

**A COMPARISON OF ETHNOBIOLOGICAL KNOWLEDGE
BETWEEN THE MAH MERI AND TEMUAN TRIBES IN
SELANGOR**

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**FACULTY OF SCIENCE
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SELANGOR**

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ABSTRACT

This study was conducted in 14 Orang Asli villages in Selangor, involving five Mah Meri villages and nine Temuan villages. The aims of this study were to document and compare the knowledge of natural resources' utilization as medicine, food and for spiritual purpose in the selected villages and between Mah Meri and Temuan tribes. Overall, 546 species of natural resources from 219 families, comprising of plants, mushrooms and animals were recorded. Among these, 437 species were from the wild, 98 species were cultivated or reared and 11 species were both from the wild and cultivated resources. A total number of 287 species of plants from 90 families were mentioned. From this, 166 species were used medicinally where the most commonly mentioned and used were *Eurycoma longifolia* and *Acanthus ilicifolius*, respectively. The medicinal plant species were commonly used to treat hypertension. Meanwhile, 163 species of plants were consumed with the most commonly mentioned species was *Manihot esculenta*. Only 14 species of plants were used for spiritual purpose with the most commonly mentioned and used was *Cheilocostus speciosus*. Overall, the Mah Meri and Temuan have mentioned 102 and 233 species of plants, respectively. On the other hand, a total number of 28 species of mushrooms from 14 families were recorded. From this, 14 species were used medicinally with the most commonly mentioned species were *Lignosus rhinocerotis* and *Microporus xanthopus*. *Lignosus rhinocerotis* was also the most used species medicinally. The medicinal mushroom species were commonly used to treat fever. Meanwhile 18 species of mushrooms were consumed with the most commonly mentioned were *Schizophyllum commune* and *Termitomyces heimii*. Only one species of mushroom i.e. *Amauroderma* sp. was used for spiritual purpose. Overall, the Mah Meri and Temuan have mentioned six and 27 species of mushrooms, respectively. On the other hand, a total number of 231 species of animals

from 115 families were recorded. From this, 47 species were used medicinally where the most commonly mentioned and used were *Nycticebus coucang* and *Python reticulatus*, respectively. The medicinal animal species were commonly used to treat asthma. Meanwhile, 211 species of animals were consumed with the most commonly mentioned was *Gallus domesticus*. Only eight species of animals were involved for spiritual purpose where the most commonly mentioned was *Manis javanica*. This species was also the most commonly used along with *Hystrix brachyura*. Overall, the Mah Meri and Temuan tribes have mentioned 105 and 180 species of animals, respectively. A total number of 107 species were similarly used by both tribes, involving 48 species of plants, five species of mushrooms and 54 species of animals. Low similarities of natural resources, however, were shown in all categories of utilization between tribes and villages. This was mainly due to their differences of geographical locations and vegetations. Furthermore, this also includes their reliance towards modern medicine and natural resources from the market. In addition, the lack of interest by the younger generations, dwindling numbers of natural resources, decreased number of older generations and medicine men, lack of traditional knowledge practiced and conversion of religions, also contributed to their difference of traditional knowledge.

ABSTRAK

Kajian ini telah dijalankan di 14 perkampungan Orang Asli di Selangor, melibatkan lima perkampungan kaum Mah Meri dan sembilan perkampungan kaum Temuan. Tujuan kajian ini dijalankan adalah untuk mendokumentasi dan membandingkan pengetahuan penggunaan sumber semulajadi sebagai ubat, makanan dan kegunaan spiritual di perkampungan yang terpilih dan antara kaum Mah Meri dan Temuan di Selangor. Secara keseluruhan, 546 spesies sumber semulajadi dari 219 famili yang terdiri daripada tumbuhan, cendawan dan haiwan telah direkodkan. Di antaranya, 437 spesies adalah sumber liar, 98 spesies adalah ditanam atau ditenak dan 11 spesies adalah sumber liar dan ditanam. Sebanyak 287 spesies tumbuhan dari 90 famili telah dinyatakan. Dari ini, 166 spesies digunakan sebagai ubat di mana spesies yang paling kerap dinyatakan dan digunakan adalah *Eurycoma longifolia* dan *Acanthus ilicifolius*, masing-masing. Spesies tumbuhan ubatan adalah paling kerap digunakan untuk merawat tekanan darah tinggi. Sementara itu, 163 spesies tumbuhan digunakan sebagai makanan dengan *Manihot esculenta* sebagai spesies yang paling kerap dinyatakan. Hanya 14 spesies tumbuhan yang digunakan untuk kegunaan spiritual dengan *Cheilocostus speciosus* sebagai spesies yang paling kerap dinyatakan dan digunakan. Secara keseluruhan, kaum Mah Meri dan Temuan telah menyatakan sebanyak 102 dan 233 spesies tumbuhan, masing-masing. Manakala, sebanyak 28 spesies cendawan dari 14 famili telah direkodkan. Dari ini, 14 spesies digunakan sebagai ubat dengan spesies yang paling kerap dinyatakan adalah *Lignosus rhinocerotis* dan *Microporus xanthopus*. *Lignosus rhinocerotis* juga merupakan spesies yang paling kerap digunakan sebagai ubat. Spesies cendawan ubatan adalah paling kerap digunakan untuk merawat demam. Sementara itu, 18 spesies cendawan digunakan sebagai makanan dengan spesies yang paling kerap dinyatakan adalah *Schizophyllum commune* dan *Termitomyces heimii*.

Hanya satu spesies cendawan sahaja yang digunakan untuk kegunaan spiritual iaitu *Amauroderma* sp. Secara keseluruhan, kaum Mah Meri dan Temuan telah menyatakan enam dan 27 spesies cendawan, masing-masing. Manakala, sebanyak 231 spesies haiwan dari 115 famili telah direkodkan. Dari ini, 47 spesies digunakan sebagai ubat di mana spesies yang paling kerap dinyatakan dan digunakan adalah *Nycticebus coucang* dan *Python reticulatus*, masing-masing. Spesies haiwan ubatan adalah paling kerap digunakan untuk merawat asma. Sementara itu, 211 spesies haiwan digunakan sebagai makanan dengan spesies yang paling kerap dinyatakan adalah *Gallus domesticus*. Hanya lapan spesies haiwan yang terlibat untuk kegunaan spiritual di mana spesies yang paling kerap dinyatakan adalah *Manis javanica*. Spesies ini juga adalah yang paling kerap digunakan bersama dengan *Hystrix brachyura*. Secara keseluruhan, kaum Mah Meri dan Temuan telah menyatakan sebanyak 105 dan 180 spesies haiwan, masing-masing. Sebanyak 107 spesies yang sama digunakan oleh kedua-dua kaum yang melibatkan 48 spesies tumbuhan, 5 spesies cendawan dan 54 spesies haiwan. Persamaan sumber semulajadi yang rendah walaupun bagaimanapun, ditunjukkan dalam semua kategori penggunaan antara kaum dan perkampungan. Ini terutamanya disebabkan oleh perbezaan kawasan geografi dan tumbuhan. Selain itu, ini juga termasuk kebergantungan mereka terhadap perubatan moden dan sumber semulajadi dari pasar. Tambahan lagi, kekurangan minat dari generasi muda, pengurangan sumber semulajadi, generasi tua dan pakar perubatan, kekurangan penggunaan pengetahuan tradisional dan penukaran agama juga turut menyumbang kepada perbezaan pengetahuan tradisional mereka.

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List of Abbreviations

Locations

B/ Broga Village	Broga Orang Asli Village
BL/ Bukit Lagong	Bukit Lagong Orang Asli Village
G/ Gurney Village	Gurney Orang Asli Village
HT/ Hulu Tamu	Hulu Tamu Orang Asli Village
KA/ Kolam Air	Kolam Air Orang Asli Village
KP/ Kepau Laut	Kepau Laut Orang Asli Village
KS/ Songkok Village	Songkok Orang Asli Village
SB/ Sungai Bumbun	Sungai Bumbun Orang Asli Village
SJ/ Sungai Judah	Sungai Judah Orang Asli Village
SJG/ Sungai Jang	Sungai Jang Orang Asli Village
SK/ Sungai Kurau	Sungai Kurau Orang Asli Village
SR/ Sungai Rambai	Sungai Rambai Orang Asli Village
TAR/ Tun Abdul Razak	Tun Abdul Razak Orang Asli Village
UK/ Ulu Kuang	Ulu Kuang Orang Asli Village

Tribes

TM	Temuan
MM	Mah Meri

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INTRODUCTION

The Orang Asli possessed very valuable indigenous knowledge of natural resources utilization in everyday lives. However, this knowledge is dwindling with the wave of modernization and development. Through the depletion of natural resources and lack of conservation, knowledge related to the application of natural resources became scarce and forgotten. As Selangor is one of the most urbanized states in Malaysia, studies and records of traditional knowledge by the Orang Asli need to be made as an act to conserve it before it is totally forgotten. This is especially on the Temuan and Mah Meri, being the major tribes in Selangor.

So far, there were only small numbers of ethnobiological studies conducted in Selangor. The focus of these studies were mainly on plants and mushrooms. Both resources were commonly grouped in ethnobotanical study. This study however, not only covers ethnobotanical study, but also ethnomycological and more importantly ethnozoological aspect of the Mah Meri and Temuan in Selangor.

Furthermore, this study did not only dwell on the comparison of the natural resources used by both tribes but also the effect of modernization and development sustained by these Orang Asli tribes in their life and traditional knowledge. The objectives of this study are:

- 1) to study and document the indigenous knowledge of plants, mushrooms and animals utilized by the Mah Meri and Temuan tribes in selected villages in Selangor
- 2) to compare the utilization of plants, mushrooms and animals as medicine, food and for spiritual purpose in the selected villages and between Mah Meri and Temuan tribes in Selangor

LITERATURE REVIEW

2.1 Ethnobiology

The word “ethno” in ethnobiology was defined as nation, people or culture by Shorter Oxford English Dictionary. It was derived from a Greek word, “ethnos” meaning nation (Trumble & Stevenson, 2002). Winick (1977) meanwhile stated, “ethnos” means “a group of people, linked by both nationality and race”. The prefix “ethno-” was introduced through the works of Conklin and Frake in 1957 and 1962, respectively. It was roughly related to the study of interpretation concerning a group of people from their standpoint (Sutton & Anderson, 2004). However, this prefix may have been introduced much earlier through the introduction of the discipline *ethnographia* or *Ethnographie* from 1760s to 1780s and; the terms *ethnologia* by Kollár in 1783 and *ethnologie* by Chavannes in 1787 (Vermeulen, 1996).

Ethnobiology was summarized by Cotton (1996) as “the relationships between traditional societies and the natural world, in extant cultures and reflected in the archaeological record”. He points that this study comprised of ethnobotany, ethnomycology, ethnozoology, ethnoentomology and ethnominerology. These studies are further branched into ethnotaxonomy, ethnomedicine, subsistence economy, material culture and ethnoecology. When ethnobiological study combined with ethnoastronomy, it formed “ethnoscience study” (Cotton, 1996). In general, ethnoscience study covers the relationships of the indigenous community with all the elements of environment (Cotton, 1996; Sutton & Anderson, 2004; Trumble & Stevenson, 2002).

Several other definitions of ethnobiology includes Sutton and Anderson (2004), as the past and present knowledge, usage and classification of the environment (biotic). While Hunn (2007), as “the study of the role of plants and animals in the lives of the

“primitive people” ”. Unlike Cotton (1996), Hunn (2007) and; Sutton and Anderson (2004), exclude mushroom species (ethnomycology) from the branch of ethnobiological studies.

Formerly, there were three phases of ethnobiological studies development stated by Clément in 1998 that was later updated to four phases (Hunn, 2007). The first phase consists of the documentation of natural resources utilization profitable to the Western scientists and readers. The second phase detailed documentation especially on the utilization and languages (i.e. ethnoscience). The third concerns the broader perception of knowledge that includes the environment of the indigenous group involved (i.e. ethnoecology). The fourth phase i.e. indigenous ethnobiology, is conducting the documentation of traditional knowledge while upholding moral responsibilities by the scientists, so as not to conduct an act of “stealing” their “intellectual knowledge” (Hunn, 2007).

In this study, only three disciplines from ethnobiology are discussed namely ethnobotany, ethnomycology and ethnozoology.

2.1.1 Ethnobotany

The study of ethnobotany has been in existence and applied long before the term was coined. It was described by Jain (1994) as “...the best word to define the experience of the first human, who observed birds and animals and tested leaves, fruits and tubers for their ability to satisfy hunger or heal wounds...”.

The term ethnobotany was first introduced by Harshberger in 1895 as “the plants used by primitive and aboriginal people” (Young, 2007). Since then, numerous versions of ethnobotany’s definitions have arisen. Cotton (1996) for example described ethnobotany as “the mutual relationships between plants and traditional peoples”. Schultes (1994) meanwhile defined the term as “the study of the uses of plants in

primitive societies in both modern and ancient times”. Sutton and Anderson (2004) on the other hand, as “the native classification and use of plants”. All of these definitions boil down to the relationship between human and plants. Today, the study of ethnobotany has broadened in its field and definition. Farnsworth (1994) for instance referred ethnobotany as “the study of plants by humans including for foods, building materials, medicines and other economic applications”.

Extensive works have been done for these past centuries on this field. This is particularly with the contribution of traditional medicinal knowledge to the Western or modern medicine (Lozoya, 1994; Prance, 1994). The famous examples are aspirin from *Filipendula ulmaria* as painkiller and anti-inflammatory; and quinine extracted from *Cinchona pubescens* bark in treating malarial fever (Cox, 1994). However, in certain cases, the active chemical compounds in plants may found to be more suitable for other ailments than the one treated by the indigenous people (Prance, 1994).

