Mushroom Utilization by the Iban in Eastern Sarawak, Malaysia

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Introduction

Fruiting bodies of macrofungi (mushrooms, stinkhorns, bracket fungi etc) are used not only as food products but also for traditional uses (Spooner and Roberts 2005). It is well known that the dried tissue of one of the bracket fungi, *Fomes fomentarius*, is used as tinder in Europe. In northern parts of America and Europe, other traditional uses of fungi are also seen, such as dyeing, razor stops and perfume. Not only in boreal and temperate zones, but also in the tropics, local people eat wild mushrooms, as seen in reports from, for example, Guyana (Henkel et al. 2004), Mexico (Jarvis et al. 2004; Ruán-Soto et al. 2006), Venezuela (Zent et al. 2004), Cameroon (van Dijk et al. 2003), Ethiopia (Tuno 2001), Zaire (Courtecuisse 1993), Thailand (Desjardin et al. 2004) and Malaysia (Anderson et al. 2003), and also use them for other purposes, such as medicine (Zent et al. 2004).

The local peoples of Borneo have a tradition of utilizing forest products. Christensen (2002) reported that the Iban, the most populous ethnic group in Sarawak, use and give names to 17 species of fungi. Because more than 100 aphyllophoralian species (bracket and shelf fungi, not including agaric mushrooms) are found in our study area, Lambir, Sarawak (Yamashita unpublished data), the large part of fungal use by Iban people is still uncovered. In this study site, Iban villagers cut and burn secondary forests to establish rice fields, and leave the fields for fallow or plant para rubber seedlings on the fields after 1 or 2 years of rice cultivation (Ichikawa 2004). The fungal community structure differs according to type of land use (Yamashita et al. 2007), thus I expected that there would also be differences in the importance of a forest type from the view of fungal use. In this study, I aimed to reveal the recognition and utilization patterns for macrofungi by Iban people.

Methods

From 27 December 2005 to 13 January 2006, I sought fruiting bodies of macrofungi in 29 forest stands within 30 km of Rumah Chabu, Lambir, Sarawak for about 3 hours daily, working with an informant. The informant was an Iban local villager, a man who was about 60-years old and lived in Rumah Chabu. Because he knew much about plants in this region, I expected that he would have substantial information about macrofungi. Study stands included fallows, an oil palm plantations, rubber plantations, isolated primary forest, and primary forest. In addition, we collected all the conspicuously large macrofungi at the roadside or rice field. When we collected each fruiting body, I asked him in Malayan to tell me the Iban name and how it was used. After that, I confirmed the spelling with four Iban villagers who understood English. The fruiting bodies collected were identified to determine the species and preserved as dried specimens.

Results and Discussion

Local knowledge and utilization

A total of 171 fungal fruiting bodies of 49 Iban species were collected (Table 1). Twenty-five species are used as food. Kulat gelang (*Lentinus sajor-caju*) seems to be popular and Kulat sawit (*Volvariella* sp.) is sold in Miri city. Kulat kerang (*Schyzophyllum commune*), which forms rather tough fruiting body, is widely distributed around the world, and some other local ethnic groups, such as the Majangir in Ethiopia, also eat this fungi (Tuno 2001). Furthermore, 10 Iban species were used for purposes other than food. Seven Iban species of bracket fungi, e.g. Kulat batang, Kulat Rajang, Kulat kering and so on (*Earliella scabrosa*, *Ganoderma australe*, *Trametes elegans* and so on) were used as mosquito repellents by putting the fruiting bodies in flames and fumigating. A red-coloured shelf fungi named Kulat dunggul manuk (*Pycnoporus sanguineus*, *Stereum ostrea*), a stinkhorn named Kulat butuh apaisali (*Dictyophora* sp.), and Kulat tusu kamba (*Xylaria* sp.1) are used as medicine for sick fowl by soaking the fruiting bodies in water and letting the fowl drink the water. Some coral fungi, Kulat punas (not identified), are used as medicine to increase fertility by rubbing the fruiting bodies into the lower abdomen. However, nowadays Iban people in the study area normally use fungal fruiting bodies only as food.

