

UTILISATION OF FUNGI BY RURAL COMMUNITIES FOR FOOD AND MEDICINE IN PENINSULAR MALAYSIA

Y. S. Chang, S. S. Lee & M. N. R. Noraswati

Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor Darul Ehsan

The indigenous people of Malaysia were known to consume mushrooms for food and to utilise some for medicine. Much of this information still resides with the people and very little published information was available. This paper reported the information collected from five sub-tribes of Orang Asli on the utilisation of mushrooms for food and medicine.

Introduction

In urban areas of Peninsular Malaysia, most of the mushrooms that were consumed as food and/or of medicinal uses were of cultivated and/or imported species e.g. oyster mushroom (*Pleurotus* spp.), shiitake (*Lentinula edodes*), ling-zhi (*Ganoderma lucidum*) and wood ear (*Auricularia auricula-judae*). Many compounds useful to humans, including antibiotics, immuno-potentiators, immuno-suppressants, anti-tumour compounds, etc., were also known to be produced by fungi. However, very little was known of the potential of Malaysian macrofungi as sources of food and medicine. The Orang Asli and other rural communities in Peninsular Malaysia were known to consume certain local wild mushrooms for food and use some species to treat ailments or for spiritual purposes. However, this indigenous knowledge on fungi usage has never been systematically recorded or documented. Like most folk medicine, the claimed of medicinal fungi in treating certain ailments should be scientifically verified before they can be widely adopted or accepted. But before they were investigated, it is important to know what species were present.

The main aim of this project was to conduct a survey and document the utilisation of Malaysian larger fungi as food and/or medicine by rural and indigenous communities in Peninsular Malaysia. Data on selected edible and/or medicinal species will provide the basis for future studies such as cultivation, screening for bioactive compounds and other nutritional components. This information will help us to better understand the diversity and potential of Malaysian forest fungi leading to further scientific investigation and thus, more effective utilisation and conservation of this valuable but neglected resource.

Method

The indigenous communities to be surveyed were identified based on distribution and accessibility in Peninsular Malaysia as well as input from the Department of Orang Asli Affairs (JHEOA). Other rural communities were included wherever possible. A questionnaire and colour illustrated guide of some commonly encountered forest fungi were prepared. The survey was conducted through formatted interviews of individuals using the prepared questionnaire and illustrated fungal guide. Preliminary visits to some selected rural communities were carried out to assess the feasibility and practicality of the questionnaire.

During the questionnaire survey, wherever possible, samples of fungi utilised were photographed and collected and any additional information/data not covered in the questionnaire recorded. Dried samples were used for taxonomic study. Only samples collected in sufficient quantity were subjected to nutritional analysis, particularly in the case of edible fungi, while fresh samples were used for isolation into pure cultures. The strains obtained were maintained in a culture collection for later studies.

Results and discussion

A total of 61 Orang Asli villages were surveyed (Table 1). The sub-tribes included in the survey were Temuan, Semai, Bateq, Che Wong and Jakun. The villages were situated in Selangor, Perak and Pahang. A questionnaire and colour illustrated guide of some commonly encountered forest fungi prepared were shown to the interviewees who are either the Batin or head, or elders of the kampungs. All the interviewees said they ate mushrooms. They learn to recognize the edible, medicinal and poisonous mushrooms from their elders. This knowledge was passed down verbally from one generation to another. They could recognize some that were edible, inedible, medicinal or poisonous, but many they had seen but with no knowledge of their edibility or usage. It was found that the interviewees were sometimes confused by the pictures and would give different names to the same mushroom.

Information obtained through interviews and collections in the field showed that a total of 38 species of larger fungi were utilised as food sources by the Orang Asli (Table 2). The fungi were all collected from the wild and none are cultivated. Opinion of edibility among the interviewees varied and none of the fungi were unanimously considered edible. The majority of the 38 edible fungi were saprophytes.