2.1.2 Ethnomycology

The introduction of the subject ethnomycology was credited to Dr. R. Gordon Wasson and Valentina Pavlovna in their book entitled *Mushrooms, Russia and History*, by Schultes and von Reis (1995). The word ethnomycology was defined by Wasson (as cited in Singh, 1999) as “the study of fungi in folklore and rituals, from prehistoric times to present day”, in his book *Soma, Divine Mushroom of Immortality*. Today, ethnomycology was defined e.g. by Lee and Chang (2007) as the relationship between mushrooms and humans. Charaya and Mehrotra (1999) meanwhile defined the term as the utilization of mushrooms in cultures around the world involving the empirical experiences of societies from generations of fungi utilisation. Schultes and von Reis (1995) on the other hand, defined ethnomycology as “the study of fungi and their use

and influence in the development of cultures, religion and mythology”. They also mentioned that this field of study is the youngest in the branch of ethnobotanical study.

Originally, the subject of interest related to ethnomycology comes from the utilization of hallucinogenic fungi in sacred religious ceremonies specifically held by the Indians in Mexico (Lee & Chang, 2007; Schultes & von Reis, 1995). Lee and Chang (2007) also suggested that the study of ethnomycology may have derived from the infusion between the studies of mycology and anthropology.

2.1.3 Ethnozoology

The term ethnozoology was introduced by Mason in 1899, as “zoology in the region as it is recounted by the savage” in *The Ray Collection from Hupa Reservation* (Clément, 1998). The term was later defined by Overall in 1990 as “the knowledge of, use of, and significance of animals in indigenous and folk societies” (Sutton & Anderson, 2004). Meanwhile *Henderson’s Dictionary of Biology* defined it as the study of animal utilization by humans (Lawrence, 2008). Ethnozoology however has not been explored as broadly as ethnobotany. This discipline may have been originated from the beliefs of indigenous peoples of good or bad omened animal species and tabooed species. Tabooed species were believed to bring them sickness from consuming. Thus, they were prohibited especially for pregnant women or after childbirth since it may harm the child and the mother (Evans, 1923).

These three disciplines of ethnobiology are explored in this study in terms of their utilization for medicines, food and spiritual purpose by the Orang Asli in the selected villages.

2.2 Orang Asli in Malaysia

Orang Asli is the aborigines found in Peninsular Malaysia. In Malay language, the word '*orang*' means people while '*asli*' means original, hence the aboriginal people (Hamilton, 2005). The 2008 census carried out by the Department of Orang Asli Development or *Jabatan Kemajuan Orang Asli* (JAKOA) recorded the total number of Orang Asli in Peninsular Malaysia as 141,230 persons. This number covers about 0.5 % from 27.73 million of the Malaysian total population in 2008 (Department of Statistic Malaysia, 2009). Out of this number, 79,156 persons were from the Senoi (56.05 %), 58,403 persons from the Proto-Malays (41.35 %) and 3,671 persons from Negritos ethnicity (2.60 %) (Jabatan Kemajuan Orang Asli [JAKOA], 2008). Among the states in Peninsular Malaysia, Pahang has the largest population of Orang Asli with 50,792 persons. This was followed by Perak with 42,841 persons and Selangor with 15,210 persons. JAKOA has also determined the total number of Orang Asli villages in Peninsular Malaysia as 852. They were headed by 590 *Penghulu* or *Batin* (JAKOA, 2008).

Orang Asli have migrated from several places to Peninsular Malaysia (previously named Malay Peninsula) as early as 10,000 years ago. Orang Asli can be divided into three different ethnics namely the Negritos, Proto-Malays and Senoi based on their physical appearances, cultures and languages. The waves that brought the migration of the aborigines to Peninsular Malaysia started with the Negritos around seven to ten thousand years ago (Mohd Fauzi & Nor Aini, 2009). This was followed by the Senoi around six to eight thousand years ago and the Proto-Malays about four thousand years ago. Nevertheless, the records supporting this statements are still lacking (Carey, 1976; Jimin, as cited in Mohd Fauzi & Nor Aini, 2009). Hamilton (2005), however, argued that archaeological and linguistic findings shows that the Orang Asli were the earliest people originated from this region and not migrated from somewhere else. She also added that with the migration of Austronesian people later on, they were

forced to inhabit the deepest parts of the jungle. Whether they are the original inhabitants or migrants to the region, it is for certain that they have been here long before the arrivals of the Malays in Peninsular Malaysia (Chin, Hawk & O'Neil, 1997).

Generally, the Orang Asli is known to inhabit the deepest forests or mountainous regions (Chin *et al.*, 1997; Evans, 1923; Williams-Hunt, 1952). Nevertheless, there were several tribes of Orang Asli back then who lived in the lowland jungles, in swampy areas known as *Orang Laut* (Williams-Hunt, 1952). However, this setting has changed since the forced resettlement programme. This programme was conducted by the government back in the days in order to weaken the communist movement in the Malay Peninsula. Hence, the Orang Asli inhabiting the jungle areas were forced to move into open areas where the heat and conditions were unsuitable for them. These situations caused a number of deaths especially among the elderly folks (Hamilton, 2005; Noone, 1972).

The Orang Asli conversed mainly in two major languages, the Austronesian and Austroasiatic (or Mon-Khmer or Central Aslian) languages (Chin *et al.*, 1997). The origin of Austronesian language was said to be from southern China about 6,000 years ago (Bellwood, as cited in King & Wilder, 2003). While the Austroasiatic (now termed as Aslian), might have been related with the aborigines in Burma, Thailand and Indochina (Nicholas, 1996).

Before the term Orang Asli was utilized, there were many terms used in referring to them. For example, the Pagan Tribes by Evans (1923), *Orang Darat* by Williams-Hunt (1952) and *Orang-Utan* or “forest people” by Schebesta (1973). However, the term *Sakai* seems to cause dissatisfaction among Orang Asli. Williams-Hunt (1952) pointed out that the term brings derogatory meaning as “serf or an inferior person”. This definition was the opposite of the aborigines living in the hills area since they were the most non-dependant aborigines and that they would prefer the name

Orang Darat back then (Williams-Hunt, 1952). Schebesta (1973) meanwhile stated that the term *Orang-Utan* or “forest people”, which he preferred refers to their fondness of the jungle.

2.2.1 Negritos

The Negritos were said to be among the earliest group of people where some literature coined them as “the most primitive cultures on earth” (Benjamin, 1973). Others claimed that the Negritos had settled in Peninsular Malaysia around 25,000 years ago although there were no sufficient documents in supporting this (Carey, 1976; Jimin, as cited in Mohd Fauzi & Nor Aini, 2009). Evans (1923) likewise suggested the Negritos are the “oldest inhabitants of the country”. The first record on the Negritos was written in 1600 by John Smith. He mentioned that the Semang (early name for Negritos) was the original owner’s of the Patani, however, they were mere savages (Hale, 1909).

According to Hamilton (2005), the name Negritos was introduced by the Malay government. It represents their physical appearance that is similar to the Negroes of Africa. However, in some literature, the word *Semang* is used in identifying the Negritos (Chin *et al.*, 1997; Hamilton, 2005). Chin *et al.* (1997) stated, the term *semang* suggested a “derogatory expression”. This might refer to the second definition of the word *semang* stated in Kamus Dewan i.e. “contracted to work because of being indebted to them (monetarily), etc.” (Iskandar, 1970). Carey (1976) pointed out that this portrayed them as “debt-slaves”, which caused uneasiness to the ethnic people themselves. Additionally however, the first definition of the word *semang* in Kamus Dewan, “an indigenous tribe in Malay Peninsula or *Pangan*”, does not satisfactorily portray the ethnic people, either (Carey, 1976; Iskandar, 1970). Furthermore, the name “*Pangan*” had already been referred to the instead Proto-Malays during that time (Williams-Hunt, as cited in Carey, 1976). Skeat and Blagden (1906b) on the other hand,

explained that the name “*Semang*” was used in referring to the Negritos in the West Coast of the Malay Peninsula while “*Pangan*” is for the East Coast. This was agreed by Carey (1976) whom stated that the term “*Semang*” was used in Perak and Pahang. Meanwhile the word “*Pangan*” in Kelantan, was used as a derogatory term. Endicott (1979) explained that the term “*Pangan*” in Kelantan meant “people who are like animals, who are stupid and who eat their food raw”. This was argued by Razha (1995) where he stated that the term “*Pangan*” in the dialect of Kelantan meant “jungle”.

The Negritos’ physical characteristics are similar to the East African people, which brings about the name Negritos, meaning Little Negro (Carey, 1976). Generally, they can be identified with their woolly locks, dark skinned tone, small stature, broad nose and low cheekbones (Carey, 1976; Evans, 1923). Previous studies suggested that the Negritos of the Malay Peninsula are related to the *Aetas* of the Philippines and *Mincopies* of Andaman Islands (Evans, 1923; Man, 1975). This fit with studies by Sawyer (1900), Kroeber (1928) and Carey (1976) who stated that the Negritos can be found in a number of places around Asia. This includes the Philippines, Ceylon, Southern India, Andaman Islands, Malay Peninsula and New Guinea.

The Negritos can be divided into six tribes, namely the Kintak, Kensiu, Jahai, Mendriq, Bateq and Lanoh. Once, the Negritos were recorded to be found around north to northeast of the Malay Peninsula from Chaiya in Thailand to Kedah, parts of Perak, Pahang, Terengganu and Kelantan (Evans, 1937; Noone, 1972; Skeat & Blagden, 1906b). Now, the Negritos can be found in all states in Peninsular Malaysia except in Melaka and Negeri Sembilan. The word ‘found’ is not exactly correct in Johor and Selangor, since there is only one and three persons of Negritos ethnicity in these states, respectively (JAKOA, 2008). This could possibly be due to intermarriage or work.

The Negritos were known to be nomadic (Carey, 1976; Mohd Fauzi & Nor Aini, 2009; Noone, 1972; Schebesta, 1973; Skeat & Blagden, 1906b). Some led a semi-

nomadic life such as Jahai and Lanoh tribes (Nicholas, 1996). They practiced hunting and gathering activity (Chin *et al.*, 1997). Some tribe, such as the Bateq, residing in the Kuala Koh National Park, Gua Musang, Kelantan still retained their way of life through hunting without causing a threat to the ecosystem (Mohd Naim, 2011). Chin *et al.* (1997) claimed that the language that the Negritos used is related with the Austroasiatic or Aslian language group. Nicholas (1996) suggested that this shows their relativity with the aborigines in Burma, Thailand and Indochina.

2.2.2 Senoi

The definition of the word Senoi came from a Temiar word meaning “man” or “mankind” (Carey, as cited in Carey, 1976; Williams-Hunt, 1952). Before the name Senoi was used, this group of people were called “*Sakai*”, meaning “slave” (Chin *et al.*, 1997; Mohd Fauzi & Nor Aini, 2009). This was also mentioned by Noone (1972) and Parkin (1991) whom stated that the word *Sakai* meant “slave or dependant”. Parkin (1991) added that the word *Sakai* most probably originated from a Thai word. Couillard in *Les Malais et les Sakai: Quelques Reflections sur les Rapports Sociaux dans la Peninsule Malaise* (Malays and Sakai: some reflections on social reports in the Malay Peninsula) (as cited in Jumper, 2001) and Jumper (as cited in Nowak, 2004) however stated otherwise. They suggested that the word “Sakai” might be derived from a Sanskrit word meaning “companion” or “ally”. Nevertheless, locally when people other than the Orang Asli uttered the word, it is considered as offensive. Thus, JAKOA themselves has taken to disapprove its use (Dentan, 2003). Hence, the name “*Sakai*” was changed to Senoi by the Malay administration, in order to avoid further discomforts especially among the indigenous in the group (Carey, 1976).

The word *Senoi* most possibly was introduced (especially in academic literature) by Noone in *Report on the Settlements and Welfare of the Ple-Temiar Senoi*. The

physical characteristics of the Senoi group consist of wavy black hair with brown or reddish tint, light-coloured skin with Mongoloid features and; slim-built with strong and well developed bodies (Carey, 1976; Noone, 1972; Williams-Hunt, 1952).

The theories of the Senoi group's origins are varied. One of them was stated by Schmidt in *Bijdragen* (as cited in Skeat & Blagden, 1906b). He stated that the Senoi were from Mon-Annam (Mon-Khmer) origin. This was due to the language that the Senoi used came from Mon-Annam family language i.e. Austroasiatic or Aslian language. This was agreed by Skeat and Blagden (1906b). Furthermore, they added that this language has long been used as a prime language in the Central and Southern Indo-China before the arrivals of Burmese and Siamese from the north (Skeat & Blagden, 1906b).

Another theory was introduced by Virchow (as cited in Skeat & Blagden, 1906b). He stated that the Senoi was connected with the Vedda, Tamil, Korumba and Australian races. This was in terms of their racial affinities, e.g. height, skull-character, skin colour and hair-character (Skeat & Blagden, 1906b). Carey (1976) argued that the first theory was more probable given the location of Peninsular Malaysia with both Cambodia and Vietnam (areas of Mon-Khmer origin) in comparison with either Ceylon or Australia. He added that in terms of physical attributes, the indigenous in Cambodia and Vietnam holds more similarities compared to the Australian aborigines. Evans (1937) stated that although some elements of Austroloid features are present in the Senoi, the ethnic was probably more closely related with the "Indonesian" tribes of French Indo-China (Vietnam and Cambodia region).

The Senoi could be found in all states in Peninsular Malaysia except in Kedah. According to Jimin (as cited in Mohd Fauzi & Nor Aini, 2009), the Senoi built their settlements commonly in hill areas from 4,000 to 7,000 feet from sea level. Generally, they could be found on the remote and hilly areas especially on the central mountains

between Pahang and Perak (Chin *et al.*, 1997; Evans, 1923, 1937). Some tribes such as the Mah Meri, however, could be found living in the coastal areas (Carey, 1976; Hamilton, 2005).

