

Wild Mushroom Database of Chiang Mai Community Forest

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(Received for publication: 20 December 2005)

Abstract

The diversity of macrofungi at Chiang Mai community forests and Doi Suthep-Pui National Park was investigated during October 1996 – November 1998 and November 2003 – October 2004. Fungi were collected from 19 forest areas and identified. Two hundred and fifty eight species were found. They were ascomycetes of 30 species, 21 genera, 12 families, 5 orders, and basidiomycetes of 228 species, 89 genera, 35 families, 10 orders. The most prominent species of macrofungi found belonged to the families *Boletaceae*, *Agaricaceae* and *Russulaceae* comprising 43, 35 and 28 species respectively. A wild mushrooms database including its management program, Wild Mushroom Database Version 1.0, was developed by using the data related to the habitats and macroscopic and microscopic characteristics of wild mushrooms. This software will be used for managing the dried wild mushroom specimens in the Mushroom Herbarium, Biology Department, Faculty of Science, Chiang Mai University, Thailand.

Keywords: *Chiang Mai, community forest, database, wild mushrooms*

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Introduction

In Thailand, wild mushrooms are common only in the rainy season from June to October. All of the wild mushroom species are collected from community forests where they form symbiotic associations (ectomycorrhizae) and fruiting bodies with indigenous tree families, *Dipterocarpaceae*, *Fagaceae*, *Pinaceae* and *Ulmaceae*, in the region

(Sanmee *et al.* 2003). They are collected by local people in remnant secondary stands of hillside forests and sold on the roadside at local, and at city markets. Although edible wild mushrooms were sold at higher prices than cultivated ones, Thai people prefer to consume them due to their flavour and texture (Sanmee *et al.* 2003).

Some poisonous wild mushrooms are almost

indistinguishable from edible species, so that the rate of illness and death from consuming the poisonous wild mushrooms increase every year (Bureau of Epidemiology, Department of Disease Control 2003) There are numerous well-known monographs on edible and poisonous species from Europe, North America and tropical Africa (Bas 1969, Jenkins 1986), but they provided little information for Thailand. So, most of the local people know very little about poisonous wild mushrooms, and some people willingly destroy them at once, which caused lacking of information and obstructed their distribution in nature.

The aims of this research were:

1. To investigate the diversity of wild mushrooms in Chiang Mai community forests and Doi Suthep-Pui National Park.
2. To create a wild mushroom database and its management software for using it as a

reference in the local area and as a sources of knowledge on edible and poisonous mushrooms for students and interested people.

Materials and Methods

Nineteen forest areas in 5 community forests (San Kampheng, Mae Wang, Mae Rim, Mae Orn, and Doi Saket districts, Figure 1) and 14 forest areas in Doi Suthep-Pui National Park were surveyed from November 2003 to August 2004 and October 1996 to November 1998, respectively.

Wild mushroom collectors who were experienced in collecting wild mushrooms in each study site were invited to have an interview and answer questionnaires, both of which were served to find out the number of wild mushroom species in each study site, and how the mushrooms were utilised by the local people.

