MEDICINAL PLANTS OF THE IBAN COMMUNITY AT KAMPUNG SEBUBU SARATOK, SRI AMAN

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Bachelor of Science with Honours (Plant Resource Science and Management) 2005
MEDICINAL PLANTS OF THE IBAN COMMUNITY AT KAMPUNG SEBUBU
SARATOK, SRI AMAN

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This project is submitted in partial fulfillment of
the requirements for degree of Bachelor of Science with Honors
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ABSTRACT

A study on medicinal plants was carried out at Kampung Sebubu to document its uses among the Iban community. Thirty species of medicinal plants from 29 genera and 25 families with one species are unidentified were collected and documented. The specimen collected were preserved and kept at Universiti Malaysia Sarawak Herbarium (HUMS). Most of the medicinal plants are used for treating eye infections, shingles, abscesses, body pain, fungal infection, stop flatulence, stop bleeding, reduce high blood and others. Out of 30 species, 10 species were tested for the presence of alkaloid, flavonoid and saponin using their leaves or all part of specimen. The preliminary phytochemical analysis showed that all the 10 species contained alkaloid. Among the species that showed strong positive presence of alkaloid is Lasianthus sp., Premna cordifolia Roxb. and Uncaria acida (Hunt.) Roxb. (+++). In saponin testing, it showed that Nephrolepis biserrata SW. Schoot and Alstonia scholaris (L.) R.Br. had a high saponin contents (+++). Vitex pubescens Vahl., Ficus grossulariodes Burm.f and Phaenathus splendens Miq are have less of saponin (+). All of the species tested showed the present of flavonoid except Lasianthus sp., Vitex pubescens Vahl and Kemedu.

Key words: Medicinal plants, Iban communities, Kampung Sebubu, alkaloid, saponin & flavonoid testing.


Kata kunci: Tumbuhan ubatan, masyarakat Iban, Kampung Sebubu, alkaloid, saponin & flavonoid testing.
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CHAPTER ONE: INTRODUCTION

All known culture from ancient time to the present day has used plants as a source of medicines. According to the World Health Organization (WHO), nearly 70% of the world’s population uses medicinal plant remedies, especially those in the developing and underdeveloped countries. In the underdeveloped countries such as Africa, South America and Asia, the traditional medicines are widely practiced and sometimes plants are used as direct therapeutic agents because they are easily available and cheap compared to modern medicines.

Ironically, documentations on medicinal uses of some medicinal plants in old scriptures, pharmacopoeias and other publications are still poor. Nowadays, traditional medicine practice in this biodiversity-rich country is still very much dependent on ethnopharmacological experience with little engagement of modern science and technology. Traditional medicine practitioners are still amongst the rural folks who have informal education and lead exposed to the knowledge for modern medicine. In developed countries, consumers are seeking alternatives to modern medicine with its danger of over-medication. Many researches and research organizations as well as non-government (NGO’s) have focused their interest on natural products from plants.

There are about 500,000 plant species occupying terrestrial habitats in the world have been estimated. The 35,000 of these are used worldwide for medicinal purpose. Southeast Asia tropical rainforest has been estimated to support 6,500 medicinal plant species. Malaysia’s rainforest where being part of the world’s tropical rainforest biome is also considered as one of the twelve-mega biodiversity. There is estimated about 19.12 million hectares Malaysian rainforest, which covers 58.1% of the country’s land area. This area supports more than
20,000 plant species, out of which 14,500 are flowering or seed plant. Previous reports by Johannes, 1975; Perry & Metzger, 1980; Sudarman & Harsono, 1985; Dharma, 1987; Anonymous, 1989 indicated that there are about 6,000 to 7,000 species of higher plant have been reported to have medicinal properties and being used for many generations in various traditional medicinal system.

In Sabah and Sarawak, there are about 1,200 species reported to have medicinal values. Among the plant families that were commonly used for traditional medicine; Annonaceae, Apocynaceae, Araceae, Compositae, Dioscoreaceae, Ebenaceae, Euphorbiaceae, Flacourtiaceae, Lauraceae, Leguminosae, Menispermaceae, Myrsinaceae, Myrtaceae, Rubiaceae, Rutaceae, Simoroubaceae, Thymelaeceae and Zingiberaceae. Some species of these family such as *Aquilaria malaraccensis* (Thymeleaceae-kayu gaharu), *Eurycoma longifolia* (Simaroubaceae- tongkat ali), *Goniothalamus giganteus* and *G.macrophyllus* (Annonaceae-penawar hitam, Tongkat Ali hitam), *Labisia pumila* (Myrsinaceae-Kacip Fatimah) *Rafflesia cantleyi* (Rafflesiaaceae- bunga pakma) are regularly gathered in a large quantity from the forests.