The Senoi could be divided into six tribes namely the Temiar, Semai, Semoq Beri, Che Wong, Jah Hut and Mah Meri. According to Noone (1972), the Senoi was once believed to be made of two tribes, the Temiar and Semai. The reason might be the great number of peoples in both tribes in comparison to others in the ethnicity. From the Orang Asli census in 2008, the Semai and Temiar still show dominant populations among the Senoi and Orang Asli in Malaysia with 42,383 and 24,908 peoples, respectively (JAKOA, 2008). The Semai people are more centralized in Pahang and Perak, while the Temiar in Kelantan and Pahang.

The Senoi was known to be nomadic (Skeat & Blagden, 1906b), but they have been living as permanent settlers nowadays (Carey, 1976). They practiced shifting cultivation, dry rice-swidden agriculture, fishing, hunting and gathering; cash economy and works in government or private sector (Carey, 1976; Chin *et al.*, 1997; Hamilton, 2005; Nicholas, 1996).

2.2.3 Proto-Malays

The Proto-Malays had always been closely related with Malays, mainly for their resemblance in terms of physical and facial features (Noone, 1972; Skeat & Blagden, 1906b; Williams-Hunt, 1952). Generally, they can be described as having dark skin, slightly wavy, straight, or lank hair; with Polynesian features and heavily built body frame (Carey, 1976; Noone, 1972; Williams-Hunt, 1952). There were many terms used before the name Proto-Malays was made official. Among them were Pagan Malay, Jakun and Aboriginal Malay (Evans, 1923; Schebesta, 1973; Skeat & Blagden, 1906b; Williams-Hunt, 1952). According to Mohd Fauzi and Nor Aini (2009), the Proto-Malay

speaks using the Austronesian language. The same language dialect as the Malays. Hamilton (2005) suggested that this points out that the Proto-Malays may have the same ancestors as the Malays. In addition, their early arrivals on the Peninsular Malaysia than the Malays might have sparked the term Proto-Malays, meaning “*Orang Melayu Asli*” or “aboriginal Malays” (Carey, 1976; Evans, 1923; Hamilton, 2005). This term solved the dissatisfaction with the term “Jakun”, meaning “savages” or “wild” or “pagan” or “heathen Malay” (Carey, 1976). However, one of the tribes among the Proto-Malays ethnicity still retained the name “Jakun” till today (Mohd Fauzi & Nor Aini, 2009).

There are many theories regarding the origins of the Proto-Malays. Nicholas (1996), for instance stated that the Proto-Malays migrated from Indonesia. While Skeat and Blagden (1906b), on the other hand suggested a Pan-Negrito theory where the Proto-Malays was a mixture of both Malays and Negritos. Meanwhile, Favre and Crawford (as cited in Skeat & Blagden, 1906b) points out that the Proto-Malays (whom they called *Benua* – believed to be living in the peninsula before the arrivals of the Malays) was the people who did not convert to Islam (during the trading years with the Arab merchants) and settled in the jungle to avoid conversion. However, Moorhead (as cited in Mohd Fauzi & Nor Aini, 2009) believed that they actually descended from the Tibet-Mongolian people. This might hold some truth as the language that they used was from Austronesian language group, which was said to be originated from southern China about 6,000 years ago (Bellwood, as cited in King & Wilder, 2003). Carey (1976), however, mentioned that this language differed from the Semelai and Temoq dialects, which consisted of Aslian (Austroasiatic) language groups. He believed that this was the result of intermixing with the Senoi. Skeat and Blagden (1906b) also mentioned that the tribes in the Proto-Malays consist of admixture between either with the Senoi or Negritos, and true Proto-Malays.

Intermixture among the Orang Asli ethnicities was also reported in Evans (1923). He mentioned of encountering a village where the villagers have mixed physical features between the Negritos and Jakun (Proto-Malays) but conversing in the dialect of Sakai (Senoi). Another example was the Semoq Beri tribe, which was noted to be of Negritos and Senoi although it was classified under the Senoi ethnicity (Carey, 1976; JAKOA, 2008; Razha, 1995).

Since the physical features might caused confusion to the tribes' ethnicity – owing to the admixture between them, Carey (1976) suggested by categorizing the Proto-Malays in three categories using the languages that they used. The first group was the pure Malay (the people who conversed in Malay language only, such as the Temuan). The second group was partly Senoi like the Semelai. The third group was the people who converse using Sumatran language in the west coast of Johor (most probably Orang Kuala and Orang Seletar).

Today the Proto-Malays are divided into six tribes, namely the Temuan, Semelai, Jakun, Orang Kanaq, Orang Kuala and Orang Seletar. The Proto-Malays are distributed in all states in Peninsular Malaysia except in Kedah. They were once known to inhabit the southern part of the peninsular (Carey, 1976; Skeat & Blagden, 1906b). The Proto-Malays led semi-nomadic life and permanent settlers. Their economic activities varied from shifting cultivation, collecting jungle products, agricultural activity (permanent), wage labours and fishing (Carey, 1976; Nicholas, 1996).

2.3 Orang Asli in Selangor

According to the census carried out by JAKOA in 2008, all of the three Orang Asli ethnics could be found in Selangor. The Temuan tribe from the ethnic Proto-Malays shows the highest number of population with 10,200 persons. They are followed by the Mah Meri and Semai (both from the Senoi ethnicity) with 3,647 and 669 persons,

respectively (Table 2.1). There were 73 Orang Asli villages in Selangor where 69 of them were located in suburban areas and four in the urban areas. Their monthly income roughly ranged from RM 420.00 to RM 660.00. Most of the Orang Asli in Selangor are animists with 1,140 persons, followed by other religion with 1,174 persons, Muslim 628, atheist 238, Christian 147, Buddhist 18, Hindu 11 and Bahai 2 persons (JAKOA, 2008).

Table 2.1: Population of Orang Asli in Selangor according to tribe and ethnic groups in 2008

Ethnic	Tribe	Population	Total number
Negritos	Kensiu	0	3
	Kintak	0	
	Lanoh	0	
	Jahai	0	
	Mendriq	3	
	Bateq	0	
Senoi	Temiar	275	4651
	Semai	669	
	Semoq Beri	7	
	Che Wong	8	
	Jah Hut	45	
	Mah Meri	3,647	
Proto-Malays	Temuan	10,200	10556
	Semelai	154	
	Jakun	155	
	Orang Kanaq	0	
	Orang Kuala	47	
	Orang Seletar	0	
Total Population		15210	

(Source: Jabatan Kemajuan Orang Asli (JAKOA), 2008)

Other than Selangor, the Temuan could also be found in Johor, Kelantan, Melaka, Perak, Pahang and Negeri Sembilan (second largest community next to Selangor) (JAKOA, 2008). The physical features of Temuan are very similar to the Malays. Among the Orang Asli tribes, the Temuan could be found living closest to the Malay and Chinese villages. Their sources of income vary according to their

settlements. Generally, they are involved in rubber tapping, collecting forest products and working in government or private sectors. The Temuan was once involved in wet rice agriculture and hunting (Carey, 1976). However, both had not been practiced anymore with insufficient land and animal species left in the forest.

According to the Temuan beliefs, the original place of humankind is *Gunung Raja*, which bordered between Selangor and Pahang. The word *temuan* was derived from the word *temu*, meaning meet (Antares, 2006). One version of the Temuan's origin was told by Batin Endek Anak Lapan in Bukit Tampoi. He mentioned that the Temuan originated from the royals and nobles of Pagar Ruyung, Sumatera. The migration happened during the arrival of Islam there. Since they refuse to be islamised, three nobles namely Batin Perah Galung, Batin Canggih Besi and Batin Tok Pengau migrated with their families to Belayar (Malay Peninsula or *Tanah Melayu*'s original name – due to their travelling method via sailing or *belayar*). The three nobles left their siblings to become royals at river estuary while they ventured into the forest to find new settlements. They believed the Malays descended from the siblings of these three nobles. Thus, marriages between Malays and Temuan is not encouraged (Ahmad, 1984).

The Mah Meri meanwhile could also be found in small numbers in Johor, Kedah, Negeri Sembilan, Pahang and Perak. This was probably through intermarriage or work (JAKOA, 2008). They were once classified in Jakun (Proto-Malay) group (Skeat & Blagden, 1906b) and identified as mixed origin between Sakai (Senoi) and Jakun (Proto-Malay) group (Evans, 1923). This was based on the observation of their physical affinities and similarities. However, it could not be ascertained whether they are of mixed origin. Despite their physical affinities, DNA testing should be carried out as well before final remarks of their origin could be made. Carey (1976) mentioned that the Mah Meri speak of Senoi language while at the same time practiced the social and

culture similar to the Proto-Malay. He deduced that this could probably be due to the adaptation transpired to the tribe.

The Mah Meri was once known as *Besisi* meaning “men” or “humankind”. This term was later changed to Mah Meri, meaning “people of the forest” (Carey, 1976). As noted by Carey (1976), besides referring to the tribe, *Besisi*’ also represents the language used by the Mah Meri. The word *mah meri* in *Besisi*’ language in fact referred to the aborigines in general and not specifically to one tribe, only (Carey, 1976).

The Mah Meri’s origin came from an incestuous relationship between a brother and sister (the only humankind at that time). From then, they grew into a tribe known as the Mah Meri today. The Mah Meri was said to come from Pahang area, before the sea water level decreased as to where it is now. Their arrival and settlement in Selangor was due to their encounter with the Malays, forcing them to retreat and settled in *Telo’ Gunjeng* (previous name for Carey Island) (Wazir Jahan, 1995). However, according to Carey (1976) and Werner (1974), the Mah Meri came from a place close to Endau, which bordered between northern Johor and Pahang. They migrated to the west coast of Peninsular Malaysia as their ancestors decided to obtain more catch (fish). In another version from Sungai Bumbun Orang Asli Village, the Mah Meri said that their ancestors have migrated to their present settlements from the south. This could either be Johor, Singapore or the neighbouring islands in the south (Werner, 1974). Although known as fishermen tribe, some practiced coastal fishing involving trapping crabs and collecting bivalves. Nevertheless, many works in oil palm and coconut palm estates while some in private or government sectors.

The Semai could also be found in Johor, Kelantan, Melaka, Negeri Sembilan, Pahang, Perak, Selangor and Terengganu (JAKOA, 2008). Notable work by Dentan (1968) provides some valuable insights on the Semai. He mentioned that the tribe

comprised of West Semai and East Semai although there was also Semai tribe settled in Cameron Highland. In terms of their origin, according to Dentan (1968) the Semai could not remember where they were originated from. They could only remember that they had always been there (in Peninsular Malaysia). The Semai was known to be hill people. They practiced swidden-farming and lived from jungle produce (hunter-gatherer) back in the days (Carey, 1976; Dentan, 1968; Fix, 1975). Nowadays some works in estates and some as labourers in several governmental departments (Carey, 1976).

2.4 Ethnobiological Studies on Orang Asli in Selangor

Various fields of studies have been conducted over the years on the Orang Asli in Selangor. This ranges from ethnography, demography, biomedicine, ethnobiology, ethnobotany, linguistic (phonology), health, dental, anthropology and so on. As of today, the total number of literatures on Orang Asli in Selangor could be estimated at about 233 literatures (Baer, 2010; Lye, 2001). Almost all of the literature covers on either the Temuan or Mah Meri. In majority, it focuses on health, ethnography, anthropology, phonology, islamisation and even the handicraft of Orang Asli (e.g. woodwork, especially by the Mah Meri in Carey Island). Only a handful, however, relates to ethnobiological studies.

Examples of ethnobiological works on Orang Asli in Selangor can be seen from Noor Zaharah (2003) and Ong (1986). Nor Zaharah's work in 2003 entitled *Nilai kepelbagaian biologi terhadap Orang Asli suku kaum Temuan Hulu Kemensah, Hulu Kelang, Selangor* (Biodiversity Values of Orang Asli Temuan Hulu Kemensah, Hulu Kelang, Selangor). She categorized the biological resources into direct and indirect values. The direct values were divided into two: productive and consumptive utilization. Productive utilization of biological resources consists of aesthetic and ornamental;

medicinal and aromatic; and economic benefits. Consumptive utilization meanwhile was the use of biological resources for personal needs and foods. She also found that the Temuan villagers practiced the activities of replanting two species of plants namely *Pokok mengkuang* or screwpine leaves (*Pandanus* sp.) and *Rotan manau* (*Calamus manan*). Two species of plant on the other hand were massively exploited (*Tongkat ali* or *Eurycoma longifolia* and *Kacip fatimah* or *Labisia pumila*) and commercialized for health benefit. However, she found that *E. longifolia* was still abundant in the Kemensah forested area.

The ethnobiological study conducted by Ong (1986) in Kampung Padang, Ulu Langat, Selangor meanwhile recorded various utilizations of plants, animals and mushrooms by the Temuan. His study includes the customs and beliefs, magico-religious, traditional medicine, food, spiritual, building materials, daily utilization crafts (such as baskets and containers), pesticides and so forth on the tribe. Some of the species were avoided from contact and were not consumed. These species could cause itchiness, fatality, insanity or related with spiritual and beliefs. For example, a species believed to have a spirit living in it (such as owls) or claims of poisonous species (probably) judging from its appearances or its source of food (such as crows).

The most extensive ethnobiological branch studied in Selangor and in Malaysia is ethnobotany. Stone (as cited in Kamarudin & Latiff, 2002) mentioned that modern ethnobotany was introduced during the Portugese invasion in 1511. Ethnobotanical studies among the Orang Asli in Selangor have been done by several authors in the past years.

