MEDICINAL PLANTS OF THE IBAN COMMUNITIES IN SABAL DISTRICT, SARAWAK

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ABSTRACT

A study on medicinal plants was carried out in Sabal district involving 14 villages to review its uses among the Iban communities Sabal district. 74 species of medicinal plants from 39 families were collected and documented. The specimens collected were preserved and kept at Universiti Malaysia Sarawak Herbarium (HUMS). Most of the medicinal plants are used for treating rheumatism, diarrhoea, fungal infections, cough, asthma, bone fractures, sore throat and others. Out of 74 species, 15 species were tested for the presence of alkaloid, flavonoid and saponin using their leaves, roots or barks. The preliminary phytochemical analysis it showed that all of the 15 species contained alkaloid. Among the species that showed strong positive presence of alkaloid are Blumea balsimifera, Zingiber perphyrosphera, Zingiber officinale, Scoparia dulcis, Plectocomiopsis geminiflora and Parkia timoriana. In saponin testing, it showed that Scoparia dulcis, Zingiber officinale, Agrostistachys leptostachya and Croton corifolius had a high content of saponin components(4+). Zingiber perphyrosphaera, Lindera Papercicarpa, Psilobium spp., Cassia alata and Ocimum sanetum are having lesser rate of saponin (1+). All tested species showed a positive result for flavonoid screening except for Zingiber officinale and Plectocomiopsis geminiflora.

Key words: Medicinal plants, Iban communities, Sabal district, alkaloid, flavonoid & saponin testing.
INTRODUCTION

Medicinal plants have been used as curing and healing materials since time immemorial. Knowledge of their medicinal values was mostly passed on orally from one generation to another, leaving us with a vast legacy of undocumented materials. The present practice of traditional medicine depends heavily on information obtained through ethno pharmacological experiences, with very little influence of modern science and technology. This is especially true in remote areas of under developed countries in Africa, South America and Asia where traditional medicines are widely practiced. Although there were documentation on the medicinal uses of some medicinal plants in old scriptures, pharmacopoeias and other publications, the information is just a tip of an iceberg. The traditional medicine practitioners were still amongst the poor rural folks who have informal education and least exposed to the knowledge of modern medicine. However, these traditional healers were experienced and skillful workers who can locate and identify the desired medicinal plants with ease from the forests. About 80% of the rural population in many tropical developing countries still depends on these traditional parishioners for their health care, which also means that the people have to depend on medicinal plants for treatment (Farnsworth et al., 1985). Traditional medicine, particularly herbal remedies, has been used for thousands of years in maintaining health and, in recent years, as an alternative or as a complement to modern medicine. There were more than 35,000 plant species being used in various human cultures around the world for medicinal purposes (Lewington, 1993).

The tropical forest which were endowed with rich and diverse flora was a great storehouse of these medicinal genetic resources. Malaysia being located in the tropical belts still maintains quite substantial areas of tropical rainforest despite the rapid developments that was taking place in the country. Its rainforest stores a large collection of plant species, which was important as the source of traditional medicine. It was estimated that there are about 10 000 species of higher plants and about 2000 species of lower plants available in Peninsular Malaysia with approximately sixteen per cent of these claimed to be used for medicinal purposes and has potential to be developed into various useful natural products. About 1,200 species of higher plants in Peninsular Malaysia and 2,000 species in Sabah and Sarawak were reported to have medicinal values and have been used for generations in various traditional health care systems. Families commonly used medicinally were Annonaceae, Apocynaceae, Araceae, Compositae, Dioscoriaceae, Ebenaceae, Euphorbiaceae, Flacourtiaceae, Lauraceae, Leguminosae, Minispermaceae, Myrsinaceae, Myrtaceae, Rubiaceae, Rutaceae, Simaroubaceae, Thymelaeaceae and Zingiberaceae. These families, especially the Annonaceae, Apocynaceae, Euphorbiaceae and Rubiaceae were popular hunting groups for scientists all over the world in their quest for novel and biologically active compounds (Soepadmo, 1992).

This was the beginning of natural products chemistry research in Malaysia. Since then, several other surveys were conducted and reported by Amarasingham et al. (1964), Chan & Teo (1968), Chan & Teo (1972) and other groups Razak, (1982) and Rahmani et al. (1985). Nakanishi in 1965 not only reported on phytochemical survey, but also included pharmacological screenings.

In Sarawak, Chai et al. (1989) and Hashim & Yusuf (1980) compiled lists of medicinal plants. Various ethnic groups in Sarawak have also been studied (Fasihuddin & Din 1996). These include the Iban (Pungga; 1989; Fasihuddin & Ismail, 1999) the Kelabit
in Bario (Fasihuddin et al., 1995) and Iban in Nanga Sumpa and Kelabit Highland in Pa Dalih (Hans, 2002) and the Melanau in Mukah area (Long, 1999). Chai et al., 1998 describes plants that had been used by various ethnic groups while other studies include Yaman (1994) for Malay communities in Niah while (Christensen, 1997) recorded plants that were used by the Iban community.

Natural products chemistry was an active field of research in Malaysia. Phytochemical screenings were being conducted routinely by various research groups. Most of which has not been fully investigated and are waiting to be discovered. This was further enhanced by the blend of its multiracial societies which stores broad traditional knowledge about the folkloric uses of many plants for health care and other purposes. It was expected that research in this area could generate new knowledge and information about the plants not found in other parts of the world. An example was the isolation of calanolide A, a compound which was shown to possess anti HIV activity from *Calophyllum langiuerum* found in Sarawak. (Nordin & Norhadini, 1998)

In Sarawak, the various ethnic communities have acquired this knowledge, through traditional belief and practice, from their elders and ancestors. The Botany Unit of the Forest Department has been documenting uses of medicinal plants as employed by the local communities since the early 70's. To date, a total of 1,300 plants from 135 families have been recorded, each with the description of the preparatory method, its uses, the material and quantity to be utilized. This baseline data will facilitate the search for new drug to treat mankind's diseases. The natives of Sarawak especially the Iban, Bidayuh, Malay, Melanau and Orang Ulu were the largest tribes that manipulate medicinal plants as a remedy for several known diseases. Until 1989, there were about 285 species of medicinal plants had been identified having potential medicinal uses by the Forestry Botany Unit, Sarawak Forest Department (Chai, et al., 1989). Seventy-five species of medicinal plants from different families and species were collected and documented with the help of the dukun or manang (traditional medicine practice tioner). The dukun or manang was the important person whom has much knowledge on the usage of plants as a medicine beside some other expert old folks. An ethnobotanical survey was conducted in Sabal district involving the Iban communities to figure out the uses of medicinal plants amongst them. The survey was done in fourteen Iban villages that located at Sabal area, Sri Aman Dvision.

Preliminary investigation showed that medicinal plants were being used in two major ways for external uses and internal uses. According to manang, for external purposes the medicinal plants were usually crushed into paste. Sometimes ointment oil is added in and applied on the skin as a hot poultice. These were normally applied for curing or alleviate pain from bone fractures, aching limbs, tooth or stomach ache, rheumatic pain, rashes, bruises, bee or snake bites and so on. For internal uses, the fresh or dried plant materials were normally boiled to make a tonic preparation. It must be keep warm before taken twice or thrice a day. These medicinal preparations were effective to reduce pain or lessen illness of coughs, asthma, diarrhea, fever, hypertension, parasitic worms in stomach, sore throat, antidotes against food poisoning and a few other remedies.
OBJECTIVES

This research is a continuity of a general botanical documentation on common medicinal plants used by the Iban communities previously documented in Kota Samarahan district by Camillus Benno, (2000). Sabal District was selected since there was no transcript of it was ever made by other researcher even though the area classified under Forest Reserve and was included into Reforestation and Rehabilitation programmed since 1979 by Sarawak Forest Department. The main objectives are:

i) Identification and documentation of the uses and preparation specifically of each species collected.
ii) To produce basic deseriptions and include photograph of the identified species.
iii) Preliminary screening for the presence of alkaloids, flavonoids and saponins.

LITERATURE REVIEW

Medicinal Plants

Tropical forests represent nature's main storehouse of natural resources and raw materials for modern medicine. In addition to this, tropical forests also provide an abundance of antibiotic and anti-bacterial compounds (Myers, 1992). It was common knowledge that as much as 50 percent of modern medicine and pharmaceutical products have been derived from plants, the majority of them from the tropical forest (Chai, 2000). Plants alone offer a range of compounds which are analgesics, antibiotics, hard drugs, enzymes, hormones, diuretic, anti-parasite and with several other properties. One of the most important constituents for the manufacturing of medicines was alkaloid and these compounds were found in highest concentration in tropical forests than elsewhere (Myers, 1992).