The extensive uses of some medicinal plants by natives of Sarawak have been reported by Chai (1975, 1978). Chai *et al.*, 1989, also have compiled the lists of medicinal plants in Sarawak. After that, many reports of medicinal plants by Iban community were published; by Pungga (1989), Fasihuddin & Ismail (1999) and the Iban community in Naga Sumpa longhouse by Hanne (2002). The medicinal plants were used by other ethnic of Sarawak also were reported such as the Kalabit community in Bario by Fasihuddin *et al.* (1995) and in Pa

Objectives

This research is a botanical documentation on common traditional medicinal plants used by Iban community at Kampung Sebubu of Saratok division. Some botanical documentation of traditional medicinal plants has been done in Sarawak, and this research is specifically to add further documentation of Sarawak. Objectives of this research are:

1. To identify and document the medicinal plants used by the Iban community at Kampung Sebubu, Saratok.

2. To describe the uses and preparation of the medicinal plants at Kampung Sebubu, Saratok.

3. Preliminary screening test for the presence of alkaloids, flavanoids and saponins of selected species.
CHAPTER TWO: LITERATURE REVIEW

Medicinal Plants

There are about 50,000 plants on the world have been estimated in the various part of the world. The 35,000 of these are used worldwide for medicinal purpose where around 10,000 were used regularly for medicinal purpose (Soepadmo, 1991). A significant portion of these amount, herbs have been well researched and most excellence for cultivation. Herbal medicines which contains synthetic drugs may use safely if an overdose using is avoided and guidance were followed. Another plant product such as fruits is nutritional medicine and it is talismanic to sustain human health.

Medicinal plants were produced one more active constituent capable of preventing or curing an illness. In traditional medicines, the drugs are usually prepared by boiling the plants part or by soaking them into the cold water for some time. There are various methods for preparing the plants before its can use as a medicine. It has depends on the part of the plants are being used and what kind of the illness to be heated. Leaves are usually needed to be boiled into the water or by soaking them into the cold water for some time. Most of traditional medicinal required to drink the decoction or by applying practice over the effected parts.

Traditional Medicine Practice

Traditional medicines are widely practiced in under-developed countries because of the accessibly and affordably compare to modern medicine. In Africa, traditional medicines are classified as personalistic systems in which supernatural causes ascribed to angry deities, ghosts, ancestors and witches predominate (Bever, 1986). Medicinal plants in Africa are
several namely as ingredients for the preparations of traditional remedies; second is as herbs in medicinal soups and teas; phytomedicines prepared in standardized forms but retaining essentials features of their traditional use and sources of biologically active compounds for the development of pharmaceutical dosage forms (Bever, 1986). Traditional medicines are widely used in other under-developed countries such as in Asia but less information are available.

**Chinese Traditional Medicine**

In developing countries, traditional health care usage is still the preferred method although modern medicines are available. In China, the interest in alternative medicines, particularly natural food and Chinese herbal medicine are very high. Those interested include not only people who suffered from chronic diseases, but also patients who are tired of taking medications to minimize the side effects of consuming medication. There are about 7000 species of medicinal plants in China and 150 of those are most commonly used. About 40 percent of the total medicinal consumption was attributed to traditional tribal medicines. China also has exported around 120,000 tones per annum while of herbs (Han, 1997).

**India Traditional Medicine**

In India, majority of known plants are belonging to the flowering plants such as family of Acanthaceae, Apiaceae, Apocynaceae, Asclepiadaceae, Asteraceae, Brassicaceae, Caesalpiniaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Liliaceae, Malvaceae, Mimosaceae, Poaceae, Polygonaceae, Ranunculaceae, Rosaceae, Rubiaceae, Rutaceae, Scrophulariaceae, Verbenaceae and Zingiberaceae (Bever, 1986).
Previous report of medicinal plants in Malaysia

The earliest classical works of knowledge on traditional medicines in Malaysia are representing by Burkill and Hanniff (1930), Gimlett and Burkill (1930) and Burkhill (1935). Burkill (1935), reported that there is more than 1,300 plants have been used in traditional Malay medicine in Malaysia, although this medicinal system is still not well organized as Indian and Chinese systems at that time. In 1984, Latiff et al., 1984 reported that there about 1,082 species and 76 species of 7,000 species of angiosperms and 600 species of ferns in Malaysia have medicinal properties. Hurst (1990) also reported that there are more than 200 was supported of Malaysian forest have potentially medicinal plants.