For example, Suharti (2005) has conducted a study on the plants used by the Temuan in Kampung Batu 16, Gombak, Selangor for aphrodisiac. Eight plant species from eight families was identified. These species were tested for its alkaloids, saponins, steroids or triterpenoids compound. She mentioned that a saponin steroid compound

was related with sex hormones. It was not stated whether its effect is to induce or resemble sex hormones. *Dillenia reticulata* was the only species that did not show any chemical constituent (alkaloids, saponins, steroids and triterpenoids) through the phytochemical tests conducted.

Rosnah (1982) on the other hand compared the plants used by the Temuan in Kampung Orang Asli Batu 16, Gombak and Kampung Orang Asli Kuala Pangson, Hulu Langat. She reported that the plants were used for various purposes including instruments, technology, ornaments, clothing, food, medicines and others. The information regarding medicinal utilization of the plants was obtained mostly from Kampung Orang Asli Kuala Pangson, Hulu Langat. She stated that the exposure of “modern” food caused less reliability towards natural resources for foods from the wild. This affects the introduction of traditional knowledge to younger generations. The exposure towards modernization caused the acceptance of urbanization instead of maintaining the natural resource areas that the Orang Asli possessed. This was seen by little worries were shown from the land clearing activities for government projects.

Plant evaluation studies on Orang Asli communities meanwhile were done by Nur Awanis (2009), Norfaizah (2009), Fatin Nuraini (2009) and Nur Syuhanis (2009). The plants that the communities used were evaluated based on its market demand, price and the conservation status of each species. Among the species that they have recorded, three species were classified as endangered i.e. *E. longifolia*, *L. pumila* and *C. manan*. The plant species were used for a number of purposes such as beliefs and customs, ceremonies, crafts, hunting gears, building materials and so on. In majority, the plants were used as either food, medicine, or both. Most of the resources were used for personal purposes and only small numbers were sold as a means of generating additional income. This was probably due to the limited number of resources and seasonality of certain species. Thus, it can provide for one household only. The plant

species that they have recorded were either wild or cultivated. Nur Syuhani (2009) estimated that the values of commercialized plants used by the Orang Asli community in Kampung Batu 16, Gombak was about RM40,030.00. This estimation was made based on the market price of the resources. They stated that the values of plants fluctuate with the availability of the resources. The activity of gathering forest product involved the older generations only since most of the younger generations worked in government or private sectors.

An ethnoecological study on the other hand was conducted on the Temuan in Kampung Paya Lebar, Hulu Langat, Selangor by Stephenson (1977). Ethnoecological study is the diffusion between ethnobiological and ethnobotanical study according to Alcorn, Bye, Denevan and Padoch; and Posey (as cited in Davis, 1995). This is very different from Martin (1995), as he stated that ethnoecology comprised of ethnobiology, ethnozoology, ethnobotany and ethnoentomology. The study by Stephenson (1977) relates the environment surrounding the Temuan community. This includes the hills, lands, water bodies, stars, weather, moon, plants and animals, significant in their culture. The plant names were designated according to its use, morphology and habit. These made them easier to recall as the traditional knowledge was transferred orally. The plants were used in majority as food (wild and cultivated sources), medicine, magico-religious, building materials, tools, utensils, firewood, economy and in their everyday lives. The Temuan generated their income through selling forest products. The crafts and materials that they have made however were for personal use only. The mushrooms and mosses were lumped in general categories known as *kulat* and *lumut* respectively since the lack of utilization by the Temuan. The animals meanwhile were believed to be of living things without souls, mainly used as foods. They were identified according to the sounds they made.

Gomes (1979) meanwhile compared the demography and ecological adaptation between Jahai of Sungai Rual, Kelantan and Temuan of Kampung Paya Lebar, Selangor. The nomadic nature of the Jahai led them to be hunter-gatherer. The animals were hunted or trapped, while the plants and mushrooms were collected for personal utilization or sold. The Temuan on the other hand, being permanent settlers involved in agricultural activity. This includes the cultivation of wet rice, vegetables and fruit trees, rubber tapping and collecting forest products. The Jahai, having fewer children probably for mobility was very different than the Temuan's growing population. He suggested that the amount of food supplies from agricultural activity caused the booming population number of Temuan. This continues for generations until today, making Temuan one of the largest Orang Asli tribes in Malaysia.

MATERIALS AND METHODS

3.0

MATERIALS AND METHODS

3.1 Materials

- a) Notebook
- b) Global Positioning System (GPS)
- c) Voice recorder
- d) Secateurs
- e) Tags
- f) Plastic bags
- g) Hand knife
- h) Aluminium foils
- i) Newspapers
- j) Cardboards
- k) Pressing bars
- l) Plastic raffia strings
- m) Camera
- n) Alcohol 95 %

3.2 Study locations

Fourteen sites located in four districts in Selangor (Fig. 3.1 and Table 3.1) as follows were studied:

- i. Kuala Langat district
 - a. Sungai Bumbun Orang Asli Village, Jugra
 - b. Sungai Kurau Orang Asli Village, Jugra
 - c. Sungai Rambai Orang Asli Village, Jugra
 - d. Sungai Judah Orang Asli Village, Jugra

- e. Kepau Laut Orang Asli Village, Jugra
- ii. Hulu Langat district
 - a. Broga Orang Asli Village, Semenyih
- iii. Hulu Selangor district
 - a. Kolam Air Orang Asli Village, Kuala Kubu Bharu
 - b. Tun Abdul Razak Orang Asli Village, Kuala Kubu Bharu
 - c. Sungai Jang Orang Asli Village, Kerling
 - d. Gurney Orang Asli Village, Batang Kali
 - e. Hulu Tamu Orang Asli Village, Batang Kali
 - f. Songkok Orang Asli Village, Batang Kali
- iv. Gombak district
 - a. Bukit Lagong Orang Asli Village, Sungai Tua
 - b. Ulu Kuang Orang Asli Village, Rawang 2

The study sites were selected based on:

- i. The recommendation from Department of Orang Asli Development or Jabatan Kemajuan Orang Asli (JAKOA), based on the villagers' usage of natural resources such as for medicine and consumption
- ii. Villages consist of different tribes of Orang Asli in Selangor
- iii. Villages that still possessed indigenous knowledge, located in different districts in Selangor and recommended by the JAKOA
- iv. Available forested areas near the village where the collection of natural resources by the Orang Asli took place
- v. Accessible village locations via transportation

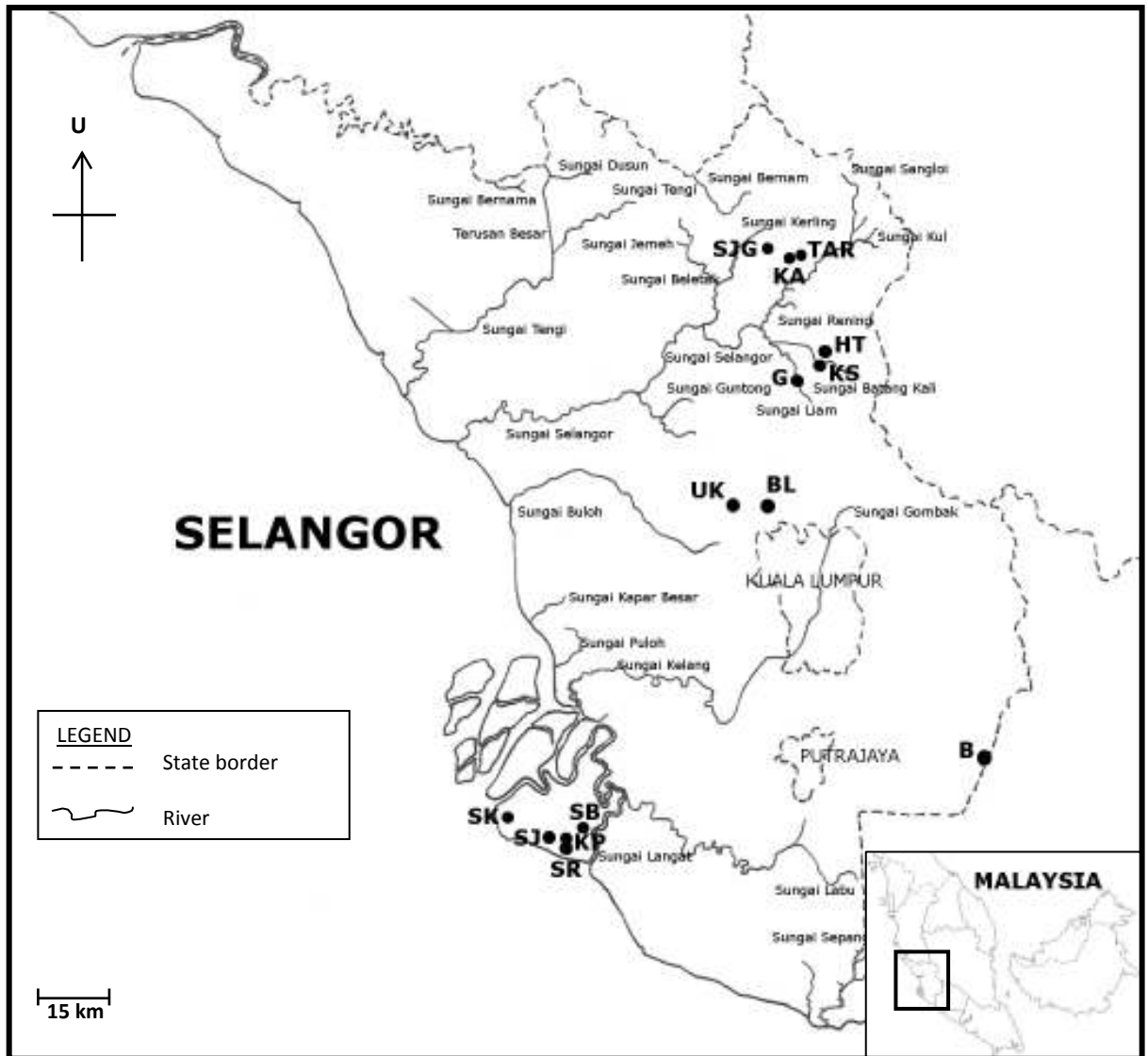


Figure 3.1: Locations of study sites in Selangor (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Table 3.1: Details of study locations

District	Study Locations	Coordinates	Area	Ethnicity	Tribe	Population
Kuala Langat	Sungai Bumbun Orang Asli Village (SB)	N 02° 50' 56.1" E 101° 23' 47.5"	140.04 ha	Senoi	Mah Meri	391
	Sungai Kurau Orang Asli Village (SK)	N 02° 51' 45.9" E 101° 17' 49.5"	64.57 ha	Senoi	Mah Meri	193
	Sungai Rambai Orang Asli Village (SR)	N 02° 49' 53.8" E 101° 22' 30.3"	40.44 ha	Senoi	Mah Meri	71
	Sungai Judah Orang Asli Village (SJ)	N 02° 50' 06.8" E 101° 21' 09.3"	192.53 ha	Senoi	Mah meri	349
	Kepau Laut Orang Asli Village (KP)	N 02° 49' 27.4" E 101° 22' 31.2"	146.00 ha	Senoi	Mah Meri	145
Hulu Langat	Broga Orang Asli Village (B)	N 02° 56' 28.1" E 101° 54' 42.4"	20.23 ha	Proto-Malay	Temuan	211
	Kolam Air Orang Asli Village (KA)	N 03° 34' 40.8" E 101° 40' 19.3"	12.14 ha	Proto-Malay	Temuan	33
Hulu Selangor	Tun Abdul Razak Orang Asli Village (TAR)	N 03° 34' 24.6" E 101° 39' 17.1"	8.08 ha	Proto-Malay	Temuan	460
	Sungai Jang Orang Asli Village (SJG)	N 03° 35' 20.8" E 101° 37' 41.5"	4.5 ha	Proto-Malay	Temuan	75
	Gurney Orang Asli Village (G)	N 03° 25' 13.4" E 101° 40' 0.19"	6.40 ha	Proto-Malay	Temuan	187
	Hulu Tamu Orang Asli Village (HT)	N 03° 27' 32.1" E 101° 42' 12.6"	200.00 ha	Proto-Malay	Temuan	309
	Songkok Orang Asli Village (KS)	N 03° 26' 22.0" E 101° 41' 42.4"	100.00 ha	Proto-Malay	Temuan	26
Gombak	Bukit Lagong Orang Asli Village (BL)	N 03° 15' 43.6" E 101° 37' 43.1"	22.67 ha	Proto-Malay	Temuan	615
	Ulu Kuang Orang Asli Village (UK)	N 03° 15' 46.0" E 101° 34' 59.5"	60.70 ha	Proto-Malay	Temuan	549

(Source: Jabatan Kemajuan Orang Asli (JAKOA))

Most of the selected villages have their own traditional medicine healers or the villagers themselves possessed the knowledge of traditional medicines.

Upon acquiring the permission from JAKOA, introductions to the heads of the villages, *Batin* or *Ketua Kampung* were made by the officers of JAKOA. This is very important since it reflect a sign of respect. The *Batin* in most of the villages were vital informant in this study, as they usually possess the knowledge of the utilization of natural resources from the previous generations. The *Batin* and *Ketua Kampung* also recommended the villagers who can be of help in this study. In some cases, the *Batin* or *Ketua Kampung* play the role as guide while interviewing knowledgeable villagers who possess the traditional knowledge of natural resources utilization.