Of the estimated 500,000 plants on the world, it is thought that around 10,000 were used regularly for medicinal purposes. A significant proportion of this herbs have been well researched and most excellence for utilization (Andrew, 2001). It has been reported that about 75 percent of more than 200 drugs that are derived from plants and used in prescription worldwide were discovered following native folklore claims of their efficacy. Herbal medicines were regarded by many as being safer than synthetic drugs as they were natural. Their use can be quite safe if an overdose is avoided and guidance or advice from trained and experience practitioners were followed. Nutritional medicine from fruits, vegetables and other plant products as a form of natural cure and to maintain health has developed into an attractive business in recent years. (Chai, 2000)

In developing countries, the use of a local traditional medicinal plays a great role and was still the main role of health care. The practice of medicinal medicine was widespread in China, India, Pakistan, Sri Langka and Thailand. In China about 40 percent of the total medicinal consumption was attributed to traditional tribal medicines and this country exported herbs amounting to over 120,000 tones per annum while. India exported 32,000 tones of tones of herbs annually. In the mid 90's, in Thailand, the sales of herbal medicine was worth more than US$2.5 billion. In Indonesia, currently there are about 350 companies dealing with medicinal plants and herbal remedies and
they generated US$360 million sales just on the domestic market. Africa is a rich source of medicinal plants. In Southern part of Africa, there are about 500 species of herbs that have been commercialized as trade products. Sudan and Egypt were one of the major exporters of *Centella asiatica* L. (Pegaga). Madagascar was the chief exporter of pharmaceutical raw materials of *Centella asiatica* and *Catharanthus roseus* periwinkle. There was also growing demand of herbs in the industrialized societies where, plant derived prescription drugs and phytomedicines constitute an important element in the maintenance of health. In Germany, for example, over 1500 plant species encountered in some 200 families and 800 genera have been processed into medicinal products. Today, Bulgaria, Germany and Poland were recognized as major exporters of plants-based medicinal products (Indu, 2002).

In Japan, the market on Chinese medicinal plant was worth about US$2 billion annually (Anon, 1997). More than 180 varieties of plants were scientifically recognized for medicinal purposes. Traditional medicines in China make up 40 percent of the world market (Ikram, 1999).

Currently in Malaysia, herbs were considered as a potential commercial plant but have not fully exploited and cultivated on a large scale. In Malaysia, the herbal industry is at its development stage with the majority of the new materials and products were imported mainly from China, Indonesia and India. In 1996, the net import on herbal plant products amounted to RM209 million representing 14% of the country’s overall import. The value of the domestic market for herbs and medicinal plants in 1998 was estimated at RM2.0 billion, RM1.6 billion and RM0.95 billion for herbal remedies, flavors and fragrance and Pharmaceuticals / Nutraceuticals respectively (Mohd. Azmi at al., 1999).

**Alkaloids**

Alkaloids were heterogeneous group that formed a simple compound towards more complex one, pent acyclic structure. Alkaloids were colorless, in a crystal shape but sometimes in liquid form in room temperature. Wagner & Wolff (1977) revealed that alkaloids were highly toxic that it can affect central nervous system of a human. Active drugs such as morphine, atropine, nicotine and quinine were derived from alkaloids.

An alkaloid was formerly thought of as a bitter alkaline compound (neutralizing acid) creating the term, alkaloid. Today, however, an alkaloid means any organic compound that contains nitrogen and has physiologic activity. Purified alkaloids were some of the most potent drugs known to man. The central nervous system active drugs from the opium poppy and the coca leaf were some of the most noted alkaloids.

Properties of alkaloid containing herbs include: emetic, astringent, expectorant, antiseptic, respiratory tonic, stimulant and nervine. Examples of alkaloid containing herbs are: *Leochoma hederacea*, *Catha edulis* Vahl., *Chamaesyce hypericifolia* Millsn and *Chelidonium majus* (James, 1985).

**Flavonoid**

Bohm (1982) stated that flavonoids were 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 rich in flavonoids compound such as phloretin,
phloridzin, asebotin, uvaretin and isouvaretin. Uvaretin and isouvaretin found having antimicrobial and cytotoxic activities as quoted by Hufford & Oguntimein (1980). These glycosides constitute a wide group of chemical substances whose common property was to reinforce capillary walls, improving the exchange of nutrients and oxygen between the blood and tissues. 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).

Saponin

Another secondary compound that commonly found in plant were saponins. Saponins divided into three major categories: steroid saponins, triterpenoid saponins and sapogenins. Saponins were easy to detect because it has an 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 blood corpusium hemolysis (destruction of the blood red corpuscies) (George & Pamplona, 1998). Plants containing saponins have long been characterized for their ability to produce frothing aqueous solutions. The detergent properties of saponins result in the emulsification of fat soluble molecules in the digestive tract. Saponins were noted for their hemolytic properties. They effectively dissolve the cell walls of red blood cells and disrupt them. When taken orally, however, they were comparatively harmless or they were not absorbed at all. Saponins owe their emulsifying properties to the chemicals where either a steroid or triterpene fat-soluble base molecule was joined to a juice-soluble sugar molecule.

Saponins’ most important property was to accelerate the body’s ability to absorb other active compounds. Some saponins were also diuretic and antispasmodic. Properties of saponin containing herbs include alterative, anticatarrhal, antispasmodic, aphrodisiac, emmenagogue, cardiac stimulant and increased longevity. Examples of saponin containing herbs were: *Medicago sativa* L., *Cimicituga racemosa* (L)Nutt.and *Phanax quinquefolius* L. (James, 1985)

**RESEARCH METHODOLOGY**

**Botanical Informations and Herbarium Samples**

An ethnobotanical survey was done in eight Iban villages in Sabal district as listed in *Table 1*, from 23 - 28 July 2002. The distance between Sabal district and Simunjan was 55 km, Sabal district and Sri Aman was 82 km and Sabal district and Kuching was 108 km and respectively. The map of Sabal district and all the villages are suown in *Map 1*. Informations were obtained through several interviews with medicinal practitioners (*dukun / manang*) or expert old folks. During the field survey, the morphological features and medicinal uses were recorded. The collected samples must be complete with flowers or fruits for identification purposes. However, in cases where fertile specimens were not available sterile are were also collected.
Table 1: Iban villages that Located at Sabal area, Sri Aman Division