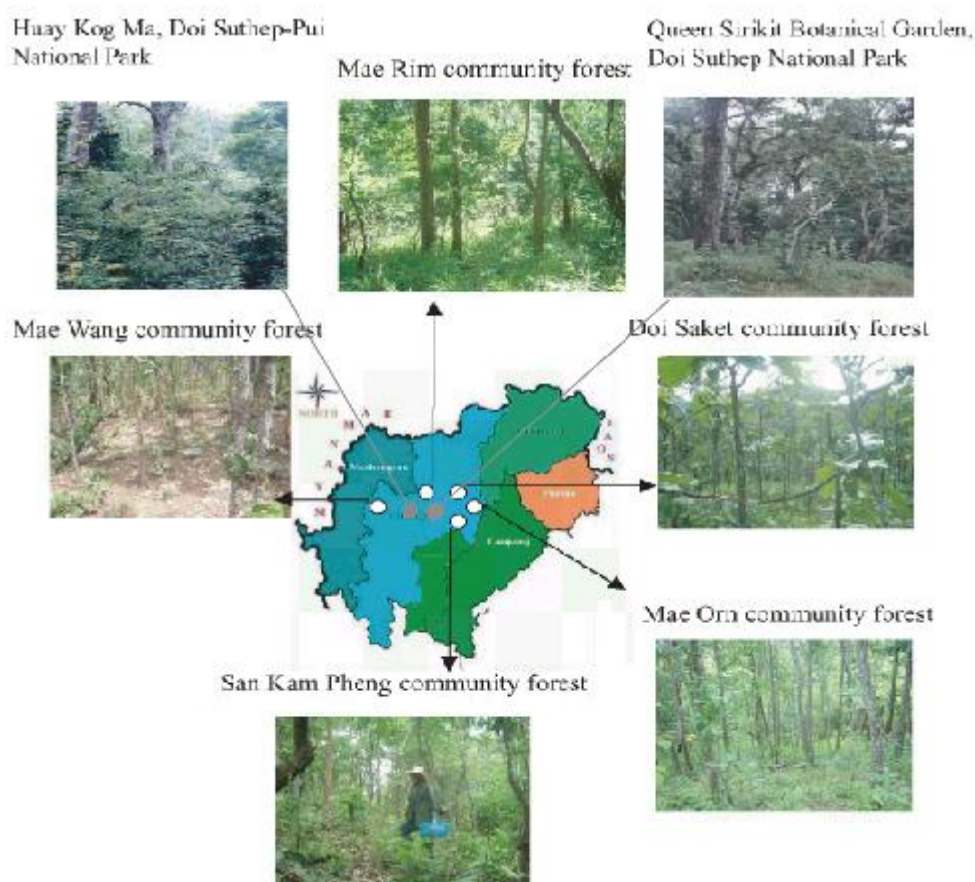


Figure 1 Chiang Mai community forests

Diversity of wild mushrooms in Chiang Mai community forests and Doi Suthep-Pui National Park in Chiang Mai, Thailand

Chiang Mai community forests and Doi Suthep–Pui National Park were selected as study areas according to the types of forest (mixed deciduous, dry dipterocarp, moist evergreen, hill evergreen, and dry evergreen/pine forest) and the sites recommended by the experienced mushroom collectors in each community. Each study site was investigated at least three times per month. Mature fruiting bodies of mushrooms were collected. The following information was recorded, *i.e.*, species names of mushrooms found in each site, macroscopic and microscopic characteristics of fruiting body of each species, collected date, substratum, habitat, relative air humidity, soil moisture, air temperature, altitude, location, soil pH and light intensity at the ground level (Pegler 1998). The collected specimens were identified

and the classified by conventional morphological methods (Singer 1986).

Wild mushrooms database of Chiang Mai community forests and Doi Suthep-Pui National Park

The recorded information of the diversity of wild mushrooms in Chiang Mai community forests and Doi Suthep–Pui National Park mentioned above for each species, such as the data related to its species, habitat, macroscopic and microscopic characteristics of fruiting body, was used to create the relational database (Figure 2 and 3) by using database management software, such as Microsoft Access, Microsoft Visual Foxpro and Microsoft SQL. The database management system program was developed and the end-user interface was designed by using Microsoft Visual Basic (Figure 3).