3.2.1 Sungai Bumbun Orang Asli Village

This village is located on Carey Island in the sub-district of Jugra, Kuala Langat district. Its specific coordinate is N 02° 50' 56.1" E 101° 23' 47.5". Sungai Bumbun has an area of 140.04 ha. About 133.44 ha from this are used for plantations and orchards. Specifically, 126.96 ha are used for oil palm plantation, 4.46 ha for coconut palm plantation and 2.02 ha for orchards. The villagers consist of the Mah Meri tribe, headed by Batin Sidin anak Bujang. Sungai Bumbun has a population of 440 persons. Mainly, the villagers work in oil palm plantation, factory, orchard, carving and cultural show. Their woodcraft and cultural show have become an attraction among the tourists, making the village as one of the tourism spots in Malaysia. The village's infrastructure and facilities includes electricity and water supplies, craft workshop, craft exhibition room, primary school (*Sekolah Rendah Kebangsaan Sungai Bumbun* – Sungai Bumbun Primary School), field, tourism complex, craft complex, kindergarten, a multipurpose hall, *surau*, convenient store, medical hall building and tarred roads.

3.2.2 Sungai Kurau Orang Asli Village

Sungai Kurau is located on Carey Island, in the Jugra sub-district, Kuala Langat. Its coordinate is N 02° 51' 45.9" E 101° 17' 49.5". Sungai Kurau has an area of 64.57 ha with 51.00 ha are used for oil palm plantation. The Mah Meri population in this village is 212 persons, headed by Batin Nengkak anak Mat. The main source of income for the villagers is fishing and coastal fishing. Other than that, some of the villagers work in the oil palm plantations and employed by the Golden Hope Plantation. This is the farthest located village among other Orang Asli villages on Carey Island (from its entrance near Teluk Panglima Garang, Selangor). The village's infrastructure and facilities includes water and electricity supplies, tarred roads, medical hall building, convenient store and multipurpose hall.

3.2.3 Sungai Rambai Orang Asli Village

Sungai Rambai is located on Carey Island, in the sub-district of Jugra and Kuala Langat district. Its specific coordinate is N 02° 49' 53.8" E 101° 22' 30.3". This village is the smallest in terms of size and population among all Orang Asli villages on Carey Island with the area of 40.44 ha. About 31.09 ha are used for oil palm plantation and 2.02 ha for coconut palm plantation. It comprised of 98 Mah Meri villagers, headed by Batin Dollah Anak Kadir. Their main source of income lies on working in the oil palm and coconut palm plantation. The village's infrastructure and facilities includes tarred roads, water and electricity supplies; and kindergarten.

3.2.4 Sungai Judah Orang Asli Village

Sungai Judah of Carey Island is located in the sub-district of Jugra and Kuala Langat district. The coordinate of this village is N 02° 50'06.8" E 101° 21' 09.3". The total area of the village is 192.53 ha. About 80.90 ha are used for oil palm plantation,

8.10 ha for coconut palm plantation and 8.10 ha for orchard. The villagers are from the Mah Meri tribe with the total population of 349 persons. The head of this village is Batin Ata Anak Aya. Most of the villagers work whether as coastal fishermen or shallow-water fishermen. Some of them meanwhile work in the oil palm and coconut palm plantation. Infrastructure and facilities provided in the village include tarred roads, water and electricity supplies, community hall, primary school and medical hall.

3.2.5 Kepau Laut Orang Asli Village

Kepau Laut is located on Carey Island in Jugra sub-district, Kuala Langat district. This village has an area of 146.00 ha. About 40.46 ha are used for oil palm plantation and 6.10 ha for coconut palm plantation. The coordinate of this village is N 02° 49' 27.4"E 101° 22' 31.2". Batin Zamzam @ Salim Abdullah is the *Batin* or head of this village. The villagers consist of the Mah Meri tribe with a total population of 153 persons. The villagers mostly work in the oil palm and coconut palm plantation for their source of income. The infrastructure and facilities provided in Kepau Laut are tarred roads, water and electricity supplies; and multipurpose hall.

3.2.6 Broga Orang Asli Village

Broga Village is located at the border between Selangor and Negeri Sembilan states, in Semenyih sub-district, Hulu Langat. Its specific coordinate is N 02° 56' 28.1" E 101° 54' 42.4". The village has an area of 20.23 ha. The villagers comprised of the Temuan tribe and the Malays. The total number of villagers is 211 persons, led by Batin Ilan Johos. The villagers' sources of incomes come from working in the town or offices besides working as rubber-tappers in the rubber estate nearby. Some of them collect forest products from the forested area near the village. This village has a traditional medicine healer name Johos bin Bebas or Tok Jenang. His patients come from inside

and outside of the village. The village's infrastructure and facilities includes electricity supplies, tarred roads, multipurpose hall, convenient store, *surau*, primary school and kindergarten. The water supply is acquired from the water source in the mountainous area near the village using gravity feed system. This system pumps water from the water source to the houses in the village.

3.2.7 Kolam Air Orang Asli Village

Kolam Air is located in the sub-district of Kuala Kubu Bharu in Hulu Selangor. The specific coordinate of this village is N 03° 34' 40.8" E 101° 40' 19.3". The total area of the village is 12.15 ha. About 12.14 ha are used for orchard. It is located near the Kuala Kubu Bharu town. Kolam Air is populated by the Temuan, with the total population of 33 persons. Instead of a *Batin*, Kolam Air is headed by a *Ketua*. This was due to its small number of villagers and size. It is put under the supervision of the *Batin* from Tun Abdul Razak Orang Asli Village. The *Ketua Kampung* of this village is Asan Polis. Originally, the villagers came from the Tun Abdul Razak Orang Asli Village in Kuala Kubu Bharu. However, as they often tend to their orchard that was located near their present settlement, the villagers decided to open a new village instead. The villagers' incomes come from selling the forest and orchard products such as *Parkia speciosa* and working in the town nearby. The forested area near the village has a water reservoir with a dam built inside it. The area is off limits to any development projects. Even the orchard planted by the villagers is not entirely encouraged. The facilities and accommodations available in Kolam Air include tarred roads and freshwater fish farm. The villagers acquire their water supplies through gravity feed system from the water source in the hill areas near the village.

3.2.8 Tun Abdul Razak Orang Asli Village

Tun Abdul Razak is located in Kuala Kubu Bharu sub-district, Hulu Selangor. The village location is N 03° 34' 24.6" E 101° 39' 17.1". The village has a total area of 8.08 ha and an orchard of 20.23 ha. The total population of this village is 605 persons comprising of the Temuan tribe and Indonesians. They are led by Batin Asu Dollah. Tun Abdul Razak was formally opened after the Japanese invasion. Before that, the villagers lived on scattered grounds on the hills of Sungai Sebarau, Gerachi, Pertak and Sungai Kiol. They were then relocated to a new area known as Tun Abdul Razak until today. Tun Abdul Razak is the only Orang Asli village in Hulu Selangor district that has been gazetted as an Orang Asli Reserve. The gazetted area covers the village and the school near the village. The villagers depend on various activities for their sources of incomes. This includes working in the town nearby, collecting forest products and cattle herding. The infrastructure and facilities available in Tun Abdul Razak include tarred roads, multipurpose hall, JKKK (*Jawatan Kuasa Kemajuan dan Keselamatan* or Development and Safety Committee) hall, *surau*, kindergartens, field, soccer field, primary school, fire hydrants, water and electricity supplies; and telephone landlines.

3.2.9 Sungai Jang Orang Asli Village

Sungai Jang is located in the Kerling sub-district, Hulu Selangor. The village's coordinate is N 03° 35' 20.8" E 101° 37' 41.5". This village has an area of settlement of 4.50 ha and orchards of 8.09 ha. The *Batin* of this village is Batin Salut Undek. Sungai Jang is populated with the Temuan tribe with the total population of 81 persons. The villagers originally came from Tun Abdul Razak in 1954. Due to some misunderstanding, the land was once sold to a private property. However, the government has bought back the land so that the villagers of Sungai Jang can settle on until now. The villagers' sources of incomes come from the activity of selling the

products from their orchard and working in the nearby town. The infrastructure and facilities available in Sungai Jang are multipurpose hall, *Sepak Takraw* court, fire hydrant, electricity supply and tarred roads. The source of water in this village is acquired through the gravity feed system from the water source in the forested area near the village.

3.2.10 Gurney Orang Asli Village

Gurney Village is located in the Batang Kali sub-district, Hulu Selangor. The specific coordinate of the village is N 03° 25' 13.4" E 101° 40' 0.19". Gurney Village has an area of 6.40 ha for settlement and 39.40 ha for rubber tree estate. The villagers comprised of the Temuan tribe with 226 persons. They are headed by Batin Johari Jenang Pesan. The villagers were originated from the Sungai Sendat Orang Asli Village before they were relocated in Gurney Village. Nowadays their original settlement, Sungai Sendat Orang Asli Village is used merely for orchard and collecting forest products. The villagers involved mostly in collecting forest products, while some involved in rubber tapping and working in the town nearby. The infrastructure and facilities in Gurney Village include community and multipurpose halls, fire hydrants, water and electricity supplies, freshwater fish farm and tarred roads.

3.2.11 Hulu Tamu Orang Asli Village

Hulu Tamu is located in the sub-district of Batang Kali, Hulu Selangor. The specific coordinate of the village is N 03° 27' 32.1" E 101° 42' 12.6". The total area of the village is 200.00 ha. About 16.19 ha are used for rubber tree estate. Hulu Tamu has the total population of 373 persons from the Temuan tribe and others, such as the Ibans of Sarawak and Indonesian. This village is headed by Batin Alam Supah. The villagers' sources of incomes come from the activity of rubber tapping, collecting forest products

and working in the town nearby. The facilities and infrastructure in Hulu Tamu are multipurpose hall, kindergarten, water and electricity supplies, fire hydrants and tarred roads. Some of the water supplied to the village depends on the gravity feed system from the river near the village.

3.2.12 Songkok Orang Asli Village

Songkok Village is located in the Batang Kali sub-district, Hulu Selangor. Its coordinate is N 03° 26' 22.0" E 101° 41' 42.4". The village has an area of 100.00 ha in total. Songkok Village is populated with 86 persons from the Temuan tribe and Malay. It was not led by *Batin* since it has a small population. However, it is put under the supervision of the *Batin* of Hulu Tamu. Originally the villagers of Songkok Village came from the Bentung Orang Asli Village, Pahang in 1940. In the beginning, they were involved in perennial plants orchards beside *Ladang Sungai Remok*. The villagers later moved into the area near the orchard instead of travelling back and forth between the orchard and their original village. In order to intercept the communist movement back in 1948, a secure road was built between Batang Kali and Genting. Thus, the villagers of Songkok Village were relocated on the roadside to improve the communications. After the project to improve the road quality, which commenced in early 1990s, Songkok Village was relocated on the main road between Batang Kali and Genting Highland. Since this village is located in reserved forest area, any economic activity in the area is forbidden except for orchard by the villagers. The villagers work mostly in the town nearby or collecting forest products to be sold. The infrastructures and facilities available in Songkok Village are community hall, *surau*, field and tarred roads. The water supply is acquired from treated and filtered gravity feed system water from a small river near the village. This system is powered using solar energy.

3.2.13 Bukit Lagong Orang Asli Village

Bukit Lagong is located in the sub-district of Sungai Tua, in the district of Gombak. The coordinate of this village is N 03° 15' 43.6" E 101° 37' 43.1". It has a total area of 22.67 ha. About 8.09 ha are used for orchard. Bukit Lagong is headed by Batin Bee Abdullah. The total population of the village is 94 persons comprising of the Temuan tribe. Some of these villagers however were originally from Bukit Lanjan Orang Asli Village. They have been relocated to this village around five to six years ago. This village and its forested areas, is under the supervision of Selangor Department of Forestry. The sources of incomes of the villagers comes from working in the town nearby, goat herding, collecting forest and orchard products; and freshwater fishes farming. The infrastructure and facilities available in Bukit Lagong includes multipurpose halls, *surau*, community activity house, tarred roads, electricity supply and freshwater fish farms. The villagers acquire their water source from treated and filtered gravity feed system to their houses.

3.2.14 Ulu Kuang Orang Asli Village

Ulu Kuang is located in Rawang sub-district, Gombak. The specific coordinate of this village is N 03° 15' 46.0" E 101° 34' 59.5". The total area of the village is 121.46 ha. About 60.70 ha and 2.43 ha are used for oil palm estate and banana tree orchard, respectively. This village is led by Batin Buntal a/l Deraman. The total population of this village is 550 persons from the Temuan tribe. Their economic activities include cattle herding, working in the oil palm plantation and banana tree orchard; and chicken rearing, besides working in the town nearby. Additionally, several individuals from Ulu Kuang are reported by Batin Buntal a/l Deraman as traditional medicine men, which include Encik Derus. The infrastructure and facilities available in Ulu Kuang includes cultural stage, multipurpose hall, community hall, *surau*,

kindergarten, soccer field, *Sepak Takraw* court, medical hall, knowledge hall, water and electricity supplies, tarred roads and bridge. The water is supplied through filtered and treated gravity feed system from the water source in the forested area near the village.

3.3 Methods

3.3.1 Data collection

Data were collected through interviews using semi-structured questionnaire on the villagers through individual or group interviews. The interviews were guided by predetermined set of questions (Appendix 1). The informants comprised of the villagers recommended by the officers from JAKOA and *Batin* (or *Ketua Kampung* in some villages). This questionnaire involved the details of the informants, the natural resources that were used or the knowledge of the natural resources usage that they possess, the characteristics of the natural resources, purposes, parts used, detailed preparations and administrations (in terms of medicinal purposes). The information (including the informants' details) was recorded in a notebook and voice recording device.

3.3.2 Specimens collection

The specimens related to the study were collected in the forested areas near the villages. These also include the areas where the Orang Asli villagers usually collect jungle products or specific natural resources for medicine. The collections were made under the guidance of the informants, either the traditional medicine healers or the villagers. The villagers acting as guide usually possessed and applied the knowledge of natural resources in daily life despite the availability of modern medicine. In addition, the informants also provided informations on the local names of the specimens, parts used and purposes. If the natural resources were used as medicine, information of the specific ailments, method of preparations and administrations were provided. Photos of

the available and collected specimens were taken for identification. The specimen's characteristics were recorded. Collected specimens were deposited in University of Malaya Herbarium (KLU).

