AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED BY
DUSUN COMMUNITY IN KAMPUNG BUNGA RAYA
APIN-APIN KENINGAU SABAH

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An Ethnobotanical Study of Medicinal Plants Used by Dusun Community in Kampung Bunga Raya Apin-Apin Keningau Sabah

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This thesis is submitted in fulfillment of the requirement for the degree of Bachelor of Science with Honours Plant Resource Science and Management

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DECLARATION

I hereby declare that this Final Year Project dissertation is based on my original work except for quotation and citation, which have been duly declared that it has not been or concurrently submitted for any degree at UNIMAS or other institutions of high education.

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AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED BY DUSUN COMMUNITY IN KAMPUNG BUNGA RAYA APIN-APIN KENINGAU, SABAH.

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ABSTRACT

Ethnobotany of medicinal plants is the study between human and medicinal plant. This study had been done in Kampung Bunga Raya Apin-Apin Keningau Sabah. It is situated 19 kilometres from Keningau town, and 30 kilometres from the boundary of Malapi Forest Reserve and Trus Madi Range. Survey by interviews session and collecting of specimen had been done in 10 weeks; 6 December 2014-25 February 2015. There were 34 respondents who are knowledgeable with medicinal plants had been interviewed and the data gathered the information on the type of medicinal plants, utilized part, ailments, and mode of consumption. A total of 66 medicinal plants belongs to 40 families have been recorded and 15 specimens have been deposited in Herbarium of Universiti Malaysia Sarawak (HUMS). This study documented plants from Poaceae family; Cymbopogon citratus, Coix lacryma-jobi, Gigantochloa levis, Eleusine indica, Hordeum vulgare, Imperata cylindrica, and Paspalum conjugatum as the most plant mentioned by the respondents followed by plants from Zingiberaceae and Solanaceae family. The most ailment mentioned by the respondents are fever, followed by wound and tooth ache ailment. The remedy can be consumed by two ways; externally by gargling, wrapping, applying or rubbing on the skin, or internally by drinking or eating. The information documented from this study can be used for the further study on phytochemical validation. As the knowledge of medicinal plants are more common by the elderly, there is needs in recording such data to conserve the medicinal plant knowledge so it can be pass on to the future generation.

Keywords: Ethnobotany, Dusun community, Medicinal plants, Kampung Bunga Raya, Keningau Sabah.

ABSTRAK


Kata kunci: Ethnobotani, Masyarakat Dusun, Tumbuhan ubatan, Kampung Bunga Raya, Keningau Sabah.
CHAPTER 1
INTRODUCTION

1.1 Research Background

Ethnobotany of medicinal plant commonly described as the relationship between human and medicinal plants. Jones (1941) described ethnobotany as the study conducted to obtain information on the plants used by the primitive societies at the study area. The role of ethnobotany plays today not only for the documentation of indigenous knowledge for plants conservation purposes, but also for the discovery of plant with medicinal value (Pei, 2001).

Tropical Rain Forests of Southeast Asia have long been acknowledged as one of the most productive type of forests in the world (WWF Malaysia, n.d). Malaysia in particular is recognized as the country with species-rich terrestrial ecosystem and probably plays a great role in the ethnobotany research field.

There are 13 states in Malaysia and Sabah is one of them which is located in the island of Borneo. Sabah population at year 2000 was about half a million people (Dept. Statistics, 2001). Being a part of Borneo, Sabah is very rich in plant biodiversity. The population comprises over thirty-one different ethnic and one of it is Dusun ethnic. Dusun is the largest ethnic group together with Kadazan. The distribution of Dusun ethnic can be found mainly in the interior areas of Kota Belud, Kota Marudu, Ranau, Tambunan and Keningau. Keningau district comprises over five divisions and one of them is Apin-Apin division. In year 2010, population in Keningau district were estimated around 173,103. Situated in a valley surrounded by the Crocker Range to the west and the Trus Madi Range to the east and south, Keningau district itself shows its richness in plant biodiversity. There are abundance of plants not only for daily use but also plants with medicinal properties. The name of the Keningau district was taken from the Dusun name of Cinnamomum verum
which is ‘Kontingau’. Long time ago, Keningau was the district which producing highest number of *Cinnamomum verum* in Sabah.