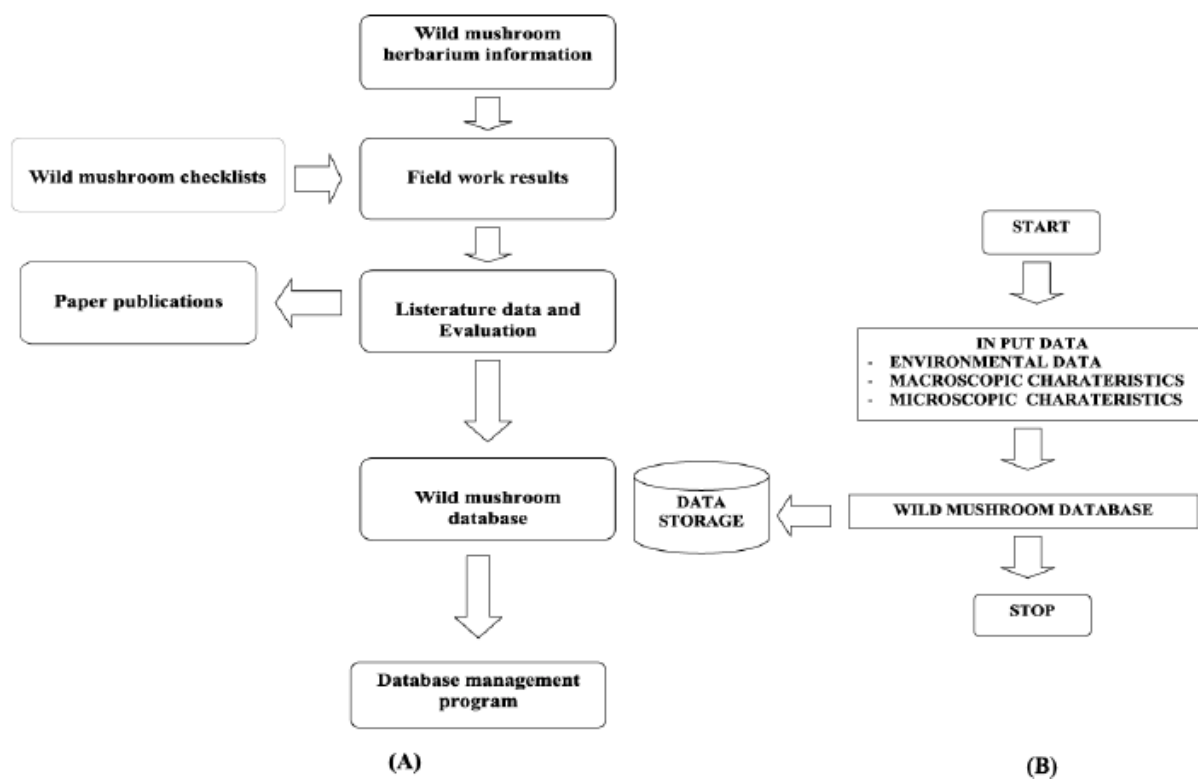
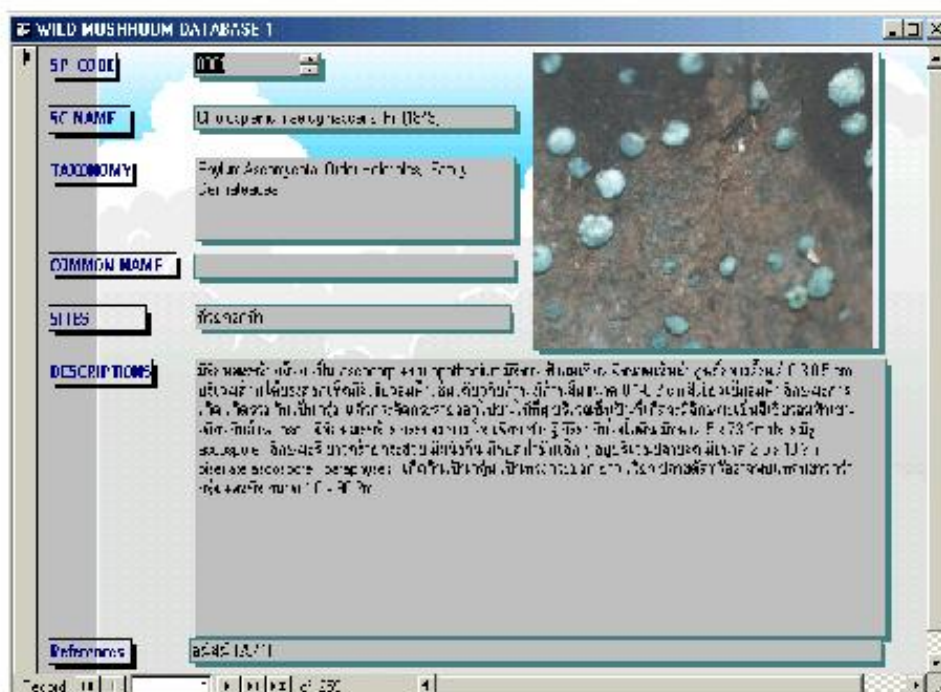