3.3.3 Herbarium specimens preparation and deposition

3.3.3.1 Plants

Plant species was pressed between sheets of newspapers to absorb the moisture and avoid moulding. The sheets were stacked and placed in between cardboard sheets for ventilation purposes. Metal pressing bars were placed at both ends of the cardboard bundle. The bundle of specimens was tightly tied using raffia strings or straps. These processes were called plant pressing. The specimen bundles were dried in an oven for about seven to 14 days. It was done in order to dry the specimens and prevent moulding when it was deposited in the herbarium. Furthermore, it prevents the specimens from losing its shape, structure and parts while killing any insects on the specimens.

Dried specimens were then stored in a freezer with the temperature of below 0 °C. This was done to kill any remaining insects, which might have survived the drying process. The specimens were then mounted.

The mounting procedure referred to the process of fixing the specimens on the herbarium sheets. This enabled them to be stored in the herbarium without causing much damage to the specimens. The specimens were mounted using glue and dried. Later, using mounting threads, the specimens were tied to the sheets and the knots were taped to make it more secure (lasting for at least a few decades). The sheets were labelled, deposited and stored in the herbarium for future references by other researchers. Once deposited, the specimens' collection or accession numbers were obtained and listed in Appendix 2.

3.3.3.2 Mushrooms

Detailed characteristics of mushroom samples were observed and recorded. The specimens were placed in boxes with the size appropriate to the specimens. It was then dried in the oven. The specimens were then labelled. The collection numbers were given and the specimens were deposited in the herbarium.

3.3.3.3 Animals

Animal specimens were not collected. This was due to the time consuming and luck in setting up traps and collecting the wild animals in the forested areas. Moreover, there were few wild animals left in the forested areas. During the interviews, animal species that were utilized by villagers were inquired in specific details. Illustrations of wild animal species were also shown if it matched with the descriptions mentioned. Additionally, certain species of animals were taken as pets by the villagers. These species' pictures were taken for identification. Other parts of animals such as bones, teeth, quills, fur, etc. was not collected (or taken pictures) for identification purpose. This was because the unavailability of these materials in the study locations during this study.

3.3.4 Specimens and species identification

The identification of species were done with the help of supervisors, books, journals, seminars and proceedings paper, which includes Chang and Lee (2003); Faridah Hanum and Khamis (2004); Holmes (1998); Keng (1969); Larsen, Ibrahim, Khaw and Saw (1999); Lee, Chang and Noraswati (2006); Lee and Chang (2007); Medway (1978); Mohammad Mohsin and Mohd. Azmi (1983); Ong (2008); Pegler and Spooner (1997); Piggott (1988); Polunin (1994); Ridley (1922, 1924a, 1924b, 1925); Rukayah (2006); Samy, Sugumaran and Lee (2005); and Wong (1995).

3.3.5 Data processing

The collected data were arranged using Microsoft Office Words 2007 SP2 and Microsoft Office Excel 2007 SP2. The figures meanwhile were done using GIMP 2.6.11 and Microsoft Office Excel 2007 SP2.

3.3.6 Equation and formula

The comparison of the species was done through calculating the similarity coefficients between villages and both tribes using Jaccard Index (JI). This index was among the three indices that can show the sample similarity and species association. The other two indices are Sorenson or Dice Index (DI) and Ochiai Index (OI) (Höft, Barik & Lykke, 1999; Ludwig & Reynolds, 1988). These indices range from 0 to 1, with no similarity represented as 0 and highly similar species in both locations as 1 (Höft *et al.*, 1999).

$$\text{Jaccard Index (JI)} = \frac{c}{a + b - c}$$

a = the total number of species in location a

b = the total number of species in location b

c = the similar species in both a and b

(Source: Real and Vargas, 1996)

RESULTS AND DISCUSSION

This study covers fourteen Orang Asli villages in Selangor consisting of five Mah Meri and nine Temuan villages. The natural resources focused were plants, mushrooms and animals. These resources were categorized according to their utilization i.e. for medicine, consumption and spiritual purpose.

4.1 Utilization of Plant Species by the Mah Meri and Temuan Tribes

Table 4.1 listed the plant species recorded in this study. It was tabulated according to its utilization by the Mah Meri and Temuan tribes in Selangor. Sums of 287 species of plants from 90 families were used by the Temuan and Mah Meri for medicine, consumption or spiritual purpose. Zingiberaceae family was dominantly used with 24 species (8.4 %), followed by Fabaceae with 23 species (8.0 %) and Arecaceae with 15 species (5.2 %).

Overall, 233 species of the plants were utilized by the Temuan whilst 102 species by the Mah Meri. Forty-eight species of plants were used by both tribes. Meanwhile 185 species and 54 species were used only by the Temuan and Mah Meri tribes, respectively (Figure 4.1).

With regard to the categories of utilization, 163 species of plants were used for consumption, 166 species for medicine and 14 species for spiritual purpose. Some species were utilized in more than one way. Specifically, 50 species were utilized for consumption and medicinal; two species were utilized for consumption and spiritual purpose; and four species for medicinal and spiritual purpose (Figure 4.2).

Apart from these categories of utilization, the Orang Asli used plant species for their ceremonial occasions and weaving, to tools used in their daily lives and houses.

These species, however, were hardly used and mentioned due to modernization and replacement of bamboo houses to brick houses.

Among the plant species listed in Table 4.1, 64.1 % (184 species) were collected in the wild, 32.1 % (92 species) were cultivated, whilst 3.8 % (11 species) were both cultivated and found in the wild. Species placed under “cultivated” category refer to the species domesticated or bought by the Orang Asli.

The similarity coefficient calculated using Jaccard Index (JI) shows 0.17. This indicates very low similarity of plant species used by the Mah Meri and Temuan tribes.

Table 4.1: List of plant species and its utilization by the tribes documented in this study

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
1.	<i>Abelmoschus esculentus</i> (L.) Moench (Malvaceae) ^C	Bendi	-		●	
2.	<i>Acanthus ilicifolius</i> L. (Acanthaceae) ^{CW}	-	Pokok nuju	●		
3.	<i>Acorus calamus</i> L. (Acoraceae) ^{CW}	-	Jerangau			●
4.	<i>Ageratum conyzoides</i> L. (Asteraceae) ^W	-	Daun tahi ayam	●		
5.	<i>Alocasia longiloba</i> Miq. (Araceae) ^C	Keladi bira hitam/ Keladi hitam/ Keladi batang hitam/ Keladi	-	●	●	
6.	<i>Alocasia</i> sp. (Araceae) ^C	Keladi batang hijau	-		●	
7.	<i>Aloe vera</i> (L.) Burm. f. (Xanthorrhoeaceae) ^C	-	Lidah buaya	●		
8.	<i>Alpinia galanga</i> (L.) Willd. (Zingiberaceae) ^C	Sengkuas	Lengkuas	●B		
9.	<i>Alpinia javanica</i> Blume (Zingiberaceae) ^W	Tepus bunga/ Tepus buah kanang/ Tepus buah di hujung/ Tepus	-		●	
10.	<i>Alpinia petiolata</i> Baker (Zingiberaceae) ^W	Pokok mengkanang	-		●	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
11.	<i>Alpinia</i> sp. (Zingiberaceae) ^W	Pokok tepus darah	-	●		
12.	<i>Alstonia</i> sp. (Apocyanaceae) ^W	Pokok pulai	-	●		
13.	<i>Amaranthus dubius</i> Mart. ex Thellung (Amaranthaceae) ^C	Bayam	Bayam		●B	
14.	<i>Amaranthus</i> sp. (Amaranthaceae) ^C	Pucuk bayam	-		●	
15.	<i>Amaranthus spinosus</i> L. (Amaranthaceae) ^W	Bayam duri	-	●		
16.	<i>Amomum conoideum</i> (Ridl.) Elmer (Zingiberaceae) ^W	Tepus susu	-		●	
17.	<i>Amorphophallus</i> sp. 1 (Araceae) ^W	Kayu jemali	-	●		
18.	<i>Amorphophallus</i> sp. 2 (Araceae) ^W	Pokok kelembun	-	●		
19.	<i>Anacardium occidentale</i> L. (Anacardiaceae) ^C	-	Gajus		●	
20.	<i>Anadendrum</i> sp. (Araceae) ^W	Selempat angin	-	●		
21.	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees (Acanthaceae) ^C	Hempedu bumi/ Akar cerita	-	●		
22.	<i>Angiopteris evecta</i> (Forst.) Haffm. (Marattiaceae) ^W	Paku gajah	Paku gajah	●B	●T	
23.	<i>Archidendron bubalinum</i> (Jack) I. C. Nielsen (Fabaceae) ^W	Pokok kerdas	-	●	●	
24.	<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae) ^C	Pokok jering	Jering	●B	●B	
25.	<i>Ardisia</i> sp. 1 (Myrsinaceae) ^W	Pokok mempenai	-		●	
26.	<i>Ardisia</i> sp. 2 (Myrsinaceae) ^W	Pokok mensia/ Geranap/ Mensia batu	-		●	
27.	<i>Areca catechu</i> L. (Arecaceae) ^C	Pokok pinang	Pinang		●B	
28.	<i>Arenga obtusifolia</i> Mart. (Arecaceae) ^W	Pokok langkap	-		●	
29.	<i>Arenga pinnata</i> (Wurmb) Merr. (Arecaceae) ^W	Pokok ketu/ Ketor	-		●	
30.	<i>Arenga westerhoutii</i> Griff. (Arecaceae) ^W	Pokok abok	-	●		
31.	<i>Artabotrys</i> sp. (Annonaceae) ^W	Sembelit betina	-	●		

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
32.	<i>Artocarpus altilis</i> (Parkinson) Fosberg (Moraceae) ^C	Buah sukun	-	•		
33.	<i>Artocarpus heterophyllus</i> Lam. (Moraceae) ^C	Nangka	Nangka	•T	•B	
34.	<i>Artocarpus lanceifolius</i> Roxb. (Moraceae) ^W	Pokok keledang	-		•	
35.	<i>Artocarpus rigidus</i> Blume (Moraceae) ^W	Buah temponek	-		•	
36.	<i>Artocarpus integer</i> var. <i>silvestris</i> Corner (Moraceae) ^{CW}	Pokok bangkung/ Cempedak hutan	-		•	
37.	<i>Averrhoa bilimbi</i> L. (Oxalidaceae) ^C	-	Belimbing buluh	•	•	
38.	<i>Averrhoa carambola</i> L. (Oxalidaceae) ^C	Pokok belimbing/ Belimbing besi	-	•	•	
39.	<i>Avicennia lanata</i> Ridley (Avicenniaceae) ^W	-	Pokok api-api		•	
40.	<i>Azadirachta indica</i> Adr. Juss. (Meliaceae) ^W	Daun mambu	-	•		
41.	<i>Baccaurea bracteata</i> Müll. Arg. (Phyllanthaceae) ^W	Rambai cicit	-		•	
42.	<i>Baccaurea lanceolata</i> (Miq.) Müll. Arg. (Phyllanthaceae) ^W	Asam pahung/ Buah pahung	-		•	
43.	<i>Baccaurea macrocarpa</i> (Miq.) Müll. Arg. (Phyllanthaceae) ^W	Pokok tampoi	-		•	
44.	<i>Baccaurea parviflora</i> (Müll. Arg.) Müll. Arg. (Phyllanthaceae) ^W	Buah taban/ Pokok tambun/ Rambai tambun	-		•	
45.	<i>Baccaurea</i> sp. (Phyllanthaceae) ^W	Rambai pacat	-		•	
46.	<i>Barringtonia racemosa</i> (L.) Spreng. (Lecythydaceae) ^W	Pucuk putat	-		•	
47.	<i>Bauhinia crudiantha</i> (de Wit) Cusset (Fabaceae) ^W	Akar lempang	-	•		
48.	<i>Bauhinia</i> sp. (Fabaceae) ^W	Akar lapar	-			•
49.	<i>Blechnum orientale</i> L. (Blechnaceae) ^W	Paku	-	•		
50.	<i>Bouea macrophylla</i> Griff. (Anacardiaceae) ^C	-	Asam kundang		•	
51.	<i>Calamus</i> sp. (Arecaceae) ^W	Rotan	-	•		
52.	<i>Canna indica</i> L. (Cannaceae) ^C	Pokok ganyung	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
53.	<i>Capsicum baccatum</i> var. <i>pendulum</i> (Willd.) Eshb. (Solanaceae) ^C	Pokok lada	-	•		
54.	<i>Capsicum frutescens</i> L. (Solanaceae) ^C	-	Cili api		•	
55.	<i>Carica papaya</i> L. (Caricaceae) ^C	Pokok betik	Pokok betik	•B	•B	
56.	<i>Caryota mitis</i> Lour. (Arecaceae) ^W	Pokok tukas	-		•	
57.	<i>Castanopsis</i> sp. (Fagaceae) ^W	Pokok berangan	-		•	
58.	<i>Catharanthus roseus</i> (L.) G. Don (Apocyanaceae) ^C	-	Pokok bunga putih	•		
59.	<i>Centella asiatica</i> (L.) Urban (Apiaceae) ^C	Pegaga	Pegaga/ Daun gaga	•M	•B	
60.	<i>Champereia manillana</i> (Blume) Merr. (Opiliaceae) ^W	Pokok cemperai/ Cemperai tuto/ Pucuk cemperai/ Pucuk tangki	-		•	
61.	<i>Cheilocostus speciosus</i> (J. König) C. Specht (Costaceae) ^C	Pokok penawar/ Pokok penduk/ Pokok setawar	-	•		•
62.	<i>Chloranthus officinalis</i> Blume (Chloranthaceae) ^W	Pokok nonas	-	•		
63.	<i>Chromolaena odorata</i> (L.) King & H. E. Robins (Asteraceae) ^W	Pokok kapal terbang	Pokok brunei	•B		
64.	<i>Cinnamomum iners</i> Reinw. ex Blume (Lauraceae) ^W	Pokok medang gijo/ Medang gija/ Medang tijo	-	•		
65.	<i>Cinnamomum rhynchophyllum</i> Miq. (Lauraceae) ^W	-	Pokok lawang	•		
66.	<i>Cinnamomum</i> sp. (Lauraceae) ^W	Pokok medang	-	•		
67.	<i>Cinnamomum zeylanicum</i> Blume (Lauraceae) ^C	-	Kayu manis		•	
68.	<i>Citrus aurantifolia</i> (Christm.) Swingle (Rutaceae) ^C	Limau nipis	-		•	•
69.	<i>Claoxylon longifolium</i> (Blume) Endl. ex Hassk. (Euphorbiaceae) ^W	Pucuk salak	-		•	
70.	<i>Cleome viscosa</i> L. (Capparaceae) ^W	Bunga maman	-	•		