<table>
<thead>
<tr>
<th>Bil.</th>
<th>Iban Village</th>
<th>Ketua Kaum</th>
<th>Manang(Iban)/Dukun</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kg. Sungai Kura</td>
<td>Steven Jenang</td>
<td>Ringkai ak Ayang 75 yrs Lai ak Ampuh 78 yrs</td>
<td>N 01°04'06.5&quot; E 110°54'10.2&quot;</td>
</tr>
<tr>
<td>2</td>
<td>Kg. Nyelitak Ulu</td>
<td>Jalang</td>
<td>Tr Jalang 58 yrs</td>
<td>N 01°06'37.2&quot; E 110°55'50.5&quot;</td>
</tr>
<tr>
<td>3</td>
<td>Kg. Nyelitak Baru</td>
<td>Jalang</td>
<td>Randi ak Ugeng 57 yrs Medang ak Sigi 61 yrs</td>
<td>N 01°06'37.2&quot; E 110°55'50.5&quot;</td>
</tr>
<tr>
<td>4</td>
<td>Kg. Abok Pulau Batu</td>
<td>Donald Martin</td>
<td>Numpang ak Rundu 46 yrs</td>
<td>N 01°04'37.5&quot; E 110°57'77.9&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Kg. Abok Jenang</td>
<td>Donald Martin</td>
<td>Jaum ak Gobil 85 yrs</td>
<td>N 01°04'54.2&quot; E 111°00'78.5&quot;</td>
</tr>
<tr>
<td>6</td>
<td>Kg. Lacau Ili</td>
<td>Randi Ugeng</td>
<td>Randi Ugeng 57 yrs Medang Sigi 62 yrs</td>
<td>N 01°05'06.2&quot; E 111°10'73.0&quot;</td>
</tr>
<tr>
<td>7</td>
<td>Kg. Sabal Aping</td>
<td>Bee Tai</td>
<td>Tinjaru ak Seliung 45 yrs</td>
<td>N 01°04'42.8&quot; E 110°54'59.9&quot;</td>
</tr>
<tr>
<td>8</td>
<td>Kg. Sabal Tapang</td>
<td>Lee Jong Moh</td>
<td>Kepitan Lee 58 yrs (Cina Hailam)</td>
<td>N 01°05'28.3&quot; E 110°55'21.4&quot;</td>
</tr>
<tr>
<td>9</td>
<td>Kg. Telagus</td>
<td>Peter Muni</td>
<td>Tr Peter Muni 56 yrs Ensawy ak Untang 62 yrs</td>
<td>N 01°36'54.1&quot; E 110°20'28.6&quot;</td>
</tr>
<tr>
<td>10</td>
<td>Kg. Sabal Keruing</td>
<td>Jetai Nyabang</td>
<td>Nulik Ak Rumbang 80 yrs Sarang ak Rumbang 78 yrs Pigit ak Nuung 50 yrs</td>
<td>N 01°04'37.6&quot; E 110°57'79.0&quot;</td>
</tr>
<tr>
<td>11</td>
<td>Rh. Kerapak</td>
<td>Akean</td>
<td>Akean 77 yrs Raba ak Arit 58 yrs</td>
<td>N 10°03'89.9&quot; E 110°52'70.4&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Rh. Sebangkui Jaya</td>
<td>Suntat Galang</td>
<td>Suntat Galang 63 yrs Empina ak Tamin 55 yrs Kumpai ak Jaung 50 yrs Kebari ak Meta 80 yrs</td>
<td>N 01°06'24.1&quot; E 110°53'11.3&quot;</td>
</tr>
<tr>
<td>13</td>
<td>Rh Abok. Mawang</td>
<td>Donald Martin</td>
<td>Donald Martin 48 yrs Ipil ak Minggat 45 yrs Sungki ak Juung 60 yrs</td>
<td>N 01°06'51.4&quot; E 110°53'22.5&quot;</td>
</tr>
<tr>
<td>14</td>
<td>Rh. Mungu Air</td>
<td>Saman</td>
<td>Saman 85 yrs Gendang 62 yrs Langgai 51 yrs</td>
<td>N 01°14'54.0&quot; E 110°54'11.8&quot;</td>
</tr>
</tbody>
</table>

The fresh collected samples were treated with 70% of alcohol solution to ensure that no fungal contamination would be occurred after the samples being dried. Before the samples being dried, general information of it must be noted to identify its family and genus. The samples were then pressed and dried in oven at 60°C for 4 to 6 days. The dried samples are then mounted on acid free herbarium sheet (42 cm X 29.5 cm) with special glue and sewed. The mounted samples were kept at Herbarium University Malaysia Sarawak (HUMS) further references. References on botanical aspects were made from local botanical references based on Burkill (1966), Whitmore (1972 & 1973), Ng (1978 & 1989). Further identifications were conducted at Herbarium Unit of Sarawak Forest Department, Kuching.

**Phytochemical Screening**

Phytochemical screening was one of the basic way to determine the presence of chemical compound in plant samples (Harborne, 1983). With this method, chemical compounds such as alkaloids, flavonoids, anthocyanins, steroids, saponins, triterpenoids and many more in selected medicinal plants can be detected.
1. Fifteen selected species were tested for the presence of alkaloids, flavonoids and saponin from their respective part based on the information obtained.

2. Methods for screening were as follows:

i) **Alkaloid Screening** (Based on Culvenor and Fitzgerald, 1963)

5 g of dried and pounded leaves were put in 250 ml beaker. 30 ml of chloroform (CHCl₃) and 3 ml of ammonia (NH₃) were added into the beaker. The mixture then shaken in a shaker for 10 minutes in medium speed. Filter it by using Whatman Paper No. 1™ and all the extracts were funnelled into funnel flask. Add in 10 drops of 2 M sulphuric acid (H₂SO₄) by using pipette and shake it again for 5 minutes. The extracts was filtered by using Buchner flask to separate chloroform. The extracted mixture were divided to 3 parts that are part A, part B and part C. Confirmatory test was be conducted by adding Mayer solution into test tube labeled A, Wagner solution into test tube labeled B and C as a control. For Mayer test, the emergencee of white deposits showed the presence of alkaloid compound whereas for Wagner test, the formation of brown sediments showed the presence of alkaloid.

**Flavonoid Screening** (Based on Habrone method, 1983)

The dried leaves were crushed finely and pounded by using leaf grinder. 5 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 then filtered by using the Whatman Paper No. 1™. The extracts were collected into the funnel flask and labeled. The extracts were concentrated by putting it onto watch glasses and left it until all the solutions evaporated. The concentrating duration may last for 2 days. For faster residual collection, rotor vapour could be used. A few drops of 80 % ethanol was used to dissolve the dried extract.

**Paper Chromatography (PC)**

The extract from the each species were run using 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. Rf value from each spots were determined. Tentative identification of the compound were based on the standard reference Harborne (1983).

ii) **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 juice bath for 15 minutes at90 °C. The solvent were left to cool down and filtered by using Whatman Paper No. 1™. The extract was poured on watch glass and left over for overnight. The dried extract was diluted with 5 ml of distilled juice and poured back into the test tube and shaked it for 30 seconds. The formation of bubbles like the shape of honey comb showed that the sample contained saponin after being left for 30 minutes.
RESULTS

A total of seventy-four (74) species from thirty-nine (39) families of medicinal plants used by the Iban communities were recorded from the ethnobotanical survey conducted at the 14 villages at Sabal District Serian. In 14 villages that being surveyed, twenty-eight persons were being interviewed were sawn in Table 1, for ethnobotanical data collections. They were being interviewed based on their wide knowledge on the usage of medicinal plants. Most of them were the dukun/ manang (medicine man) and some expert old folks. Six families that recorded the most number of species were Euphorbiaceae, Leguminose, Liliaceae, Piperaceae, Rubiaceae and Zingiberaceae. Samples collected were preserved as herbarium specimens and were kept at Herbarium Universiti Malaysia Sarawak (HUMS). Most of the informants were between 45 years to 85 years old. From the survey conducted it was evident that the younger generation in most long houses were no longer aware or having the knowledge of the uses of traditional medicinal plants and even their species names.

Below are the full descriptions of some common medicinal plants being used by the Iban communities in Sabal district.

Description of Medicinal Plants

1

Botanical name: Acorus gramineus Soland.
Vernacular name: Jerigau (Iban), Jerangau putih (Malay)
Family: ARACEAE
Habitat: Grown wild near river bank of peat swamp and secondary forest. Sometimes planted for medicinal purposes.

Description: A grass-like herb up to 60 cm tall. With creeping and branching stems. Rhizome large (2 cm x 20 cm) and fragrant. Leaves dark green, shining, distichous, ensiform, upright, reddish at the base and long (90 cm - 2 m x 1.8 cm - 3.75 cm). Spathe large (15 cm - 75 cm), ensiform, upright, continuous with the pedicel (47.5 cm). Spadix green, sessile, cylindrical, densely flowered and long (5 cm - 10 cm). Sepals 6, orbicular. Fruit a berry containing a few seeds. Leaves erect, distichous, without a distinct midrib, dark green, not aromatic.

Medicinal uses: The rhizome of Acorus gramineus is principally used to invigorate, soothe inflammation and to treat skin infection and lumbago, the rhizome is used to invigorate, promote digestion, appetite, stop flatulence, spasms, convulsion, and to reduce fever. The juice extracted from the rhizome is used to heal buboes, treat lumbago and to invigorate after childbirth. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61 Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak. Laing 50).

Chemical constituents: Rhizome of Acorus gramineus contains an essential oil (2% to 9%) which consists of a mixture of phenylpropanoids. One such compound is asarone, the chemical structure of which is similar to the chemical structure of norepinephrine. Asarone has calming, anti-ulcer, anti-sclerosing and hypocholesterolaemic properties (Wiart, 2002)
2

Botanical name: *Alpinia galanga* (L.) Willd. (Plate 19)

Vernacular name: Lengkuas (Iban, Malay), Lungkos (Bidayuh)
Family: ZINGIBERACEAE
Habitat: Grown wild on jungle clearings. Much cultivated for spices and medicinal purposes.