Latin names and Iban names

Thirty-nine Latin species were recognized, although the informant named 49 Iban species. This does not mean that Iban people recognize fungal fruiting bodies in detail, because some Iban species obviously include many Latin species. For example, Kulat ipuh contains *Coprinus* sp., Boletaceae, and other agaric fungi. The informant gave the Iban name “Kulat ipuh” to mushrooms that he does not know or eat.

Among 18 Iban species that were observed more than 3 times, 6 Iban species corresponded to one Latin species and rest of them include a number of Latin species. In addition, one Latin species did not always correspond to a single Iban species. For example, Kulat batang includes 11 Latin species. One of these 11 Latin species, *Earliella scabrosa*, was named as Kulat batang, Kulat kering and Kulat rajang. It is not a surprise that Iban people lump many Latin species of bracket fungi into one Iban species, because microscopic traits are very important in order to identify most of the above-mentioned bracket fungi to the Latin species level. On the other hand, *Cookeina* spp. was always named as Kulat mangkok, *Xylaria* sp.2 as Kulat tusu babi, and *Lentinus sajor-caju* as Kulat gelang. The shapes of fruiting bodies of *Cookeina* spp. and *Xylaria* sp.2 were conspicuously different from other fungi. For example, *Cookeina* spp. is named as Kulat mangkok, which means cup-shaped mushroom. In addition, more than 40% of Iban names were based on traits and similes of morphological traits of fungal fruiting bodies. *Lentinus sajor-caju* seems to be one of the most popular fungal foods. These points suggest that recognition of fungal fruiting bodies by Iban people is based on morphological character, and that fungal fruiting bodies which are not important species are grouped into complexes such as Kulat ipuh, Kulat batang and so on.

Effect of land use types on edible and other utilized fungi

The average number of edible fungal species increased with decreasing human activities, although the number in oil palm plantations was higher than the number in isolated primary forest (Fig. 1). The number of Iban species of fruiting bodies with traditional uses was high in isolated primary forest and primary forest,

which seemed to reflect the spatial distribution pattern of bracket fungi among forest types (Yamashita et al. 2007).

An oil palm plantation provided economically valuable fungi, Kulat sawit (*Volvariella* sp.). However, other forest types did not always provide economically valuable fungi. We did collect some edible and economically valuable fungi from many forest types, but without a regular pattern emerging. In addition, the informant said that the Iban do not go into forest only to get mushrooms because it is very difficult to know when and where they appear. This indicates that no specific forest type is particularly valuable from the perspective of production of fungal fruiting bodies.

Further implications

Compared to other tropical areas, the study area is characterized by the lack of a dry season. It is well known that the appearance of fungal fruiting bodies is stimulated by rainfall (Yamashita and Hijii 2004). Thus, the lack of a dry season makes it hard to predict when and where fungal fruiting bodies will appear. Tuno (2001) also pointed out the importance of predictability of fungal appearance by stating that the Majangir in Ethiopia also collect their favorite fruiting bodies when they come across them, because of absence of clear seasonality. It is possible that low predictability in the appearance of mushrooms affects the Iban culture of fungal utilization.

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Table 1 List of collected mushrooms and other fungi

Iban name	Frequency	Food	Use	Meaning of Iban name
Kulat ampuh bah	7	7	-	ampu(o)h, flood; bah, come on or
Kulat batang	15	-	10	a log
Kulat batang merah	1	-	1	batang, a log; merah, red
Kulat batang repuk	1	1	-	batang, a log; repuk, bad
Kulat bulu	5	5	-	hairy, feather
Kulat burak	7	7	-	white
Kulat butuh apaisali	1	-	1	butuh, penis; Apai Sali, Father of Stupidity
Kulat dunggul manuk	3	-	2	dunggul, a cock's comb; manu(o)k, chicken
Kulat gam	3	-	-	molar teeth
Kulat gelang	3	3	-	a large bracelet
Kulat gupung	1	-	-	gupu(o)ng, a bouquet, large bunch of fruit
Kulat ikan	4	4	-	ikan, fish
Kulat ipuh	9	-	-	ipuh, poison
Kulat ipuh belalang	1	-	-	ipuh, poison, belalang, cobra
Kulat jarum	1	-	-	jarum, needle
Kulat kasut	1	1	-	kasut, a shoe
Kulat kerang	5	5	-	of rattan or sugar-cane
Kulat kering	6	-	5	strong, tough, hard
Kulat kerup	2	2	-	the sound of biting into or chewing upon
Kulat labit manyi	4	4	-	labit, nest; manyi, bee
Kulat lapar	1	-	-	lapar, hungry
Kulat malam	4	-	-	night
Kulat mangkok	7	6	-	a cup or bowl
Kulat mangkok bulu	2	1	-	mangkok, a cup or bowl; bulu, feather, hairy
Kulat mata babi	1	1	-	mata, eye; babi, pig
Kulat mayau	1	-	-	cat
Kulat merah	2	-	2	red
Kulat minyak	7	7	-	oil
Kulat panyun	11	11	-	a large plant