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
71.	<i>Cnestis palala</i> (Lour.) Merr. (Connaraceae) ^W	Pokok akar sembelit/ Sembelit jantan	-	•		
72.	<i>Cnestis</i> sp. 1 (Connaraceae) ^W	Kayu kemalau	-	•		
73.	<i>Cnestis</i> sp. 2 (Connaraceae) ^W	Akar sembelit	-	•		
74.	<i>Cocos nucifera</i> L. (Arecaceae) ^C	Pokok kelapa	Pokok kelapa/ Kelapa mawar	•B	•B	
75.	<i>Coleus scutellarioides</i> (L.) Benth. (Lamiaceae) ^C	Bunga ati-ati	-	•		
76.	<i>Colocasia esculenta</i> (L.) Schott. (Araceae) ^C	Keladi udang	-		•	
77.	<i>Colocasia</i> sp. (Araceae) ^C	Keladi	Keladi/ Pucuk keladi		•B	
78.	<i>Cordyline fruticosa</i> (L.) A.Chev. (Asparagaceae) ^C	Pokok juang	-	•		
79.	<i>Cosmos caudatus</i> Kunth (Asteraceae) ^C	Ulam raja/ Awan jala	Ulam raja		•B	
80.	<i>Crinum asiaticum</i> L. (Amaryllidaceae) ^C	Pokok tuasa/ Pokok bunga seliuh/ Pokok bunga bawang/ Tembaga suasa	-	•		
81.	<i>Cucurbita moschata</i> (Duchesne ex Lam.) Duchesne ex Poir (Cucurbitaceae) ^C	Labu	Labu		•B	
82.	<i>Curcuma longa</i> L. (Zingiberaceae) ^C	Kunyit	Kunyit	•B	•B	
83.	<i>Cyathea moluccana</i> R. Br. (Cyatheaceae) ^W	Paku lebur/ Paku lebu	-	•		
84.	<i>Cyrtandromoea grandis</i> Ridl. (Scrophulariaceae) ^W	Pokok penawar	Pokok bunga/ Pokok setawar	•B		
85.	<i>Davallia denticulata</i> (Burm.f.) Mett. Ex Kuhn (Davalliaceae) ^W	Paku hutan	-		•	
86.	<i>Dendrocalamus asper</i> (Schultes f.) Backer ex Heyne (Poaceae) ^W	Buluh betong	Buluh betong		•B	
87.	<i>Dianella ensifolia</i> (L.) DC. (Xanthorrhoeaceae) ^C	Pokok bisul	-	•		

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
88.	<i>Didymocarpus platypus</i> C. B. Clarke (Gesneriaceae) ^W	Kacip fatimah hijau/ Merian gete'h/ Pokok sampuk bercep	-	•		
89.	<i>Dillenia indica</i> L. (Dilleniaceae) ^W	Pokok sampu	-	•	•	
90.	<i>Dillenia</i> sp. (Dilleniaceae) ^W	Pokok jangkang	-	•		
91.	<i>Dioscorea</i> sp. (Dioscoreaceae) ^W	Akar duri	-	•		
92.	<i>Diplazium esculentum</i> (Retz.) Sw. (Dryopteridaceae) ^W	Pucuk paku/ Paku padang	Paku tanjung/ Paku hijau/ Pucuk paku		•B	
93.	<i>Donax canniformis</i> (G. Forst.) K. Schum. (Marantaceae) ^C	Pokok bemban	Bemban	•T	•B	
94.	<i>Durio zibethinus</i> Murray (Bombacaceae) ^C	Pokok durian	-	•	•	
95.	<i>Durio</i> sp. (Bombacaceae) ^W	Durian hutan	-			•
96.	<i>Eclipta prostrata</i> (L.) L. (Asteraceae) ^W	-	Pokok aring-aring	•		
97.	<i>Eichhornia crassipes</i> (Mart.) Solms (Pontederiaceae) ^W	Kembayau	-		•	
98.	<i>Elaeis guineensis</i> Jacq. (Arecaceae) ^C	-	Kelapa bali/ Kelapa sawit		•	
99.	<i>Elateriospermum tapos</i> Blume (Euphorbiaceae) ^W	Pokok buah perah/ Pokok perah	-	•	•	
100.	<i>Elattariopsis curtisii</i> Baker (Zingiberaceae) ^{CW}	Kari hutan/ semomok	-	•	•	
101.	<i>Eleiodoxa conferta</i> (Griff.) Burret (Arecaceae) ^C	Asam kelubi	Asam kelubi		•B	
102.	<i>Elettariopsis</i> sp. (Zingiberaceae) ^C	Tepus sengloi	-			•
103.	<i>Embelia</i> sp. (Myrsinaceae) ^W	Ubat demam/ Pokok Bayam layar/ Bayam terbang/ Pokok gabong/ Gebong	-		•	•
104.	<i>Erechtites valerianifolia</i> (Link ex Wolf) Less ex. DC. (Asteraceae) ^W	Pokok	-	•	•	
105.	<i>Etilingera elatior</i> (Jack) R. M. Sm. (Zingiberaceae) ^W	Bunga kantan	-		•	
106.	<i>Etilingera littoralis</i> (J. König) Giseke (Zingiberaceae) ^W	Tepus kancil	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
107.	<i>Etlintera maingayi</i> (Baker) R. M. Sm. (Zingiberaceae) ^W	Tepus darah	-	•		
108.	<i>Etlintera rubrolutea</i> (Baker) C. K. Lim (Zingiberaceae) ^W	Tepus tungku/ Tepus merah	-		•	
109.	<i>Etlintera</i> sp. (Zingiberaceae) ^W	Tepus padi/ Tepus biasa/ Tepus darah	-	•	•	
110.	<i>Etlintera triorgyalis</i> (Baker) R. M. Sm. (Zingiberaceae) ^W	Tepus susu/ Tepus ubat sakit perut	-	•	•	
111.	<i>Eulophia graminea</i> L. (Orchidaceae) ^C	-	Bawang hantu	•	•	
112.	<i>Euphorbia neriifolia</i> L. (Euphorbiaceae) ^C	-	Bunga penawar	•		
113.	<i>Euphorbia tithymaloides</i> L. (Euphorbiaceae) ^C	-	Bunga lipan	•		
114.	<i>Eurycoma apiculata</i> A.W.Benn. (Simaroubaceae) ^C	Pasak bumi	-	•		
115.	<i>Eurycoma longifolia</i> Jack (Simaroubaceae) ^{CW}	Tongkat ali	Tongkat ali	•B		
116.	<i>Fagraea obovata</i> Wall. (Loganiaceae) ^W	Akar tengkuk jawak	-	•		
117.	<i>Ficus callicarpa</i> Miq. (Moraceae) ^W	Akar biawak	-	•		
118.	<i>Ficus grossularioides</i> Burm.f. (Moraceae) ^W	Pokok jemantung	-		•	
119.	<i>Ficus obpyramidata</i> King ex Hook.f. (Moraceae) ^W	Pokok kelempung/ Pokok klepong	-		•	
120.	<i>Ficus variegata</i> Blume (Moraceae) ^W	Pokok ulam	-		•	
121.	<i>Flemingia strobilifera</i> (L.) Roxb. (Fabaceae) ^C	Pokok peringan/ Pokok peringan badan/ Pokok pelampung	-	•		
122.	<i>Garcinia nervosa</i> Miq. (Clusiaceae) ^W	Asam kandis	-		•	
123.	<i>Garcinia urophylla</i> Scort. ex King (Clusiaceae) ^W	Buah kandis	Pokok kandis/ Asam kandi		•B	
124.	<i>Garcinia xanthochymus</i> Hook. f. ex T. Anderson (Clusiaceae) ^W	Asam kandis	-		•	
125.	<i>Gigantochloa levis</i> (Blanco) Merr. (Poaceae) ^W	Buluh padi	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
126.	<i>Gigantochloa scortechinii</i> Gamble (Poaceae) ^W	Buluh cina/ Buluh leman	-		•	
127.	<i>Gigantochloa wrayi</i> Gamble (Poaceae) ^{CW}	Buluh manis	-		•	
128.	<i>Globba patens</i> Miq. (Zingiberaceae) ^W	Meriyen air/ Meriyen/ Tepus pemulih	-	•		
129.	<i>Globba</i> sp. 1 (Zingiberaceae) ^W	Meriyen air	-	•		
130.	<i>Globba</i> sp. 2 (Zingiberaceae) ^W	Meriyen batu	-	•		
131.	<i>Globba</i> sp. 3 (Zingiberaceae) ^W	Meriyen darah	-	•		
132.	<i>Goniothalamus macrophyllus</i> (Blume) Hook. f. & Thomson (Annonaceae) ^W	Pokok gajah beranak	-	•		
133.	<i>Grewia laurifolia</i> Hook. ex Mast (Tiliaceae) ^W	Pokok kepialu	-	•		
134.	<i>Helminthostachys zeylanica</i> (L.) Hook. (Ophioglossaceae) ^W	Pokok ubat jerawat/ Pokok tunjuk langit	-	•	•	
135.	<i>Hevea brasiliensis</i> (Willd. ex A. Juss.) Müll. Arg. (Euphorbiaceae) ^C	Pokok getah/ Pucuk getah	-		•	
136.	<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) ^C	Pokok bunga raya	Bunga raya	•B		
137.	<i>Hibiscus rosa-sinensis</i> L. var. <i>alba</i> (Malvaceae) ^C	Bunga raya putih	-	•		
138.	<i>Holttumochloa magica</i> (Ridley) K.M. Wong (Poaceae) ^W	-	Buluh perindu		•	
139.	<i>Homalomena sagittifolia</i> Jungh. ex Schott (Araceae) ^W	Kemoyang/ Kemoyan	-	•	•	
140.	<i>Horsfieldia</i> sp. (Myristicaceae) ^W	Pokok mendarah	-	•		
141.	<i>Hymenocallis speciosa</i> (L.f. ex Salisb.) Salisb. (Amaryllidaceae) ^C	Pokok demam panas	-	•		
142.	<i>Imperata cylindrica</i> (L.) Beauv. (Poaceae) ^W	Pokok lalang	Lalang	•B		
143.	<i>Indorouchera</i> sp. (Linaceae) ^W	Akar kelait	-	•		
144.	<i>Ipomea aquatica</i> Forssk. (Convolvulaceae) ^C	Kangkung	Kangkung		•B	
145.	<i>Ipomoea batatas</i> (L.) Lam. (Convolvulaceae) ^C	Pokok keledak	Keledak		•B	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
146.	<i>Ixonanthes icosandra</i> Jack (Ixonanthaceae) ^W	Pokok kayu pagar anak	-	•		
147.	<i>Justicia</i> sp. (Acanthaceae) ^W	Daun tegugur	-	•		
148.	<i>Kaempferia galanga</i> L. (Zingiberaceae) ^C	-	Daun cekur	•		•
149.	<i>Labisia pumila</i> (Blume) Fern.-Vill (Myrsinaceae) ^W	Kacip fatimah/ Meriyan bombong/ Akar fatimah/ Akar sembelit	Kacip fatimah	•B		
150.	<i>Lasia</i> sp. (Araceae) ^W	Akar segenuali	-	•		
151.	<i>Lasianthus cyanocarpus</i> Jack (Rubiaceae) ^W	Kayu celaka	-			•
152.	<i>Lawsonia inermis</i> L. (Lythraceae) ^C	-	Pokok inai	•		
153.	<i>Leea indica</i> (Burm.f.) Merr. (Vitaceae) ^W	Daun malik/ Daun bali/ Pokok membali/ Pokok memali	Pokok mali-mali	•B	•T	
154.	<i>Leptaspis</i> sp. (Poaceae) ^W	Meriyan batu	-	•		
155.	<i>Leucaena leucocephala</i> (Lam) de Wit. (Fabaceae) ^C	Pokok petai belalang	-	•	•	
156.	<i>Licuala longipes</i> Griff. (Arecaceae) ^W	Pokok kipas	-		•	
157.	<i>Lophatherum gracile</i> Brongn. (Poaceae) ^W	Rumput banyak anak/ Rumput simbah	-	•		
158.	<i>Luffa acutangula</i> (L.) Roxb. (Cucurbitaceae) ^C	Petola	Petola		•B	
159.	<i>Lygodium salicifolium</i> Presl. (Schizaeaceae) ^W	-	Pokok ribu-ribu	•		
160.	<i>Maclurochloa montana</i> (Ridl.) K. M. Wong (Poaceae) ^W	Buluh padi	-		•	
161.	<i>Mallotus</i> sp. (Euphorbiaceae) ^W	Pokok tembung	-	•		
162.	<i>Mangifera indica</i> L. (Anacardiaceae) ^C	-	Asam pelam		•	
163.	<i>Manihot esculenta</i> Crantz (Euphorbiaceae) ^C	Pokok ubi/ Pucuk ubi/ Ubi kayu	Pokok ubi/ Pucuk ubi/ Ubi kayu		•B	
164.	<i>Mapania</i> sp. (Cyperaceae) ^W	Mengkuang bantut	-	•		