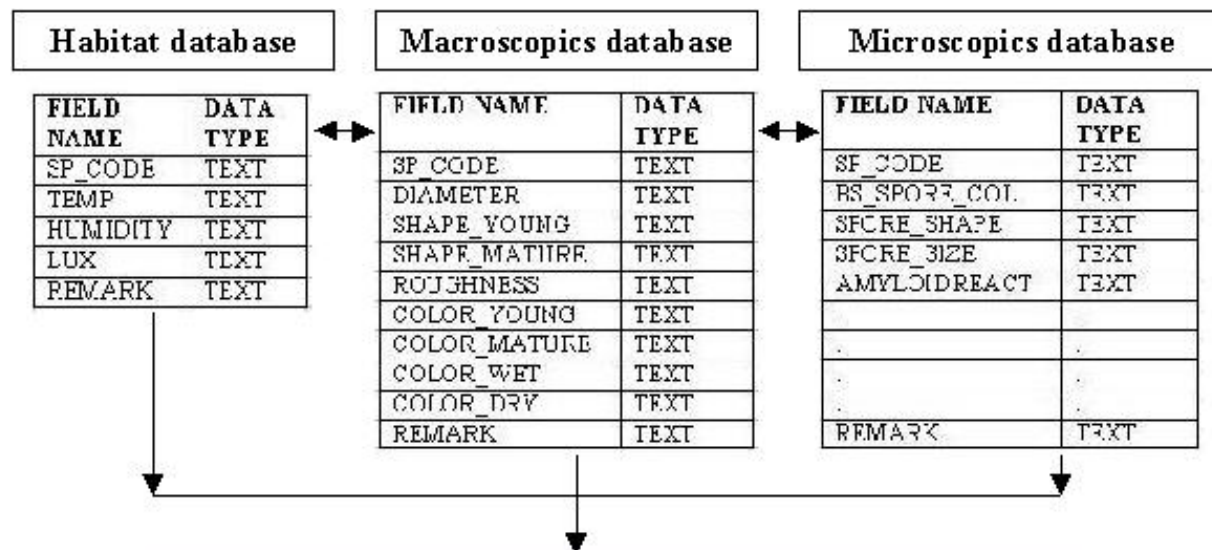