Potential Medicinal Plants in Malaysia

Malaysia forest represents the richest tropical forests of the regions have potential as a high pharmaceutical storehouse. There are over 20,000 species (accounting for over 10% of the world’s total number of plant species) some of which are unique only to Malaysia (Soepadmo, 1991). The diverse and high density of the flora holds offer great abundance of complex biocompounds such as alkaloids, antibiotics, enzymes, hormones and genetic variability that were potentially source for the modern medicines. Myers (1992) reported that the tropical forests provided an abundance of antibiotic and anti-bacterial compounds. Majority of the 50 percent of modern medicine and pharmaceutical have been derived from plants, also obtained from tropical forest (Chai, 2000). Plants alone contain a range of biological compounds such as analgesics, antibiotics, and hard drugs, and enzymes, hormones, diuretic and anti-parasite. Alkaloid compounds where the most important constituents for medicines manufacturing found in height concentration in tropical forests than elsewhere (Myers, 1992).
Medicines herbal in Malaysia were considered as a potential commercial but there are not fully exploited and cultivated on the large scale. Malaysian herbal industry is majority imported from China, Indonesia and India. The net import on herbal plant products amounted to RM 209 million (Wiart, 2002). Mostly, the uses of medicines herbal in Malaysia is by ethnic group and who lives close to the forest or within them. They use these plants in one form or another to cure or alleviate a variety of ills form bruises, bee or snake bits, tooth or stomachache, bone fractures and malaria. There are also preparations and infusions for diabetes, diarrhea, rheumatism, coughs, anemia and smallpox.

**Alkaloid**

Alkaloids are heterogeneous group that formed a simple compound towards more complex one, pent acyclic structure. Alkaloids are colorless, in a crystal shape but sometimes in liquid form in room temperature. Alkaloids generally are substance which contains one or more nitrogen, usually in combination as a part of a cyclic system. The functions of alkaloids in plants still not be confirmed but some individual substance have been reported involved as growth regulators or as insect repellents or attractants (Harbone, 1973).

Wagner & Wolff (1977) revealed that alkaloids were highly toxic that can affect central nervous system of a human. Active drugs such as morphine, atropine and quinine are also derived from alkaloids. Properties of alkaloid containing herbs include emetic, astringent, expectorant, antiseptic, respiratory tonic, stimulant and nervine. *Alpinia galanga* L. (Lengkuas-Iban,Malay), *Blumea balsamifera* L. (Mambong-Iban, Sembong-Malay), *Morinda citrifolia* L. (Engkudu-Iban, Mengkudu-Malay) and *Carica papaya* (Rungan-Iban, betik
Malay) is some examples of local medicinal plants that contain alkaloid (Fasihuddin et al., 1993).

**Saponin**

Saponins are another secondary compound is commonly found in plant. Saponins divided three major categories: steroid saponins, triterpenoid saponins and sapogenins. Saponins were easy to detect because it has ability to haemolyse red blood cells and forming a stable bubble-like honey comb when shaken with hot aqueous liquid (Fasihuddin & Hasmah, 1993). In vitro, they course of the red bloom corpusium hemolysis (destruction of the blood red corpuscles) (George & Pamplona. 1998). Plants containing saponins are characterized based of their ability to produce frothing aqueous solutions. Saponins were noted for their hemolytic properties.