From ancient times to the present day, human still using plants as the source of medicines even though the development of modern medicines is increasing. The interior community particularly still believe to possess a comprehensive ethnobotanical knowledge (Christensen, 2002). For Dusun community which live in the interior area, knowledge of ethnobotany especially medicinal plants has been the key role for the survival of them.

Usually, ethnobotanical knowledge passes through informally and in an unrecorded form by the elders and practitioners’ men who have a vast knowledge of medicinal plants and their medicinal properties (Jantan, 2006). Medicinal plants have also become an alternative for the ailment prevention and treatment (Azmi et al., 1999). It is believed to give lesser side effect. Thus, research on medicinal plants has become emphasized on this present day

However, many medicinal plants nowadays are now under threat and face extinction or severe genetic loss without adequate documentation has been done. Furthermore, some younger generation today are lack of interest in acquiring the skill and knowledge on the use of plants as most of them are under influenced of modernization and urbanization (Abdul Ghani, 2003).

For this study, Dusun community in Kampung Bunga Raya Apin-Apin division had been chosen. Kampung Bunga Raya located 19 kilometres from Keningau town, while it is situated 30 kilometres from the boundary of Malapi Forest Reserve at the west and Trus Madi Range at the east. This village is still undergoing development even though there are clinic and primary school provided. It is because some of the houses still do not have
electricity and using gravity water, beside some of the roads path along from the highway to the village are still grabbles.

Agricultural activities are the main villager’s source of subsistence and it led for forest clearing to continuously occur in order to open up more spaces for agriculture development. Generation nowadays mostly depends on the modern medication rather than traditional remedies which using medicinal plants since there are clinics in every district and hospitals provided in every town. Due to the different lifestyle of the younger generation and the prior generation, they may not have interest and have less knowledge on medicinal plants compare to the elderly. There are some ethnobotanical study of medicinal plants had been done before in Sabah, however the documentation of medicinal plants knowledge of Dusun community are still lack. This study is an effort to document the knowledge in order to pass on these medicinal plants knowledge from the community to the future generation in a systematic ways.

1.2 Objectives

The objectives of this study are as follows:

- To identify and describe the medicinal plants species used by Dusun community in Kampung Bunga Raya Apin-Apin, Keningau Sabah.
- To document the utilization and general preparation of the plants for the medicinal purposes.
CHAPTER 2
LITERATURE REVIEW

2.1 Ethnobotany Study

The term ethnobotany was first devised by John Harshberger in the year 1895. He was an American botanist and he described ethnobotany as the study of plants used by primitive and aboriginal people (Balick & Cox, 1996). In planning ethnobotanical study, it is very important to define clearly what the objectives of the study are and do well preparation because ethnobotanist may encounter with unexpected complexity which may cause by the weather and so forth.

There are four major interrelated endeavor in ethnobotany study which are the basic documentation of traditional knowledge, quantitative evaluation on the use and management of botanical resources, experimental evaluation on the benefits derived from plants which are for subsistence and commercial ends; and applied project that seek to maximize the value that local attain from their ecological knowledge and resources (Martin, 1995).

Ethnobotany study has the great potential to provide new and useful plant products for the benefit of the world. Many of the plants extracts used were discovered through their uses in traditional societies, though not necessarily for the same purpose. Ethnobotany also has help local communities to adapt on changing circumstances. The practices of ethnobotany are themselves being modified to ensure the rights of traditional peoples and their knowledge are safeguarded and these people benefit from any commercial discoveries made from their knowledge (IUCN, 1993).
Even though many ethnobotanist prefer to do long term study, short term ethnobotanical study also done by them. It include gathering of data on minor forest product for an environmental aspect statement, making a preliminary list of biological resources at sites that have been set aside as protected areas and conducting an initial ethnobotanical inventory in communities (Martin, 1995).