Table 1 List of collected mushrooms and other fungi (*Continued*)

Iban name	Frequency	Food	Use	Meaning of Iban name
Kulat pending chit	2	2	-	pending, ear; chit, rodent or mouse or rat
Kulat pending mayau	3	3	-	pending, ear; mayau, cat
Kulat peril udok	1	-	-	peril, scrotum; udok, dog
Kulat pik	3	3	-	no meaning
Kulat pinang	1	-	-	pinang, the areca palm
Kulat punas	3	-	3	childress
Kulat rajang	7	-	5	epiphytic fern
Kulat rambut	1	-	-	hair
Kulat repuk	5	5	-	repu(o)k, brittle, rotten
Kulat resak	1	1	-	resak, name of tree (tree species)
Kulat rian	4	4	-	durian
Kulat risik	4	4	-	no meaning
Kulat sawit	1	1	-	oil palm
Kulat suntung	2	-	-	cuttlefish
Kulat tapak lelabi	2	2	-	tapak, paddle; lelabi, a freshwater turtle
Kulat telinga gajah	1	-	-	telinga, ear(M); gajah, an elephant
Kulat tukul	4	-	1	tukul, a hammer
Kulat tusu babi	3	2	-	tusu, breast; babi, pig
Kulat tusu kamba	1	-	1	tusu, breast; kamba cf. bunsu kamba, the little

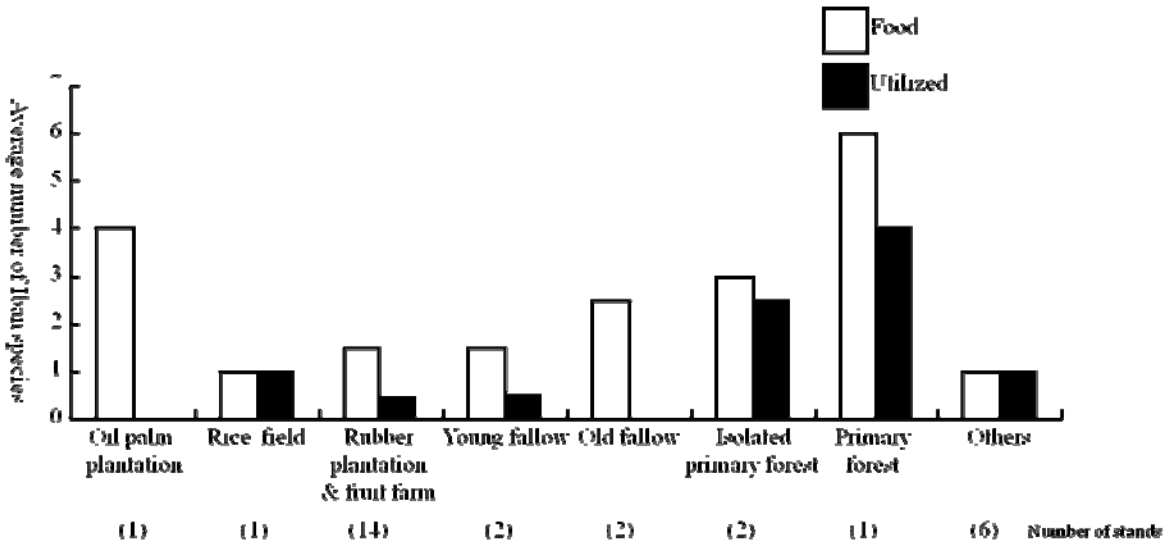

Fig. 1 Number of edible and utilized fungal species in each forest type