Saponin is important in human body where it can help to accelerate the body’s ability to absorb other active compounds. Properties of saponin containing herbs include alterative, anticasrtal, antispasmodic, aphrodisiac, emmenagogue, cardiac stimulant and increased longevity. *Medicago sativa, Cimictuga racemosa* (L.) (Nutt) and *Phanax quinquefolius* L. is some examples of herbs that contain saponin. *Callicarpa* sp. (Empenit ukui), *Cassia alata* L.( pokok kurap), *Cordyline terminalis* L. (daun sabang- Iban, Lanjuang- Malay) and *Melastoma malabathricum* L. (Kemunting-Iban, Senduduk-Malay) is examples of local medicinal plants that contain saponin (Fasihuddin et al., 1993).
Flavonoid

Bohm (1982), stated that flavonoid are the largest phenolics compound been accumulated in many plant subdivisions such in gymnosperms, angiosperms and ferns. Compositae, Leguminosae, Ericaceae, Rutaceae, Rosaceae, Anacardiaceae and Coniferae were plant families that are rich in flavonoids compound. Uvaretin and isouvaretin found have antimicrobial and cytotoxic activities as quoted by Hufford & Oguntimein (1980). They are also diuretic (for instance, horsetail), heart-strengthening (hawthorn), haemostatic (as shepherd’s purse, due to the flavonoid called diosmine), and inflammatory (George & Pamplona, 1998). According to Fasihuddin et al., 1993, *Alpinia galanga* L. (Lengkuas-Iban, Malay), *Morinda citrifolia* L. (Engkudu-Iban, Mengkudu-Malay) and *Citrus limon* L. (Limau ragan-Iban, Limau nipis-Malay) are examples of local medicinal plants that contain flavonoid.
CHAPTER THREE: MATERIALS & METHODS

3.1 Ethnobotanical Surveys for botanical information and Herbarium Samples

An ethnobotanical survey was done from August to September at Kampung Sebubu where located about 7 km from the Saratok town (refer Figure 1). During this survey, an interviewed with five practitioners were conducted. Their names and the ages are as follows: Nyandang (70), Libau Nyandang (39), Sela Inggang (74), Jimmy Langan ak. Atok (72) and Alexander Sela (25). Based on the practitioner’s information, all the plants that have medicinal value were collected within the survey area. A maximum of four duplicate of the fertile were collected for herbarium specimen. However, the sterile samples were also collected if no fertile specimens were available. All the fresh collected samples placed in between a sheet of newspaper. The samples were treated with 70 % alcohol solution directly on the field and kept in a plant bag to ensure no fungal contamination would occur. Information about all samples was recorded in detail before the samples are dried. Samples then were identified at least up to genus or species level as possible. The samples are pressed using the metal presser and put in the oven at 60° C for 4 - 5 days. The dried samples were then mounted on the herbarium mounting paper (42 cm X 29 cm) with special glue and sewed. Identification was made at Herbarium Sarawak Forest Department, Kuching and references based on Burkill (1966), Whitmore (1972 & 1973), Ng (1978 & 1989), Ahmad (1988), Barnes & Chan (1990), Abdul Gani (2003), Cartina Luyau (2004) and help from Dr. Cheksum Tawan and Mr. Meekiong Kalu. The mounted samples were then deposited at Herbarium University Malaysia Sarawak (HUMS) for future references.
3.2 Preparation of Extract and Phytochemical Screening

There are ten species of medicinal plants collected are selected based on the common used by the community for phytochemical screening.

**Alkaloid screening** (based on Culvenor and Fitzgerald, 1963)

Five g of pounded dried leaves was placed in a 250 ml beaker. Thirty ml of chloroform (CHCl₃) and 3 ml of ammonia (NH₃) were added into the beaker. The mixture was then shaked in a shaker for 10 minutes. The extract was then filtered by using Whatman Paper No.1 and all the extracts were placed into funnel flask. The solution was added with 10 drops of 2 M Sulphuric acid (H₂SO₄) by using pipette and shaked it for 5 minutes. The extracted mixtures was then divided to 3 parts namely part A, part B and part C. Mayer solution was added into the into test tube labeled A and Wagner solution into test tube labeled B and C as a control. For Mayer test, the formation of white deposits showed the presence of alkaloid compound whereas for Wagner test, the formation of brown sediments showed the presence of alkaloid. The results will be record accordingly. The presence of the alkaloid are quantify qualitatively.

**Prepared for Mayer Solution;**

Mayer solution was prepared by using 1.346 HgCl₂ in 60 ml of water. The solution of 5.00 g KI with 10 ml of water is added in the solution of above. Water is added to solution to become 100 ml. 5 drops of Mayer solution are added into filtered solution labeled A.
Prepared for Wagner Solution;

Wagner solution prepared by added 1.30 g Iodin with 2.00 g KI and added with water until to become 100 ml. 5 drops of Wagner solution are added into filtered solution labeled B.