Description: A robust, tillering, perennial weed up to 3.5 m high with subterranean, creeping, copiously branched rhizomes. Rhizomes 2-4 cm in diameter, hard, shining, light red or pale yellow. Leaves alternate, distichous, lowest and uppermost ones smallest; blades oblong-lanceolate, (20-) 50 (-60) cm x (4-) 9 (-15) cm, shiny green, densely white-dotted. Inflorescence terminal, erect, many-flowered, racemiform, 10-30 cm x 5-7 cm. Flowers fragrant, 3-4 cm long, yellowish white; calyx tubular. Fruits spherical-ellipsoid, 1-1.5 cm in diameter.

Medicinal uses: The juice of the rhizomes is mixed with human urine and taken orally for relieving snake bites poisoning. The rhizomes are boiled to drink to cure food poisoning, diarrhoea and stomach cancer while the vapour of the boiled rhizomes fumed to ear to lessen ear pain. The rhizomes are made into paste for treating ringworm and fungal infections. An infusion from leaves is taken for bath after childbirth to reduce muscular strain. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: According to Fasihuddin et al. (1993) and Jaganath et al. (2000), *Alpinia galanga* contained cadinene, cineol, eugenol, galangin, galangol, lineol and essential oils the whole plant. Also contained alkaloid and flavonoid components as a result from phytochemical analysis result.

3

Botanical name: *Artocarpus heterophyllus* Lamk (Plate 27)
Vernacular name: Nangka (Iban, Malay)
Family: MORACEAE
Habitat: A cultivated fruit tree. Much found on fruit gardens.

Description: An evergreen tree reaching 18 m tall. Leaves simple, spiral, and stipulate. Petiole long (1.25 cm - 4 cm). Blade elliptic to obovate, thinly coriaceous, shiny, deep green above, dull beneath, and of variable size (5 cm - 23 cm x 2 cm -11 cm). Flowers unisexual and arranged in heads. Male and female heads axillary. Fruit set with conical warts, cauliflorous, greenish-yellow, pear-shaped, very large (30 cm - 90 cm) weighing up to 20 kg and having a distinctive smell. The pulp around the seeds is orange, smelly and edible. Seeds large (4 cm x 2 cm), ovoid, brownish, smooth and embedded within a thick gelatinous jacket.

Medicinal uses: To avoid the cut/wound to be crocelly. The leaves need to be burnt (tunu) and the ash to be applied on the cut/wound (ubat ndak murok- Iban). The latex of *Artocarpus heterophyllus* Lamk. is used to heal ulcers and abscesses and the roots, to stop diarrhea. The ashes of leaves, on the other hand, are used to heal wounds. The ripe fruits are consumed to help reducing high body temperature. Burnt leaves to dark and used it to cure wounds and abscesses when mixed together with coconut oil. A
decoction from roots is used to relieve diarrhoea. The latex obtained from bark is effective to lessen poison of animal bites. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: The leaves and stems of *Artocarpus heterophyllus* contained alkaloid and saponin cynomaclurine. The bark having yellowish pigment called morine and Cyanomaclurine while its latex having cerotic acid (Fasihuddin et al., 1993). A number of prenylflavones characterized from *Artocarpus heterophyllus* Lamk. exhibit anti-oxidant and anti-microbial properties in vitro. Cycloheterophyllin, artonin A and artonin B inhibit iron-induced lipid peroxydation in rat brain homogenate, scavenge 1,1,-diphenyl-2-picrylhydrazyl (DPPH), peroxyl radicals, and scavenge hydroxyl radicals (Wiart. 2002).

4 (AGM 018)

**Botanical name:** *Blumea balsamifera* (L.) D.C. (Plate 51)

**Vernacular name:** Mambong (Iban), Sembong (Malay), Susuoh (Bidayuh), Urok Bung (Kayan), Dun Supiro (Kiput), and Keymabo (Selakau).

**Family:** COMPOSITAE

**Habitat:** Grown wild on open area. Much cultivated for its medicinal value.

**Description:** A tomentose shrub. Leaves simple, without stipules and alternate. Blade large (7 cm - 13 cm x 2.5 cm - 5 cm) membraneous, elliptic-lanceolate, apex acute, base narrow, margin serrate-dentate and hairy beneath. Petiole long (2.5 cm). Heads minute (5 mm) in a large terminal panicle. Flowers yellow and tiny. Ray-florets in whorls, female, filiform with 2 - 3 lobes. Few, bisexual disc-florets. Involucres ovoid. Bracts in whorls, linear acuminate and hairy. Pappus red when dry. Achene 10-ribbed.

**Medicinal uses:** The dried young leaves from *Blumea balsamifera* boiled and with coarse salt it can be used for bathing to reduce the high fever and after delivery. Burn the dried leave, the smoke believed to evict evil spirit. A decoction of the leaves is used to treat beriberi, lumbago, and rheumatism, and for post-natal invigoration. The crushed leaves are used to stop bleeding, heal wounds, ease headache, rheumatism and after childbirth. To lessen chest pain, add in some coconut oil to the rub it on the chest. The extract from the leaves upon boiling is drunk for curing cough and to stimulate sweating process. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

**Chemical constituents:** Wiart, (2002) stated that *Blumea balsamifera* contained camphor, borneol, camphor and cineole, which counteract putrefaction, stop flatulence, spasms and promote expectoration. Fasihuddin, et al., (1993) quoted that tannins, glycosides, alkaloids and saponins are present.

**Special notes on Blumea balsamifera**

In China, Taiwan and Japan: the ngai camphor is used to reduce fever, stop flatulence, promote expectoration and to counteract putrefaction. In Indonesia, the leaves are used to promote urination and to invigorate. In Vietnam, a decoction of 6 g - 12 g of leaves is used to treat coryza, influenza, reduce fever, alleviate cough and to promote digestion. A poultice of the powdered leaves is used to heal haemorrhoids and an alcoholic extracts is used to treat rheumatism. The ngai camphor contains borneol, camphor and cineole, which counteract putrefaction, stop flatulence, spasms and promote expectoration. In Malaysia, a decoction of the leaves is used to treat beriberi, lumbago,
and rheumatism, and for post-natal invigoration. The crushed leaves are used to stop
bleeding, heal wounds, and to ease headache. (Wiart 2002)

**Potential as Medicine:** The leaf or the plant itself has been used by the rural
community in the traditional medicine to cure fever, head aches, small-pox, beri-beri
cut/injury, cough, joint pains, eliminate the wind, diarrhoea and stomach ache.
However, it is more popular used as an ingredient in baths for women after giving
birth. (Burkll, 1935; Burkll & Haniff, 1930; Chai, 1978; Chai et al., 1989; Anon,
1992; Fasihuddin & Hasmah, 1992; Muhamad & Mustafa, 1992). Apart from being
the ingredient in baths for newly born baby, others can use this plant as a bath
ingredient to fresher the body by boiling the plant and soak themselves with the juice.

**Prospect:** The trees can be easily finds because it grows well and fast in the open paces
such as burned land and around the longhouses and villages. Based on the survey done,
the most popular method use of this plant is as an ingredient for bath prepared
especially for women on confinement. Six pieces of *Blumea balsamifera* (sembong)
leaves, 3 pieces of young areca catechu (pinang), 6 pieces of *Piper betle* (Sirih) leaves
and 3 pieces *Cucurma domestica* (kunyit) are boiled together and the boiling juice
used for a steam bath. The person and the boiling pot are placed in a rolled
‘mengkuang’ mat with the top covered with layer of cloth until the person sweats.
However in today’s community this method is seldom practice instead the local
people would sager to seek treatment from the clinic and hospital.

From the dilution test carried out ‘sembong’ leaves are dried in room temperature,
ground, boiled and diluted until the substance turns yellow. From the experiment
17.18g ‘sembong’ powder was found suitable for baths and spas (Standard Range)
1600mm (L) X 700mm (W) X 350 mm (D) and 35.62g (Premium Range) 1780mm
(L) X 980mm (W) X 428 mm (D). The powder weight studied is for usage for baths
and spas. Based on this approach, the powder can be wrapped with cloth and soaked
in boiling juice before being poured into the bath juice. This method can easily be
used in hotels and at home.