Figure 2 (A) A simple schema of information flow in the on-line wild mushroom database of Chiang Mai community forests; (B) A flowchart showing the procedure for input a mushroom data into wild mushroom database.



(Data input form)

Figure 3 Relationship-diagram of relational data field (SP_CODE, in each database) for linking to raw data of wild mushroom database and the data input form for inputting raw data into the wild mushroom database.

Results and Discussion

Table 1 shows common edible wild mushroom species in each local community forest which were served as food, and some others which were used to decorate the wood handicraft for home decoration.

The information obtained by questionnaires showed that most of the people who were interviewed were the members of community forests. They played an important role in forestry conservation. The forest served them with food resources (bamboo shoot, edible wild mushrooms

and herbs) for daily survival. Most of them knew edible, non-edible and poisonous mushroom species up to 40, 8 and 10, respectively. The local mushroom collectors avoided from collecting the poisonous species. They learnt these poisonous ones from their parents or from experienced senior

neighbors. However, there are some reports in each year that people get sick or die by consuming the poisonous species. These people mistakenly collected the poisonous mushrooms since they look similar to the edible ones.

Table 1 Prices of common edible and non-edible wild mushrooms in Chiang Mai community forests during June to September 2004

Scientific name	Local name	Prices(baht)		Yield / kg/ day	Utilization
		Local wholesaler	Local market		
1. common edible mushroom					
<i>Astraeus hygrometrius</i>	Hed Throp	20-60	100-150	10-20	Curry, soup and canning
<i>Russula virescens</i>	Hed Lorm (mature)	30-40	80-100	10	Curry, Nam Pic
<i>Russula virescens</i>	Hed Lorm (young)	40-80	120-200	10	Curry
<i>Russula xerampelina</i>	Hed Dang Luang	40-60	60-100	6	Curry
<i>Phaeogyroporus portentosus</i>	Hed Har	40-80	60-100	4	Curry
<i>Russula cyanoxantha</i>	Hed Nar Moi	30-40	50-100	6	Curry
<i>Russula nigricans</i>	Hed Than Yai	30-40	50-100	3	Curry
<i>Russula densifolia</i>	Hed Than Lek	30-40	50-100	3	Curry
<i>Termitomyces</i> sp.	Hed Korn	40-100	100-240	1	Curry
<i>Lactarius volemus</i> Fr.	Hed Farn	20-40	60-80	2	Curry
<i>Craterellus aureus</i>	Hed Kamin Luang	30-40	50-80	2	Curry
<i>Clitocybe</i> sp.	Hed Chang Phi	30-40	50-80	5	Curry
<i>Craterellus odoratus</i>	Hed Kamin lak	30-40	60-80	1	Curry
<i>Heimiella</i> sp.	Hed Pod Ma	40-60	60-100	2	Curry
<i>Lactarius glaucescens</i>	Hed Khar	20-40	40-60	2	Curry
<i>Russula alboareolata</i>	Hed Nam Paeng	30-40	60-100	4	Curry
<i>Amanita princeps</i>	Hed Kai Kao	60-80	80-150	2	Curry
<i>Amanita hemibapha</i>	Hed Kai Leang	60-80	80-150	2	Curry
2. non-edible wild mushroom					
<i>Amauroderma</i> sp.	Hed Pak, Hed Ja Vak	100-200	-	1-2	Home decoration
<i>Ganoderma</i> sp.	Hed Kra dang	100-200	-	1-2	Home decoration

Diversity of wild mushroom in Chiang Mai community forests and Doi Suthep – Pui National Park

Fifty-eight species of wild mushrooms were found and commonly known in the collected areas of Chiang Mai community forest during November 2003 to October 2004. The most prominent species of macrofungi found belonged to the families Agaricaceae and Russulaceae comprising 8 and 12 species respectively. In Doi Suthep-Pui National Park, there were 258 species of wild mushrooms found during October 1996 to November 1998. The most prominent species of macrofungi found belonged to the families Boletaceae, Agaricaceae and Russulaceae

comprising 43, 35 and 28 species, respectively. All of them were the members of the basidiomycetous group.

The common species were *Amanita hemibapha*, *Amanita princeps*, *Astrareus hygrometrius*, *Craterellus aureus*, *Craterellus odoratus*, *Heimiella* sp., *Lactarius glaucescens*, *Lactarius* sp., *Phaeogyroporus portentosus*, *Russula alboareolata*, *Russula cyanoxantha*, *Russula densifolia*, *Russula nigricans*, *Russula virescens*, *Russula xerampelina*, and *Termitomyces* sp.

In Doi Suthep-Pui National Park, wild mushrooms were found in mixed deciduous forest

(76%), dipterocarp forest (25%) and dry evergreen/pine forest (12%). While for Chiang Mai community forests, most (86%) of wild mushrooms were found in the mixed deciduous or dry dipterocarp forest.

Wild mushrooms database of Chiang Mai community forests and Doi Suthep-Pui National Park

The wild mushrooms database (Figure 3) was created by combing the data on habitat and macroscopic and microscopic characteristics of each mushroom from the field study on the diversity of wild mushrooms in Chiang Mai community forests and Doi Suthep-Pui National Park. After inputting the raw data of each mushroom into the disk storage, a database management program was developed for managing the dried wild mushrooms in the mushroom herbarium. At present, this database has more than three hundred records of wild mushrooms: 58 records in Chiang Mai community forests and 258 records in Doi Suthep-Pui National Park.

As mentioned above, in Thailand, the information related wild mushrooms is insufficient and most of the local people know very little about the poisonous wild mushrooms so that the outputs from this research, such as the wild mushroom database software and reference book, will be distributed to the knowledge-based learning centers, schools and local libraries for preventing the local people from consuming the poisonous wild mushrooms. For the further work, we have a plan to set a training program related to wild

mushroom conservation for Thai people.

Acknowledgement

We thank the local wild mushroom collectors in Sankampheng, Mae Wang, Mae Rim, Mae Orn, Doi Saket and Doi Suthep-Pui National Park for helping us to collect wild mushrooms in each community forest.

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