2.2 Medicinal Plants Study in Malaysia

Research on the medicinal plants in Malaysia had shown much progress in the past five decades. The development of medicinal plants study in Malaysia is due to the abundance of the species of medicinal plants in the natural resources. Since many researchers and research organizations have focused their interest on natural products from plants, a concerted effort appears lacking though the world population is on the increase and the plant-rich habitats are diminishing (Latiff, 1991).

Many of medicinal plants study on various ethnic in Malaysia have been carried out by university, Forest Research Institution Malaysia (FRIM), Non-Government Organization (NGO) or private sector and other institutions. Rimi (2007) had done studies on knowledge of medicinal plants by Dusun ethnic at Kinabalu Parks. In her study, a total of 83 plant species have been recorded having medicinal properties.

Latif (2006) reported that study on the chemical active compound in the bark of bintangor trees; Callophylum lanigerum Miq. and Callophylum teysmanii Miq. have shown positive reaction against HIV virus. In Sarawak, there are some studies that have been done before. For example Solehah (2009) reported on a total of 30 medicinal plants species that have been recorded at Padawan and Bau, Sarawak. The other study has been conducted by Alwin (2007). And he reported a total of 44 species of the medicinal plants from 36 families have been used by the Malay communities in Kota Samarahan while Abdul Ghani
(2003) reported 74 plant species from 39 families have been used by Iban communities in Sabal, Sarawak.

2.3 Conservation of medicinal plants

Environment instability resulting from the rapid socio-economic development of the country where most of the forested land had turn into agriculture land, resettlement and later creating new develop area such as agroforestry estate, urban and industrial areas (Latiff, 2006). Moreover exploitation and direct utilization of natural resources such as plants from the forest may lead to the extinction of species.

The most effective way to protect the tropical ecosystem and potential value of medicinal plants that not yet enter market economy can be accomplished through the science of ethnobotany. Apart from that, it can be achieved through ex-situ and in-situ conservation. The ex-situ conservation involves the collection of plant seed and often propagative material for subsequent preservation under controlled condition; whereas in-situ conservation provides reservoir of individual plant which can be buffer the impact of local catastrophes. Example of ex-situ conservation is seed bank and in-situ conservation is Kinabalu National Park (Plotkin, 1995).

For the ex-situ conservation, as much of the medicinal plants are being sourced from forests and other natural habitats, it is a great matter of great concern to assure their proper and sufficient availability of such medicinal plant should be encouraged by government agencies amongst the tribal and rural people. Successful cultivation of medicinal plants with proper linkages along with suitable incentives to the fanning community as well as the industry will substantially reduce pressure on our medicinal plant resources. It will also mean raw material of assured and genuine quality with guaranteed and sustained supply to the industry (Bhattacharjee, 1998).
In-situ conservation is an ideal system for conservation of plants with medicinal value with in nature or in man-made ecosystem in which they normally occur. It is an ideal model of long-term conservation. In situ conservation includes a comprehensive system of protected areas. However these are directed toward the conservation of the habitat as a whole and not specific to medicinal plants. Investigation on the medicinal plants requires a sufficient time period for investigation through studies on population and habitat viability. However, one can easily presume a positive effect about the growth of these plants in natural habitats, association and other favorable conditions. It may be emphasized that in situ conservation is the ideal approach to be followed (Bhattacharjee, 1998).
2.4 Background of Kampung Bunga Raya and Keningau

Keningau is the largest district for the whole interior division of Sabah. This district is approximately 128 kilometres from Kota Kinabalu and can be reached by Kimanis or Tambunan road. It took about 2.5 hours of travelling. Beside land transportation, there is an airport in Keningau, however only foker aircraft type are provided for the operation.

Based on the past history, Keningau district was named from the tree of Cinamnmonum sp. or known as Koningau trees by the locals. Keningau during that time were rich with cinammmom trees which naturally grew and distributed. The bark were peeled off, cut into smaller pieces and dried under the sun. The arrival of the British at the area had made cinnamon trees as one of their export product. Cinnamon trees from the area were very well known not only by the local merchant but also foreign merchant. Indirectly, Keningau at that time had became the largest yield producer of cinnamom product which used as the spice in cooking. Keningau was famed and remains famous and well known until today (Hadi, 2006).