**5**

| Botanical name | : *Callicarpa* sp. |
| Vernacular name | : Empenit ukui, Empait ukui (Iban) |
| Family | : VERBENACEAE |
| Habitat | : Grown wild on lowland area and secondary forest. |

**Description:** An evergreen shrub to small tree between 3 - 6 m tall. Leaves simple,
opposite, cordate shaped, pointed at end, undersides of the leaves white, hairy with
small buds. Inflorescence terminal, hairy, rusty-white. Flowers very small, regular, pink
or lilac in colour. Fruit a small berry.

**Medicinal uses:** Cure for itchiness, leaves pouded and spread over the affected skin or
leaves are boiled and for patient bath. The leaves are mixed with kapor can be applied
on skin affected with fungal infections/ ringworm. Lime (Kapur) is used to tread fungal
infection such as ringworm. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat
ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

**Chemical constituents:** From the phytochemical analysis result, alkaloid, saponin and
flavonoid are present in the leaves of *Callicarpa* sp.
Botanical name : *Calopyllum* sp.
Vernacular name : Entangor (Iban), Bintangor (Malay)
Family : GUTTIFERAE
Habitat : Grown wild on virgin forest, swampy peat area, sandy soils and Sometimes planted as a roadside tree.

Description: An evergreen tree between 40 – 60 m tall, with conical crown. Bark grey to fawn, with wide, shallow, markedly boat-shaped fissures. Clear golden yellow sticky gum-resin. Leaves simple, without stipules and decussate. The blade large (8 cm - 16 cm x 4 cm - 8 cm), elliptic-oblong, thinly coriaceous, shiny and leathery with round or notched apex and tapering base. Secondary nerves characteristically numerous, distinct, parallel and straight. Inflorescence: long (7 cm - 8 cm) laxly flowered axillary raceme. Flowers magnificent, delicate, conspicuous (1 cm), and supported by slender (3 cm) and white pedicels. The fruit is a globose, large (2cm) and green drupe.

Medicinal uses: The decoction of the root is taken orally to treat rheumatic pains. Juice from crushed leaves is used to treat eyes irritation or conjunctivitis. Leaves are made into decoction and drink to treat stomach ache. Oil obtained from the fruits are applied and rubbed on the limbs of children who are slow at learning to walk. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: Steiner (1986) The genus *Calopyllum* contained oleic acid, linoleic acid, fatty acid, calophyllic acid, ponnalide and calophyllolide.

Botanical name : *Cassia alata* L. (Plate 7)
Vernacular name : Serugam, rugam (Iban), Gelenggang, pokok kurap (Malay).
Family : LEGUMINOSAE
Habitat : Grown wild on disturbed soils and damp area

Description: A shrub up to 1-3 m, height. Leaves pinnate, long (30 cm - 50 cm), with winged rachis. Leaflets several (10 – 20), oblong, round, and slightly coriaceous. Stipule triangular and persistent. Flowers terminal, axillary, and upright spike-shaped raceme. Sepals 5, spatulate, obtuse, and long (1 cm). Petals ovate, long (1.5 cm), 5 and forming a globose golden yellow, and very conspicuous corolla. Stamens 7 and staminoides 3. Pods winged, linear and glabrous with several triangular seeds.

Medicinal uses: The juice from the *Cassia alata* seeds is rubbed on skin affected by fungal infection called kayap 2-3 times a days. The leaves also effective for ringworm treatment by pounding it into powder and rub it on infected skin. The flower part is made into decoction and drink as a tonic, to expel mucous and to lessen stomach ache. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: According to Fasihuddin *et al.*, (1993), this shrub contained alkaloids, saponins, chrisposanic acid, oxymethylantara quinone, calcium oxalate, tannins and glucoside. It also contained flavonoid components as referred to phytochemical analysis result. According to (Goh *et. el.*, 1995) this shrub contained aloe-emodin, anytracumin, glycoside, cassiasida and emodin. From the phytochemical analysis result, alkaloid, saponin and flavonoid are present in the leaves of *Cassia alata*. 
Botanical name: *Citrus Limon* (L.) Burm. f. (Plate 43)

Vernacular name: Limon, Limau Rangan (Iban), Lemon, limau nipis (Malay).

Family: RUTACEAE

Habitat: A cultivated fruit tree.

Description: A small thorny shrub growing between 3 to 4 m tall, with sharp thorns, leaves simple, oblong shaped, 3 – 6 cm, medium to dark green, narrow wing widens near leaf end, stalk 1.5-3 cm long. Flowers white with 4 waxy petals. Fruits oblong to round, sometimes pointed or blunt at the tip, 7 – 12 cm x 5 –7 cm. Skin rough, warty to smooth and shiny, greenish but turn to yellow when ripe.

Medicinal uses: The fruit are crushed and the juice to be applied and massage on hair to treat dandruff problem. Decoctions from leaves are used for bathing to treat yellow fever and to reduce body temperature. According to old folks believe, hanging the twigs of *Citrus Limon* on the door way can deter out the evil spirit from entering house. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: Mitchell (1979) stated that *Citrus limon* contained essential oils (cadinene, camphene, and caryophyllene), amino acid, citric acid, ascorbic acid, caffeic acid, vitamin C, riboflavin, limonin and flavonoid components.

9 (AGM 16)

Botanical name: *Cordyline terminalis* (L.) Kunth (Plate 22)

Synonym: *Cordyline fruticosa* (L.) A. Chevalier

Vernacular name: Daun sabang (Iban), Nyiwang dayak, Lenjuang (Malay)

Family: LILIACEAE

Habitat: A cultivated herb mainly for ornamental purposes.

Description: A flower-shrub with straight stem, unbranched. Leaves simple, oblong-lanceolate to elliptic, parallel venation, 32 – 58 cm x 4 – 7 cm, colourful but mostly in red, leaf arrangement forming a rosette. Flowers come out from the sheath, in cluster. Fruit berry, yellowish, turning to red when mature.

Medicinal uses: The pounded leaves to be applied over the whole body and read with ‘magical’ wards to treat poison. Extract from the boiled leaves is drack for treating blood vomiting and diarrhoea. The leaves are pounded together with coconut oil and rub it on the stomach to ease stomach ache. According to old believes, hanging the leaflets on door can deter the evil spirits from entering the house. The roots pounded together with some juice are used to treat tuberculosis at the early stage.

Chemical constituents: *Cordyline terminalis* contained some alkaloids, flavonoids, saponins and tannins (Fasihuddin, et al., 1993).

10 (AGM 012)

Botanical name: *Melastoma malabathricum* L. (Plate 44)

Vernacular name: Batang rinsak, kemunting (Iban), Senduduk (Malay) sirugam (Bidayuh).

Family: MELASTOMATACEAE

Habitat: Common on waste-ground, open space cultivated lands and secondary forest.
Description: A perennial herb with the height of 1 – 2 m. Stem reddish with pointing scales. Leaves narrow, lance-shaped, 5 – 7.5 x 1.2 – 2.5 cm, opposite, simple with 2.5 – 7 prominent longitudinal veins, tapered to each end. Flowers clustered, short stalked, sepals 5, petals 5, pinkish colour. Fruit berry-like capsule with scales.

Medicinal uses: Pounded leaves are use as decoction to clean wound or the leaves are chewed to be applied on the cut to stop cut bleeding. The decoction from root is taken orally to treat yellow fever, prevent scars from small pox or scurf, relieving toothache and as a tonic. The leaves and young shots can be consumed directly to cure diarrhoea. A decoction from leaves is used for gargle to prevent bad breath. It was drunk ease abdominal pain and as a laxative. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: This shrub contained aliphatic alcohol (3, 2-metil-1-tritria contanol), saponins, triterpenoid and tannins (Fasihuddin, et al., 1993).

**11**

**Botanical name** : Morinda citrifolia L. (Plate 24)

**Vernacular name** : Engkudu (Iban), Mengkudu (Malay), Mikudu (Bidayuh)

**Family** : RUBIACEAE

**Habitat** : Mainly cultivated. Grows wild on lowlands, open area and secondary forest.

Description: Greyish-brown shallowly fissured bark with yellowish-red inner bark. Leaves simple, large (11 cm - 17 cm x 18 cm - 25 cm), decussate and stipulate. Stipules interpetiolar, triangular. Blade broadly elliptic to obovate, shiny, soft and fleshy, with 5-8 pairs of secondary and inconspicuous tertiary nerves. Petiole long (1 cm). Flowers white, characteristically fused into a pediceled (6 mm - 2 cm) and solitary fleshy, mulberry shaped, medium-sized (9 mm – 2.5 cm) head. Corolla salver-shaped, small (1 cm - 1.2 cm), 4 - 5 valvate lobes, hairy inside throat. Stigma bifid. The fruit is a light, greyish-green fleshy smelly syncarp, yellowish upon ripening. With black seeds.

