Marasmius*, *Mycena*, *Pisolithus*, *Russula*, *Schizophyllum*, *Termitomyces*, and *Xylaria* were mainly found. The fungal species diversity was also found. This preliminary study revealed a high diversity of macrofungi in Nong-rawieng Plant Genetics Forest. Studies supported by the Plant Genetics Conservation Project as the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn are continuing to assess the diversity and density of fungi occurring in this forest.

Introduction

The Nong-rawieng Plant Genetics Forest is a natural forest existing in Amphur Muang, Nakhon Ratchasima Province, Thailand. It is composed of two forest types, dry dipterocarp and mixed deciduous (*Acacia comosa*, *Erythrophleum*, and *Lannea* dominated) forests, and situated in the Field-Training Centre of Rajamangala Institute of Technology, Northeastern Campus, which has a total area of 400 hectares. The forest has been preserved by the Plant Genetics Conservation Project as the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn since 1994. The study on the diversity and density of fungal species as well as plant and animal species occupying the plant genetics forest has been suggested in order to create their genetics database system. With our fundamental knowledge of mycology, we proposed to investigate mushrooms and other macrofungi occurring in this forest. A preliminary study on the fungal diversity was carried out, and presented in this paper.

Materials and Methods

General surveys of the Nong-rawieng Plant Genetics Forest area were made to collect as many macrofungal species as possible. Specimen collections were carried out as described by Arora (1986) and Bandoni *et al.* (1996). Field notes

were taken. Fungal macroscopic characteristics were observed. Spore prints were examined from fleshy mushrooms. The spore-bearing structure was sectioned by hand using a single edged razor blade, then mounted in water or in lactophenol-cotton blue, and proceeded to microscopic examination. Some specimens were prepared as herbarium material by drying at 45°C. An attempt was made to identify the specimens using the available literature listed in the reference section.

Results

Surveys of macrofungi were made between January and September 1997. Fourteen genera of macrofungi (Table 1) were mainly found in this preliminary study. There was no fungal record in May and June because the large part of this forest area was on fire around April. An *Amanita* species having gray cap color with gray patches and *Lepiota (cristata?)*, a poisonous mushroom, were also found in the mixed deciduous forest area in September. The largest specimen collection was in September (late in the rainy season). In this rainy season, heavy rain induced the first crop of macrofungi in Nong-rawieng Plant Genetics Forest particularly with *Cantharellus, Lactarius, Marasmius, Mycena, and Russula*, and passed on to *Boletus, Lycoperdon, Macrolepiota, Pisolithus*, and *Termitomyces*.

Several specimens which could not be identified and are not be mentioned in this paper were found in the preliminary study as well. However, surveys of fungi are being carried on both in general and in quadrats to assess the diversity and density of these fungi in the forest area. The studies will also be very helpful for completion of the identification and confirmation of the presence of macrofungi.

Conclusion

Fourteen genera of macrofungi were mainly found in the preliminary study on their diversity in Nong-rawieng Plant Genetics Forest. These genera were *Boletus, Cantharellus, Ganoderma, Hypoxylon, Lactarius, Lycoperdon, Macrolepiota, Marasmius, Mycena, Pisolithus, Russula, Schizophyllum, Termitomyces*, and *Xylaria*. The species diversity of these fungi, especially genera *Cantharellus, Marasmius, Russula*, and *Termitomyces*, was also found. The identification of some fungi found into species needs to be carried on and verified.

Acknowledgements

This work was supported by the Plant Genetics Conservation Project as the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn. We would like to thank Suranaree University of Technology for research facilities.

Table 1. Genera of macrofungi mainly found in Nong-rawieng Plant Genetics Forest in 1997.

Genus	Brief description and distribution of the species found*
Boletus	The species with yellow-brown cap as were the pores, 5-7 cm cap diameter, dull yellow stalk (0.8-1x7-10 cm), and elliptical spores was found in the dry dipterocarp forest in September.
Cantharellus	This genus was found to be widespread and occurred in large numbers in both dry dipterocarp and mixed deciduous forests in August and September. The largest single collection was from the dry dipterocarp forest in August. Species found were *Cantharellus cibarius* and *Cantharellus* (*minor*?).
Ganoderma	A species with fan-shaped cap and 3-4x2-3 cm stalk was found in a low population density of fruiting bodies in the mixed deciduous forest area both in August and in September.
Hypoxylon	The species with flattened, multiperitheciate stromata and papillate ostiola was found in the dry dipterocarp forest in March.
Lactarius	*Lactarius piperatus* was found in the dry dipterocarp forest both in August and in September.
Lycoperdon	The oval shaped fruiting body (2-4 cm diameter) with white to tan outer skin and the pear-shaped fruiting body (1-2.5 cm diameter) with white outer skin were found in large numbers in the mixed deciduous forest area in September.
Macrolepiota	The species that had its macroscopic and microscopic characteristics as *Macrolepiota gracilenta* was found in several spots in the mixed deciduous forest area in September.
Marasmius	This genus was widespread and occurred in large numbers in both dry dipterocarp and mixed deciduous forests. At least three different fruiting body appearances were found in August and September.
Mycena	The genus was found in both dry dipterocarp and mixed deciduous forests in August and September.
Pisolithus	*Pisolithus tinctorius* occurred along the roadside (temporary road) in the study area in September.
Russula	The genus was widespread with a high population density of fruiting bodies in both dry dipterocarp and mixed deciduous forests in August and September. The largest single collection was from the dry dipterocarp forest in August. At least three species, *Russula emetica*, *R. rosacea*, and *R.* (*delica*?), could be identified from specimen collections.

*Color figures of some macrofungi are presented at the conference.

Table 1. (continued)

Genus	Brief description and distribution of the species found*
Schizophyllum	*Schizophyllum commune* was found in both dry dipterocarp and mixed deciduous forests in January and September.
Termitomyces	Three species, *Termitomyces microcarpus*, *T. striatus*, and *T. (tyleranus?)*, were found in the mixed deciduous forest area in September. *Termitomyces microcarpus* and *T. striatus* occurred in large numbers.
Xylaria	The anamorph covering the upper part of an immature teleomorphic stroma was found at several spots in the dry dipterocarp forest both in August and in September.

*Color figures of some macrofungi are presented at the conference.

References

Alexopoulos, C. J., C. W. Mims, and M. Blackwell. 1996. *Introductory Mycology.* New York: John Wiley & Sons Inc.

Arora, D. 1986. *Mushrooms Demystified: A Comprehensive Guide to the Fleshy Fungi.* Second edition. Berkeley: Ten Speed Press.

Bandoni, A. A., R. J. Bandoni, and T.W. Flegel. 1996. *Preliminary Pictoral and Synoptic Keys to Thai Fungi.* Bangkok: Mahidol University.

Corner, E. J. H. 1994. *Agarics in Malesia: I Tricholomatoid II Mycenoid.* Berlin: Strauss Offsetdruck Gmbh.

Phillips, R. 1991. *Mushrooms of North America.* Boston: Little, Brown and Company.

Royal Institute. 1996. *Edible and Poisonous Mushrooms in Thailand.* Bangkok: Royal Institute. (in Thai).

Watling, R. 1995. *Children and Toxic Fungi: The essential Medical Guide to Fungal Poisoning in Children.* Edinburgh: The Royal Botanic Garden Edinburgh.