To all but the Jakun, there was no simple rule for distinguishing edible and poisonous mushrooms. To the Orang Asli, the knowledge passed down from their elders was the guide to distinguish edible and poisonous species of mushrooms. Therefore they usually would not try to eat species that they

were not familiar with. Hence they collected only species that they knew, from their own experience, were edible. Typically, these species were very distinct in their morphology, such as *Amauroderma subresinosum*, *Auricularia auricula-judae*, *Schizophyllum commune*, *Termitomyces microcarpus* and *Clavulina* sp. However, the Jakun insisted that they were taught to use lime to check for edibility of the mushroom. Lime was placed on the mushroom. If the colour changed from white to yellow, then the mushroom is poisonous. If there was no colour changed, then the mushroom was edible. The commonly eaten species across the five sub-tribes included *Termitomyces microcarpus*, *Termitomyces* cf. *heimii*, *Auricularia* spp., *Schizophyllum commune*, *Amauroderma subresinosum*, *Clavulina* sp., *Hygrocybe* sp. and *Lentinus squarrosulus*

Table 1 The sub-tribes of Orang Asli surveyed

Sub-tribe	State	No. surveyed
Temuan	Selangor	5
	Pahang	4
Semai	Perak	16
	Pahang	25
Bateq	Pahang	3
Che Wong	Pahang	2
Jakun	Pahang	6
Total		61

Table 2 The number of species considered edible, medicinal and poisonous by the Orang Asli surveyed based on the 47 species in the fungi guide

Fungi	Temuan Selangor	Temuan Pahang	Semai Perak	Semai Pahang	Bateq	Che Wong	Jakun	Total
No. Edible	21	15	26	33	14	8	23	38
No. Medicinal	10	6	11	12	12	6	4	19

The nutritional values of some of the edible mushrooms were comparable to other foods. For the samples that have been analysed, it was noted that all species (*Schizophyllum commune*, 2 species of *Termitomyces*, and *Amauroderma subresinosum*) showed high protein and low fat contents. The two species of *Termitomyces* that the Orang Asli was very fond of contained higher protein content (39.7 & 29.1%, respectively) compared to the more

common *Schizophyllum commune* (16.7%). The fat content of all species analysed ranged from 0.6% (*Schizophyllum commune*) to 2.3% (*Termitomyces* sp.1). Total carbohydrate level ranged from 3.1% in *Amauroderma subresinosum* to 32.4% in *Termitomyces* sp.1.

Fewer species were used for medicinal purposes. A total of 19 species was recorded across all five sub-tribes (Table 2). One fungus, *Lignosus* cf. *rhinocerus* or 'betes kismas' (Semai name for the fungus) or cendawan susu rimau (Malay name for the fungus) was recognised by >70% of communities surveyed and it has >15 uses according to the different tribes. We were suggesting this species for further study to verify its medicinal properties. Some of its many uses included treatment for fever, cough, asthma, cancer, food poisoning and as a general tonic. Others such as *Pycnoporus sanguineus* was used to treat sore eyes, *Thelephora fuscella* to relieve lower back pain and *Daldinia* spp. to treat festering wounds and skin infection. Some of the mushrooms were used to repel mosquito, to stop a child from crying continuously, to wean a child and to stop bed-wetting in children. For example, *Coriolus hirsutus* and *Microporus xanthopus* are used to repel mosquito; a species of *Amauroderma* was used to stop a child from crying continuously, and *Xylaria* species are used to stop bed-wetting in children.

There was much confusion regarding poisonous species. Very often, the species not eaten were synonymous with poison. Differences in opinion noted within and between sub-tribes. Some were associated with superstition. For example, *Dictyophora indusiata*, was considered unlucky by the Jakun. They believed that if somebody encountered this fungus during his foray, someone will pass away. Incidentally, the Chinese considered this species a delicacy.

Several difficulties are encountered during the project. A major one was the confusion in Orang Asli in recognising the mushrooms from the pictorial guide. This further strengthened the need to collect fresh specimens. However, visits to the communities often could not coincide with the fruiting season of the mushrooms, and hence lack of fresh specimens of mushrooms for validation.

Despite these difficulties, we have received much cooperation from the respective district offices of the Department of Orang Asli Affairs and all the Orang Asli interviewed.

The data collected was representative of the knowledge of the Orang Asli on fungal utilisation in particular the Semai. This documentation of the traditional knowledge of mushroom utilisation of the Orang Asli in Peninsular Malaysia was an important step to conserving the traditional knowledge of these people. However, further work is needed to gather more information from other tribes and to validate the species mentioned by the Orang Asli.

Acknowledgements

We are grateful to MOSTI for the funding to conduct this research. We appreciate very much the assistance from Department of Orang Asli Affairs and most of all the Orang Asli who have been very generous in sharing their knowledge.