Medicinal uses: The boiled leaves to be drink continuosly or made as a paretic to reduce the hypertention. Leaves pouded andspresd over the affected skin or fresh leaves are boiled and the juice used for patient bath. The fruits to be burned and eaten a bit to kill parasitic stomach worms, treat diabetes, coughs and swollen spleen. It also can be consumed with salt to cure asthma and stomach ache. Young leaves are crushed and made into paste to heal small cuts and abscesses. Old folks always used the pulp of the fruit for hair cleanser. A decocton of the bark is used for bathing to treat rheumatic pain. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).

Chemical constituents: According to Fasihuddin et al. (1993), Morinda citrifolia contained alizarin, asperuloside, xeronine, rubiadin, lucidin, morindon, saponins, alkaloids and flavonoids. According to Muhamad & Mustafa (1993) Morinda citrifolia contained anthraquinone, morindon, rubiadin, asperulocid and glucose, other compound is 6,8-dimethoxy-3-metilantraquinon-1-0-B-rhamnosil (4-1) glucopiranocyde, tannin dan 5,7-di-0- methylapegenino-4-0-p-D- galaetopiranoide.
Botanical name: *Physalis minima* L.


Vernacular name: Tacak Kening (Iban), Cepak, letup-letup (Malay)

Family: Solanaceae

Habitat: Grown wild on waste ground and disturbed soil, dry rice-fields, gardens and waste places.

Description: An annual herb, 20-60 cm tall, long, apically thickened hairs, stems angular above, subterete below, hollow, tinged with purple; leaves ovate to lanceolate, 1.4-6 cm x 1-5 cm, margins irregularly toothed or entire, densely hairy, petiole 1-6 cm long; flowers solitary, flowering calyx 3-5 mm long, fruiting calyx 1.5-2.5 cm long, greenish-yellow with purple ribs, corolla 5-10 mm long, up to 1 cm in diameter, pale yellow, with 5 distinct dark spots and 2 groups of rather long hairs at the throat; anthers yellow with blue margined cells; berry 8-14 mm in diameter, yellow.

Medicinal uses: According to personal communication with Aken 77 dan Raba ak Arit 58, Young leaves to be boiled and drank to cure hypertension. (Informant: Samun 85, Gendang 62, Langai 51, Tr. Donald ak Martin 48, Ipil ak Minggat 45, Suntai ak Kuai 80 and Sungki ak Juung 60). Boil the whole plant to drink as a laxative and to cure back pain personal. The decocton can be used for bath to reduce muscular strain and high blood pressure. Crush the young leaves and make it into paste for treatment of minor cuts and wounds.

Chemical constituents: This herb contained cryptoxanthin, fatty acid, pysalin and tannins according to Oliver-Bever (1986). Phytochemical analysis result showed that this plant is having some components of flavonoid.

Botanical name: *Piper betle* Bl. (Plate 35)

Vernacular name: Sirih (Iban, Malay), Baid (Bidayuh)

Family: PIPERACEAE

Habitat: A cultivated herb mainly for medicinal purposes.

Description: Herb climber, with the support of adventitious root deodepd from stem knot- smooth stem, greenish and with a girth of 4-10 mm. Fleshy leaf, alternately arrange, 5- 13 cm length, width, oval to elliptic, acuminate apex leaf, cordate shape of leaf, smooth margin, smooth leave on upper and lower, glabrous, vein founded 2.

Medicinal uses: According to personal communication with Ringkai ak Ayang 75 piper leaves chewed and read with magical word and later spit over the fainted patient and diarrhoea and taking Sirih (Informant: Ajan 80). Piper leaves are pouded and mixed with salt to be used as poultice to treate cut (telih-telih). According to Jaun ak Gobil 85, pounded leaves to be spread at the head to treat headache or migraine. Pounded leaves mixed with juice for taking a bath to cooling the body,pounded leaves mixed with edible lime (made from marine snail) and betel nut (pinang) to heated on fire and spread over itchy area (Informant: Tinjau ak Selung and Ensawy ak Untang 62). Drop the juice of leaves into ears for internal wounds of ears. A decocton from leaves is used as a lotion after childbirth. To relieve cough and asthma, place heated leaves on the chest. The young leaves mixed it with leaves of *Areca catechu*. Placed it on wounds,
ringworm spots and abscesses. Extract of the leaves normally gargled by old folks to treat mouth odour. To prevent tooth infection, eat the leaves together with fruits of Areca catechu.

**Chemical constituents:** According to Mitchell (1979), Piper betle contained essential oils (cadinene, carvacrol, cineole, eugenol, estragol, menthon, piperbetol, and caryophylene), oxalic acid and iodine. Phytochemical analysis result shows that this herb contained some components of flavonoid (Anon, 2000).

14

**Botanical name:** Piper sp.

**Vernacular name:** Sirih Kampung, Daun Pantung (Iban), Sirih Hutan (Melayu)

**Family:** PIPERACEAE

**Habitat:** A wild climbing herb on light damp area.

**Description:** Wild climber similar to Piper betle. With semi woody stem. Leaves large with cordiform shape, entire margins, and alternate spiral arrangements. Flowers with long spikes, catkin inflorescence in yellow to white.

**Medicinal uses:** *(Informant: Aken 77 and Raba ak Arit 58)* Pounded leaves and spread over affected area to treat ringworm. The crushed leaves added with some edible lime (made from merine snail) and rub it on the chest and throat to lessen cough and to ease mucous on throat. Ashes of the burnt leaves placed on skin with fungal infections.

**Chemical constituents:** The genus of Piper normally contained essential oils (Mitchell, 1979).

15 (AGM025)

**Botanical name:** Psychotria calocarpa Kurz. (Plate 29)

**Vernacular name:** Daun kerbai (Iban)

**Family:** RUBIACEAE

**Habitat:** Common on lowland forest and secondary forest.

**Description:** A small tree up to 9 m tall, leaves simple, opposite, obovate to ovate, nearly pointed at end, midrib raised on undersides. Tertiary veins inconspicuous below, turning to reddish when dried. With ovate stipules. Inflorescences terminal. Flowers with ovate lobes. Fruit globose, turning to yellow or red when ripe.

**Medicinal uses:** To treat cut/wound leaves are boiled and the extract is spread over affected wound area *(Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80 and Kumpai ak Laing 50).* Extract from the leaves is mixed with a little juice and applied to the wound area to stop bleeding. The roots are boiled to drink for rapid recovery in mothers after childbirth. The young or mature leaves either mature leaves are boiled and to be drank to treat diarrhea and the juice used for patient bath to treat fungal infections. *(Informant: Tr. Donald ak Martin 48, Ipil ak Minggat 43, Sunta ak Kiai 80 and Sungki ak Juing 60)*

**Chemical constituents:** No data available.
16

Botanical name: *Phaeanthus splendens* Miq.
Synonyms: *Phaeanthus crassipetalus* Becc., *Phaeanthus lucidus* Oliver
*Polyaltha lapadantha* Diels.
Vernacular name: Semukau, Suluh Mata (Iban, Malay)
Family: ANNONACEAE
Habitat: Primary and secondary lowland forest and freshjuice swamp, on steep slopes and especially ridges.

Description: A shrub or small tree up to 7-13 m tall, trunk up to 30 cm in diameter; leaves obovate to elliptical, 8.0-24 cm x 20-9.0 cm, the midrib with 9-13 pairs of anastomosing veins, shiny; cymes reduced to one axis; flowers solitary or together, sepals and outer petals 2 mm long.

Medicinal uses: To treat eye infection: The juice extract from young leaves added with a bit of salt and applied to the eyes infected. Other use: The bark is used for making shoulder straps and the wood is used for beams. (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Ensawy ak Untang 62, Nulik ak Rumbang 80, Sarang ak Rumbang 78, Pigit ak Nuing 50, Aken 77 and Raba ak Arit 58)

Chemical constituents: No data available.

17

Botanical name: *Carica Papaya* (Plate: 1)
Vernacular name: Rungan (Iban), Betik (Melayu)
Family: CARICACEAE
Habitat: Secondary forest next to long house.