Kampung Bunga Raya is located approximately 19 kilometres from Keningau town. Around 1965, several villagers from Tambunan and Ranau had traveled to find a suitable place for the new settlement. Their migration were because they wanted to open up new area for agricultural purposes and because of during the time schools and hospital were very far from their old settlement. Based on the story from the elders, Kampung Bunga Raya was named from the Bunga Raya shrub which been planted at the area during the time. Agricultural works are their main source of income. Some of the agricultural and plantation works done by them are rubber, paddy, oil palm, and banana planting (Figure 2.1).
Figure 2.1 Agricultural and plantation of (A) Rubber (B) Paddy (C) Oil palm (D) Banana
CHAPTER 3

MATERIALS AND METHODS

3.1 Study Area

An ethnobotanical study of medicinal plants was conducted in Kampung Bunga Raya in Apin-Apin, Keningau. It is situated approximately 19 kilometres from Keningau town, and 30 kilometres from the boundary of Malapi Forest Reserve at the west and Trus Madi Range at the east (Figure 3.1). Generally all the villagers are Dusun community.

Figure 3.1 Map of the Study Area
3.2 Interview Session and Botanical Collection

A total of 34 respondents have been successfully interviewed. Survey method by questionnaire form (Appendix 1) was used to gather the information. Appendix 2 showed the data obtained from one of the respondent. The interview process took up in 10 weeks; 6 December 2014 to 25 February 2015. Informal conversation was applied to the informants for them to elucidate information conveniently. Field note was used for the plants identification and also to write down any useful information such as details appearance of the plants in the field. Photographs of whole or part of the plant were taken to supplement the information included in the field note. The collected plants were numbered, brought back and deposited at the Herbarium of Universiti Malaysia Sarawak (HUMS).

3.3 Preparation of Herbarium Specimens

The specimens were pressed after the collection to prevent from wilting and shriveling. However, specimens kept in sealed plastic bags first after the collection because it was inconvenient to press immediately. In a while, some amount of 70% ethyl alcohol were added into the entire bundle of specimens to prevent rapid mould growth. The specimens were then pressed flat between sheets of newspapers.

Sheets of thick cardboard were placed between the drying folders which assisted the air circulation through the press. Then the specimens were strapped and pressed with metal presser. For the first few days the newspaper were changed daily to fasten the drying process. The drying process was done by using oven at 60°C for a week.

Dried specimens then undergo mounting process. The specimen glued on the acid free mounting paper and carefully arranged so it attached showed all features. The glued specimens were sewn to make it paste strongly. The specimen’s description was attached
on the bottom right-hand corner of the specimen sheet. The complete herbarium specimens were then deposited at the Herbarium of UNIMAS(HUMS).

3.4 Data Analysis

The information that had been collected during the interview session were analysis into figures and tables as displayed in chapter 4.
CHAPTER 4

RESULTS AND DISCUSSION

4.1 Demography information of respondents

An ethnobotanical study of medicinal plants used by Dusun community in Kampung Bunga Raya Apin-Apin, Keningau Sabah had been carried out in 10 weeks; 6 December 2014 to 25 February 2015. A total of 34 respondents who are knowledgeable with medicinal plants have been successfully interviewed.

About their daily work, respondents at an age of 40 years and above do agriculture work, and small business such as selling their agricultural yield at 'tamu’ and opened up mini market at the village. Most of the respondents at an age of 30-40 years are employed to private companies or government. They do agriculture work during weekend as their side income, while several respondents at an age of 30 years and below employed to private companies or government and the rest of them still studying at college or secondary school.

Figure 4.1 showed the number of respondents at an age of 20 years and below were the least while number of respondents at an age of above 60 years were the most which mean the number of respondents increased as the age increased. Since the total of senior respondents (above 40 years) were many than younger respondents, it showed that their knowledge on the medicinal plants are more common compare to younger respondents. They have wider knowledge since they utilized medicinal plants in their daily life. Medicinal plants have become a part of their tradition and heritage culture.
Figure 4.1 Age Range of the Respondents