Flavonoid Screening (adopted from Habrone, 1983)

The dried leaves were crushed finely and pounded by using grinder. Five g of the grinded sample was placed to 250 ml beaker and 100 ml of 70 % alcohol solution was added to the beaker and the solution was left for overnight. The solution was the filtered by using the Whatman Paper No.1 TM. The extracts were collected into the funnel flask and labeled. The extracts were concentrated by putting it into watch glasses and left it until all the solutions evaporated. The concentrating duration may last of 2 days. For faster residual collection, rotor vapour could be used. A few drops of 80 % methanol were used to dissolve the dried extract. The extract from the each species were run using the 2-dimensional paper Chromatography (20 cm X 20 cm chamber) first in a BAW (n-butanol: Acid Acetic: Juice) solvent at a ratio of 4:1:5 and in 15 % Acid Acetic. The spot were identified under the U.V light before and after spraying with ammonia vapor. Color changes were recorded. Tentative identification of the compound was based on the standard reference of Harbone (1983). The results have been recorded accordingly.

Saponin Testing

An amount of 5 g grinded leaves were put in 250 ml beaker and added with 50 ml ethanol of 80 %. The beaker was then heated in water bath for 15 minutes at 90 °C. The solvent were left to cool down and filtered by using Whatman Paper No.1 TM. The extract was poured on watch glass and left over for overnight. The dried extract was diluted with 5 ml of distilled
water and poured back into the test tube and shacked it for 30 seconds. The formation of
bubbles like the shape of honey comb showed that the samples contained saponin after being
left for 30 minutes. The results have been record accordingly based on the foam formation.
Figure 1: Location of the Study Site
CHAPTER FOUR: RESULTS & DISCUSSION

4.1 Species Descriptions, Uses and Preparations

A total of 30 species from 29 genera of 25 families are successfully collected and documented from this study. The descriptions of each species collected are documented included as below. The specific uses and preparation based on the information given the informant are also described. The list of the species and uses are given in Table 1.

1

Botanical name : *Phaenthus splendens* Miq. (Plate 1)

Vernacular name : Semukau, Suluh mata (Iban, Malay)

Family : ANNONACEAE

Location : Long house area

Habitat : A cultivated herb for medicinal purpose

Sample number : AK 1

Descriptions: Small tree, around 6 – 13 cm tall, diameter trunk up to 30 cm, grayish-brown. Leaves simple, alternate, lanceolate, crenulate, cuspidate to emarginated apex, attenuate base; leaf dark green to grey, diameter around 14 – 22 cm length, 3.5 – 5.0 cm width; petiole 0.5 – 1.0 cm. Inflorescence panicle. Flowers solitary, sepals and outer petals 2 mm long. Fruit absent.

Uses and preparations:

The juice extract from young leaves of *Phaenthus splendens* can be use to treats eye infections. About 2 – 3 young leaves of *Phaenthus splendens* were wrapped with a banana leaf and then heated until soft. The heated leaf of *Phaenthus splendens* were applied on the
infected eye three times a day until the eye gets better. [Informant: Jimmy Langan ak. Atok, 72]

Chemically contains: From the phytochemical analysis result, alkaloid, saponin and flavonoid are present in the leaves of *Phaenthus splendens*.

2

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<th>Botanical name</th>
<th>: Annona muricata L. (Plate 2)</th>
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<tr>
<td>Vernacular name</td>
<td>Durian belanda (Iban, Malay)</td>
</tr>
<tr>
<td>Family</td>
<td>ANONACEAE</td>
</tr>
<tr>
<td>Location</td>
<td>Long house area</td>
</tr>
<tr>
<td>Habitat</td>
<td>Cultivated for fruit in gardens</td>
</tr>
<tr>
<td>Sample number</td>
<td>AK 2</td>
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Description: A shrub around 5 – 7 m tall, greyish hard trunk, many branches, rough texture. Leaves simple, alternate, obovate to elliptic, apex caudate, base rounded, smooth margin; leaf dark green, diameter around 9 – 15 cm length, 3.0 – 6.5 cm wide; petiole long around 1.0 – 1.5 cm, axil growth on every bud. Inflorescence axillary. Flower solitary, yellowish, fleshy petals. Fruit heart-shaped but not uniformly, dark green, with soft spines; spines around 0.3 – 0.5 cm long. Seed drupes, dark brown.