Description: Laticiferous, small (4 m - 8 m), soft-wood, fast-growing and short lived. Large glabrous, palmatifid and palmatinerved leaves (25 cm - 55 cm) with slender petiole. Flowers pale yellow, slightly fragrant, and generally dioecious. Male flowers in long drooping panicles. Female flowers in short clusters. Ovary one-celled. Stigma sessile, 5-lobed and lacerated. Fruit: a fleshy, indehiscent, one-celled, ovoid, green and large (15 cm x 30 cm) berry. Flesh red, juicy and palatable. Seeds several, black and embedded in a sweet pulp.

Medicinal uses: A paste of the roots is rubbed over the body after childbirth. The seeds are ingested in early months of pregnancy to induce abortion. The latex is used to remove skin discolouration. The latex of the unripe fruit is a poison used for malicious purposes. The boiled leaves either root to be drink continuously or made as a paretic to reduce the hypertention. (Informant: Ringkai ak Ayang 75, Lai ak Ampuk 78, Randi ak Ugeng 57, edang ak Sigi 61, Kepitan Lee 58, Ensawy ak Untang 62, Nulik ak Rumbang 80, Sarang ak Rumbang 78, Pigit ak Nuing 50, Aken 77, Raba ak Arit 58, Suntat ak Galang 60, Empina ak Tamin 55, Kebari ak Meta 80, Kumpat ak Laing 50, Saman 85, Gendang 62, Langai 51, Tr. Donald ak Martin 48, Ipil ak Minggat 45, Sunia ak Kiai 80 and Sungki ak Juing 60).

Chemical constituents: The latex of *Carica papaya* L. contains a mixture of cysteine proteinases, chiefly represented by papain, chymopapain and papayoproteinase 92. Cysteine proteinases, which are responsible for a variety of cellular processes including
cartilage degradation in arthritis. The leave contain carpaune, which is a piperidine alkaloid that reduces cardiac activity and kills amoeba. (Wiart, 2002).

18(AGM035)
Botanical name: Blechnum orientale L. (Plate: 16)
Vernacular name: Paku Keliduk (Iban), Sirvovan (Iban, Bau), Pekuh Dungun (Iban, Sadong), Paku Kelidung (Melayu)
Family: BLECHNACEAE
Habitat: Secondary lowland forest and fresh juice swamp, on steep slopes and especially ridges.

Description:
A terrestrial or epiphytic plant; stock short bearing stipes and many spreading runners; scales on rhizome copious, narrow, thin, bearing numerous fine hairs, pale green turning to brown when old; lamina 2.5 or more long; pinnae 30 cm wide exceptionally to more than 30 cm; pinnae numerous, spreading, not lobed; fertile pinnae narrower than sterile; sori well clear at the edge of the pinna; indusia circular with a narrow sinus.

Medicinal uses: To treat abscesses--The fpounded fronds are smeared on to the effected part. Crozier are important part of the plant used in traditional medication of Iban people in curing abscesses. (Informant: Tr. Saman, 85, Gendang, 62, Langai 51, Tr. Donald ak Martin, 48, Ipil ak Minggat, 45, Sunta ak Kiai, 80, and Sungki ak Juing 60)

Chemical constituents: No data available

19
Botanical name: Zingiber officinale Rose
Vernacular name: Liak (Iban), Halia (Malay), Role (Bidayuh)
Family: ZINGIBERACEAE
Habitat: A cultivated herb mainly for medicinal purposes. Ginger is growing throughout the tropics.

Description: A stemless rhizomatous herb of the Zingiberaceae family; with fleshy rhizome (1.0 – 3 sm), branched, with bright orange to yellow within. Leaves are large, elongated and borne at the top of the non-woody underground stem, with overlapping petioles. Leaves are light green, 28-35 cm long and 9-13 cm wide with thin ellipse-shaped or elongate lance-shaped blades. The pale yellow cylindrical inflorescence 10-15 by 5-7 cm develops in the center of the leaves. It consists of curved bracts, each with at least two yellow flowers, except in the upper part, where the bracts are white or pink. Seeds are rare.

Medicinal uses: The rhizome is eaten raw as ulam with sambal belacan and in cooking as a flavouring agent. Can be eaten especially for those women after giving birth. Halia need to be pounded and mixed with kacangma, cook together with kampong chicken and mix a bit with white wine. (Informant: Numpang ak Rundu, 45) To treat the cut/wound--Rhizome need to be pounded properly and mix a bit with salt and applied on the cut for the whole day. To used at least for 3 days (rasa semeting). (Informant: Randi ak Ugeng 57, Medang ak Sigi 61, Nulik ak Rumbang 80, Sarang ak Rumbang 78 and Pigit ak Nuing 50)
Chemical constituents: This Zingiber officinale contained volatile oil-zingiberene, oleoresin - gingerol and shogaols (Chevallier, 2001).

Botanical name: Allium sativum L.
Vernacular name: Bawang Putih (Iban, Malay)
Family: LILIACEAE
Habitat: Originally from central Asia, garlic is now grown worldwide.

Description: Erect herb, up to 60 cm tall, grown as an annual from small bulbs. Roots adventitious, superficial. Bulb depressed globular to ovoid, up to 6 cm in diameter, mainly composed of 1-15 sessile lateral bulbs (clobes) which have developed from axillary buds of the younger foliage leaves; protective bulb-coat leaves papery or chartaceous, smooth, whitish or purplish; cloves ovoid to ellipsoid-oblong, each consisting of a protective cylindrical sheath, a single thickened storage leaf-sheath and a small central bud. Real stem very short, flattened, forming a disk at the base of the bulb; pseudostem formed by the sheathing bases of successive leaves. Leaves 4-10, distichous, glabrous, scattered along the pseudostem; leaf-blade linear-oblong, flat or often V-shaped in section, margin smooth or crenulate, top acute. Scape 1, up to 1.0 m long, erect, straight, solid. Inflorescence a subspherical umbel, composed of only bulblets or of bulblets and flowers, protected by a membranous spathe that splits on one side when it opens; pedicels slender. Fruit abortive, without seeds.

Medicinal uses: To treat toothache – The Garlic is pounded finally and inserted into the effected part of the tooth. For collie treatment – The garlic is heated and pounded finally then it is mix with cooking oil. The poultice is then applied on to the abdomen. (Informant: Tinjau ak Setiung 45)

Chemical constituents: This Allium sativum L. contained scordinins, selenium, volatile oil (alliin, alliinase, allicin). (Chevallier, 2001)

Botanical name: Archidendron jiringa (Jack) Nielsen (Plate: 11)
Vernacular name: Jering (Iban, Malay)
Family: LEGUMINOSAE
Habitat: Occurs in primary and secondary rain forest and in evergreen forest. A. jiringa is commonly cultivated in fields, around villages and in home gardens.

Description: Tree, up to 25 m tall with grey smooth bark, white wood and terete, glabrous branchlets. Leaves 2-pinnate, up to 26 cm long; petiole 2-5 cm long; leaflets 2-3 pairs per pinna, ovate-elliptical to oblong, 8-14 cm x 3-5 cm, opposite, chartaceous, glabrous, dark violet-red when young. Inflorescence axillary, paniculate, up to 18 cm long; flowers sessile, 4-7 together in a pseudo-umbel on a short peduncle, 5-merous, bisexual; calyx cup shaped; corolla tubular, 4-5 mm long, 5-lobed, white; stamens numerous, at base united into a tube. Fruit a legume, compressed, falcate or twisted in a wide spiral, more or less deeply lobed along the...
ventral suture between the seeds, 28-25 cm x 3-4 cm, woody, greyish and glabrous. Seeds compressed orbicular. Flowers open in the evening after dark.

**Medicinal uses:** To treat High blood and kidney problem-The fruit can be eaten or take it as an “ulam”. (*Informant: Lai ak Ampuk 78, Kepitan Lee 58, Cina Hailam Tr. Saman 85, Gendang 62 and Langai 51*).

**Chemical constituents:** No data available.

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**Botanical name:** Leonurus sibiricus L.
**Synonyms:** Leonurus japonicus Houtt. (1778), Leonurus heterophyllus Sweet (1826), Leonurus artemisia (Lour.) S.Y. Hu (1974).
**Vernacular name:** Kacangma (Iban, Malay).
**Family:** LABIATAE
**Habitat:** L. sibiricus is locally common in waste places, along river banks, railway embankments, and also as a weed in arable land. It is sometimes cultivated as an ornamental or for medicinal purpose.

**Description:** A branched annual or biennial herb, 0.5-1.0 m tall, stem 4-angled, furrowed, pubescent or glabrescent, with an unpleasant smell. Leaves decussate, lower leaves ovate or deltoid, 4-6 cm x 3-5 cm, palmately-pinnately partite or dissected, with linear incised segments, upper leaves linear, chartaceous, glabrescent above, glaucous and pubescent on the veins beneath; petiole of lower leaves 2-4 cm long, upper leaves sessile; stipules absent. Inflorescence composed of verticillasters with numerous axillary, bisexual, irregular, sessile flowers; bracts subulate, 5-9 mm long; calyx turbinate-campanulate, 4-5 mm long, in fruit 6-7 mm long. Fruit consisting of 4 dry 1-seeded schizocarpous nutlets enclosed in the persistent calyx; nutlets ellipsoid, 2 mm long, truncate at apex, smooth, brown.

**Medicinal uses:** To reduce the body temperature/post-natal treatment (buang angin) - Stem, leaves and root mix with halia’s rhizomes (*Zingiber officinale*), white wine and boil with chicken for making soup and taken 3 times a day. To treat cuts/wounds – The leaves are pounded and mixed with a bit of salt and the juice extracted can be applied directly to the wounds/cuts. (*Informant: Nulik ak Rumbang 80, Sarang ak Rumbang 78, Pigit ak Nuing 50, Tr. Saman 85, Gendang 62, Langai 51, Tr. Saman 85, Gendang 62 and Langai 51*)

**Chemical constituents:** From the phytochemical analysis result, alkaloid, saponin and flavonoid are present in the leaves of Leonurus sibiricus.

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**Botanical name:** Psidium guajava L. (Plate 10)
**Vernacular name:** Sematong/Melabah (Iban), Jambu batu (Malay), Birabas (Bidayuh)
**Family:** MYRTACEAE
**Habitat:** Psidium guajava L. is commonly cultivated in fields, around villages and in home gardens.
**Deskripsi:** Medium size tree 5-7 m tall. Smooth, light reddish, scaly outer bark, whitish cream inner bark. Simple leaf, opposite, 8-10 cm length, 4-6 cm width, dark green, rough surface, oval to oblong shape, mucronate to round apex leaf, smooth leaf margin. Swollen midrib on lower surface and sunken on upper leaf surface, intra marginal vein at leaf margin. Short petiole 4-6 cm length, greenish colour and hairy. Flower simple, head shape, axillary, calyx tube globose shaped, petal simple, stamens many, white color, 3 chamber ovary. Fruit berries, big, 4-6 cm width when mature, calyx tube permanent at fruit apex, yellow green when mature. Seed and surrounded by testa.

**Medicinal uses:** Many to treat Diarrhoea (Ubat berak langat-langat/ceret-beret) - The young and matured leaves need to be pounded and the juice extracted from the leaves could be drank. (Informant: Jaun ak Gobil 85, Tinjau ak Seliung, Ensawy ak Untang 62, Nulik ak Rumbang 80, Sarang ak Rumbang 78, Pigit ak Nuing 50, Tr.Donald ak Martin 48, Ipil ak Minggat 45, Sunta ak Kiai 80 and Sungki ak Juing 60)

**Chemical constituents:** According to Muhamad & Mustafa, 1993, *Psidium guajava* contained saponin, esscential oil as a limonene. Pirene and pinene, alkohol isopropyl, cariophyllene, oxide, isoprophyl cariophyllena oscideoleania acid, pyrena, humulene salinene and curcumene.

**Botanical name** : *Manihot esculenta* Crantz. (Plate 34)  
**Synonyms** : *Manihot utilissima* Pohl (1827)  
**Vernacular name** : Pucuk ubi, Bandung (Iban), Ubi kayu (Melayu)  
**Family** : EUPHORBIACEAE  
**Habitat**: Manihot esculenta is commanly cultivated in fields, around villages and in home gardens.

**Description:** Shrub, up to 5 m tall, all parts containing white latex and varying concentrations of cyanogenic glycosides. Seedlings form a tap-root with generally slender secondary roots; adventitious roots arising from stem cuttings, very variable in shape, size, position and number, usually 5-12 per plant, usually tapering but also long and slender, serving as a starch storage organ in the parenchymatous cells of the white, yellowish or reddish pith; storage roots are white, brownish or reddish and become lignified with age. Stems woody, unbranched to variously branched, predominantly brownish or greyish, usually with prominent leaf scars. Leaves spirally arranged, petiolate, simple; 4-28 cm long, basally attached to the blade or slightly peltate; lobes oblong, obovate, linear or lanceolate, 4-19 cm x 1-6 cm, entire, acuminate. Inflorescences are lax terminal racemes, 3-8 cm long; flowers unisexual with 5 united sepals and no petals, the pistillate basal, opening first, the staminate apical carunculate, variously marked or plain.

**Medicinal uses:** To treat stomach ache/reduce the body temperature/reduce the colic:- The pounded leaves are mixed with kerosene or cooking oil and apply to the whole body. To treat cuts/wounds – The leaves are pounded and added with a bit of salt and the extracted can be applied to the wounds/cuts directly. (Informant: Jaun ak Gobil 85, Aken 77, Raba ak Arit 58, Tr. Saman 85, Gendang 62 and Langai 51)

**Chemical constituents:** This *Manihot esculenta* Crantz contained alkaloids, namely aporphine, pyridine, indole, and tropane types (Wiart, 2002).
Botanical name: *Ocimum basilicum* L. (Plate 4)
Vernacular name: Baangkit Tual, Bunga Tual (Iban), Selasih (Malay)
Family: LABIATAE
Habitat: *Ocimum basilicum* is locally common in waste places, along river banks, railway embankments, and also as a weed in arable land. It is sometimes cultivated as an ornamental or for medicinal purpose.

Description: An erect, much-branched, annual, aromatic herb, 4-1 m tall. Stem and branches quadrangular, yellowish-green, densely white-pilose in young parts, less so when older. Leaves simple, decussate, petiolate; petiole up to 3 cm long; leaf-blade lanceolate to elliptical, 2-4 cm x 1-3 cm, cuneate at base, margin entire, apex acute, glabrous, gland-dotted on both surfaces. Inflorescence up to 14 cm long, composed of decussate, 3-flowered cymes, appearing as 6-flowered whorls (verticillasters) up to 3 cm apart. Fruit a schizocarp, glabrous.

Medicinal uses: To treat headache and to strengthen the bones especially for women after giving birth. The leaves are pounded finely and mix with *P. betel* (Sirih) and *Areca catechu* (Pinang) and the extract are used for bathing. As for bones fractures, the flower and leaves have to be mixed with cooking oil and apply it on to the part of the body. (Informant: Lai ak Ampuk 78 and Tinjau ak Seliung, 45)

Chemical constituents: This *Ocimum basilicum* L contained estragol, cineol, fenchol, linalool and methyleugenol (Wiart, 2002).

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Botanical name: *Piper nigrum* L. (Plate 17)
Vernacular name: Lada (Iban, Malay)
Family: PIPERACEAE
Habitat: *Piper nigrum* is purposely cultivated in fields, around villages and in home gardens.

Description: A perennial woody climber, 8 m long or more. In cultivation, mature plants may also appear as bushy columns, 2-5 m high and 1.25 m diameter on usually wooden supports. Root system with main roots. Orthotropic stems climbing and remaining vegetative, adhering to supports with short adventitious roots present on the nodes, internodes 4-12 cm long and 3-6 cm diameter. Leaves alternate, simple, glabrous, coriaceous; petiole 2-4 cm long; blade ovate, 8-16 cm x 4-10 cm, entire, oblique to rounded at base, tip acuminate, shiny dark green above and pale. Inflorescences appearing opposite the leaves on-lagiotropic branches flowers unisexual or bisexual without perianth. Fruits globose drupes, 4-6 mm diameter, sessile, with pulpy mesocarp, red when mature. Seeds globose, 3-4 mm in diameter.

Medicinal uses: To treat the colic – The pepper need to be read with the “jampi” and put at the end of the toes. If it is painful, the treatment is successful. (Informant: Tr. Saman 85, Gendang, 62 and Langai 51).

Chemical constituents: It contained piperidine alkaloid (Wiart, 2002).