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
165.	<i>Melastoma malabathricum</i> L. (Melastomataceae) ^C	-	Sekodok ungu	•		
166.	<i>Melastoma sanguineum</i> Sims. (Melastomataceae) ^C	Senduduk putih/ Kenduduk putih	Senduduk bunga putih/ Senduduk putih	•B		•M
167.	<i>Melastoma</i> sp. (Melastomataceae) ^C	-	Senduduk	•		
168.	<i>Melicope</i> sp. (Rutaceae) ^W	Tenggek burung	Pokok tenggek burung/ Pokok setenggek burung		•B	
169.	<i>Mikania cordata</i> (Burm. f.) B.L. Robins. (Asteraceae) ^W	Peria hantu/ Gentam/ Peria hutan/ Akar ulan	Peria hutan	•T	•M	
170.	<i>Mikania micrantha</i> Kunth (Asteraceae) ^W	Pokok mongol/ Akar ulan/ Daun ulan	-	•		
171.	<i>Milletia</i> sp. (Fabaceae) ^W	Pokok kabau	-	•		
172.	<i>Mimosa pudica</i> L. (Fabaceae) ^W	-	Pokok malu	•		
173.	<i>Mitragyna speciosa</i> (Korth.) Havil. (Rubiaceae) ^W	-	Daun ketum	•		
174.	<i>Molineria latifolia</i> (Dryand. ex W. T. Aiton) Herb. ex Kurz (Hypoxidaceae) ^W	Pokok lembak	Pokok kembak	•T	•B	
175.	<i>Momordica charantia</i> L. (Cucurbitaceae) ^C	-	Peria tikus/ Peria hutan/ Peria katak	•	•	
176.	<i>Morinda citrifolia</i> L. (Rubiaceae) ^C	-	Pokok mengkudu	•	•	
177.	<i>Morinda umbellata</i> L. (Rubiaceae) ^W	Akar pialu	-	•		
178.	<i>Muntingia calabura</i> L. (Muntingiaceae) ^C	Daun cere	-	•		
179.	<i>Murraya</i> sp. (Rutaceae) ^W	Kari hutan	-		•	
180.	<i>Musa acuminata</i> Colla (Musaceae) ^C	Pisang abu	Pisang abu	•T	•B	
181.	<i>Musa acuminata</i> x <i>balbisiana</i> Colla cv. 'Pisang Awak' (Musaceae) ^C	-	Pisang awak		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
182.	<i>Musa balbisiana</i> Colla (Musaceae) ^W	Pisang hutan/ Pisang jai/ Pisang cebok	Pisang hutan/ Pisang top	●T	●B	
183.	<i>Musa nana</i> Lour. (Musaceae) ^W	Pisang serendah	-		●	
184.	<i>Musa</i> sp. 1 (Musaceae) ^W	-	Pisang bakar	●	●	
185.	<i>Musa</i> sp. 2 (Musaceae) ^C	Pisang tok	-		●	
186.	<i>Musa</i> sp. 3 (Musaceae) ^C	-	Pisang berangan		●	
187.	<i>Nephelium lappaceum</i> L. (Sapindaceae) ^C	Rambutan	-		●	
188.	<i>Nypa fruticans</i> Wurmb (Arecaceae) ^W	-	Nipah	●	●	
189.	<i>Ochanostachys amentacea</i> Mast. (Olacaceae) ^W	Pokok ketaling/ Pokok kayu petaling	-	●	●	
190.	<i>Oenanthe javanica</i> (Blume) DC. (Apiaceae) ^{CW}	Pucuk minyak gas/ Pucuk tangki	Daun selom		●B	
191.	<i>Oncosperma horridum</i> (Griff.) Scheff. (Arecaceae) ^W	Bayas	-		●	
192.	<i>Oncosperma tigillarum</i> (Jack) Ridl. (Arecaceae) ^W	Pokok nibung	Pokok nibung		●B	
193.	<i>Orchidantha longiflora</i> Ridl. (Lowiaceae) ^W	Daun lebak	-	●		
194.	<i>Orthosiphon aristatus</i> (Blume) Miq. (Lamiaceae) ^C	Pokok misai kucing	Pokok misai kucing	●B		
195.	<i>Orthosiphon stamineus</i> Benth (Lamiaceae) ^C	-	Misai Kucing	●		
196.	<i>Paederia foetida</i> L. (Rubiaceae) ^W	Akar seth	-		●	
197.	<i>Pandanus</i> sp. 1 (Pandanaceae) ^W	Daun mengkuang ketam	-	●		
198.	<i>Pandanus</i> sp. 2 (Pandanaceae) ^W	-	Mengkuang			●
199.	<i>Pangium edule</i> Reinw. (Flacourtiaceae) ^W	Pokok kepayang	-		●	
200.	<i>Paramignya</i> sp. (Rutaceae) ^W	Cili bukit	-	●		
201.	<i>Parkia speciosa</i> Hassk. (Fabaceae) ^C	Pokok petai/ Cemok	Petai	●B	●B	
202.	<i>Passiflora foetida</i> L. (Passifloraceae) ^C	-	Pokok		●	
203.	<i>Peliosanthes</i> sp. (Asparagaceae) ^C	-	Bawang hutan/ Bawang nujuk	●	●	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
204.	<i>Peliosanthes teta</i> Andrews (Asparagaceae) ^W	Lembak biasa	-		•	
205.	<i>Pellacalyx axillaris</i> Korth. (Rhizophoraceae) ^W	Pokok kenunung/ Pokok kanau hutan	-		•	
206.	<i>Pereskia bleo</i> (Kunth) DC. (Cactaceae) ^C	Pokok jarum tujuh bilah/ Pokok bunga berduri/ Pokok jarum/ Pokok tujuh jarum	-	•	•	
207.	<i>Phaseolus vulgaris</i> L. (Fabaceae) ^C	Kacang buncis	-		•	
208.	<i>Phyllagathis rotundifolia</i> (Jack) Blume (Melastomataceae) ^W	Pokok serau malam/ Daun kura-kura/ Daun semalam	-	•		
209.	<i>Phyllanthus acidus</i> (L.) Skeels (Phyllanthaceae) ^C	-	Pokok cermai	•		
210.	<i>Phyllanthus amarus</i> Schumach. & Thonn. (Phyllanthaceae) ^W	-	Pokok dukung anak	•		
211.	<i>Phyllanthus niruri</i> L. (Phyllanthaceae) ^W	-	Dukung anak	•		
212.	<i>Phyllanthus</i> sp. (Phyllanthaceae) ^W	Sangkang hayam	-		•	
213.	<i>Phyllostachys aurea</i> Carr. ex A. & C. Rivière (Poaceae) ^W	Rebung	-		•	
214.	<i>Pinanga malaiana</i> (Mart.) Scheff. (Arecaceae) ^W	Pokok pinang legung	-	•	•	
215.	<i>Piper aduncum</i> L. (Piperaceae) ^W	Sirih cambai	-		•	
216.	<i>Piper betel</i> L. (Piperaceae) ^C	Sirih	Sirih	•B	•B	
217.	<i>Piper caninum</i> Blume (Piperaceae) ^W	Sirih hutan/ Pokok gao'	-		•	
218.	<i>Piper porphyrophyllum</i> N. E. Brown (Piperaceae) ^W	Sirih hantu/ Sirih rimau/ Sirih murai	-	•		
219.	<i>Piper sarmentosum</i> Roxb. (Piperaceae) ^W	Pokok kaduk	Pokok kaduk		•B	
220.	<i>Piper</i> sp. 1 (Piperaceae) ^W	Sirih camai	-	•		
221.	<i>Piper</i> sp. 2 (Piperaceae) ^W	-	Sireh kalong	•	•	
222.	<i>Piper</i> sp. 3 (Piperaceae) ^W	Sirih kemayong	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
223.	<i>Piper</i> sp. 4 (Piperaceae) ^W	Daun kadok hutan	-		•	
224.	<i>Piptospatha perakensis</i> (Engl.) Ridl. (Araceae) ^W	Pokok cacok	-		•	
225.	<i>Plagiostachys lateralis</i> Ridl. (Zingiberaceae) ^W	Pokok penduk	-	•		
226.	<i>Pleocnemia irregularis</i> (C. Presl) Holttum (Dryopteridaceae) ^W	Paku papan	-		•	
227.	<i>Poikilospermum suaveolens</i> (Blume) Merr. (Cecropiaceae) ^W	Akar setiawan	Pokok tawan	•B		
228.	<i>Polyalthia bullata</i> King (Annonaceae) ^W	Tongkat ali hitam	-	•		
229.	<i>Pometia pinnata</i> J. R. Frost. & G. Frost (Sapindaceae) ^W	Pokok kasai	-		•	
230.	<i>Pothos curtisii</i> Hook.f. (Araceae) ^W	Akar resdung	-	•		
231.	<i>Psidium guajava</i> L. (Myrtaceae) ^C	Pokok jambu batu/ Jambu	Pokok jambu batu	•B	•B	
232.	<i>Psophocarpus tetragonolobus</i> (L.) DC. (Fabaceae) ^C	Kacang botol	Kacang botol		•B	
233.	<i>Punica granatum</i> L. (Punicaceae) ^C	-	Buah delima	•	•	
234.	<i>Rhizophora apiculata</i> Blume (Rhizophoraceae) ^W	-	Bakau minyak		•	
235.	<i>Rhizophora mucronata</i> Lam. (Rhizophoraceae) ^W	-	Bakau kurap		•	
236.	<i>Rhodamnia</i> sp. (Myrtaceae) ^W	Pokok rohat	-		•	
237.	<i>Salacca zalacca</i> (Gaertn.) Voss (Arecaceae) ^W	-	Asam paya		•	
238.	<i>Sansevieria trifasciata</i> Prain (Asparagaceae) ^C	-	Bunga lidah buaya	•		
239.	<i>Santaloides rugosum</i> Kuntze (Connaraceae) ^W	Akar sembelit	-	•		
240.	<i>Saraca cauliflora</i> Baker (Fabaceae) ^W	Kasai	-		•	
241.	<i>Saraca declinata</i> Miq. (Fabaceae) ^W	Pokok kapih/ Pokok kapih api	-		•	
242.	<i>Saraca</i> sp. 1 (Fabaceae) ^W	Pucuk kapih	-		•	
243.	<i>Saraca</i> sp. 2 (Fabaceae) ^W	Pucuk kapih	-		•	
244.	<i>Saraca thaipingensis</i> Prain (Fabaceae) ^W	Pokok kapih biasa/ Kapih air/ Pokok kapih	-		•	
245.	<i>Sauropus androgynus</i> (L.) Merr. (Phyllanthaceae) ^C	Pucuk semanis	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
246.	<i>Schizostachyum brachycladum</i> Kurz (Poaceae) ^W	Buluh leman/ Buluh kuning	-		•	
247.	<i>Schizostachyum gracile</i> (Munro) Holttum (Poaceae) ^W	Buluh akar	-		•	
248.	<i>Scindapsus hederaceus</i> Miq. (Araceae) ^W	Akar lapar	-			•
249.	<i>Scorodocarpus borneensis</i> Becc. (Olacaceae) ^{CW}	Pokok kulim	-	•	•	
250.	<i>Senna alata</i> (L.) Roxb. (Fabaceae) ^{CW}	Gelenggang besar	Pokok gelenggang besar/ Pokok gelenggang	•B		
251.	<i>Senna obtusifolia</i> (L.) H. S. Irwin & Barneby (Fabaceae) ^W	Gelenggang kecil	-	•		
252.	<i>Senna tora</i> (L.) Roxb. (Fabaceae) ^{CW}	Daun gelenggang kecil	-	•		
253.	<i>Sesbania grandiflora</i> (L.) Pers. (Fabaceae) ^C	-	Pokok turi		•	
254.	<i>Smilax myosotiflora</i> A. DC. (Smilacaceae) ^W	Ubi jaga	-	•		
255.	<i>Smilax setosa</i> Miq. (Smilacaceae) ^W	Janggut baung	-	•		
256.	<i>Smilax</i> sp. (Smilacaceae) ^W	Majon	-		•	
257.	<i>Solanum ferox</i> L. (Solanaceae) ^C	-	Terung ulam Terung panjang/ Terung bulat/ Terung kecil	•	•	
258.	<i>Solanum melongena</i> L. (Solanaeae) ^C	-	Terung pipit/ Terung geret	•M	•B	
259.	<i>Solanum torvum</i> Sw. (Solanaceae) ^C	Terung leman/ Terung pipit	-		•	
260.	<i>Sonerila heterophylla</i> Jack (Melastomataceae) ^W	Asam puyuh	-		•	
261.	<i>Sonneratia caseolaris</i> (L.) Engl. (Sonneratiaceae) ^W	-	Pokok berembang/ Bembang/ Asam bumbang/ Bumbang Gedabu/ Asam dabu/ Pokok dabu	•	•	
262.	<i>Sonneratia ovata</i> Backer (Sonneratiaceae) ^W	-	-	•	•	
263.	<i>Spilanthes paniculata</i> Wall.ex DC. (Asteraceae) ^W	Bunga sakit gigi	-	•		

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
264.	<i>Spondias dulcis</i> Parkinson (Anacardiaceae) ^C	Pokok kedondong	-	•		
265.	<i>Stenochlaena palustris</i> (Burm.f.) Bedd. (Blechnaceae) ^W	Paku larat	Heleh/ Pucuk paku merah/ He'le/ Paku merah/ Paku hele'/ Paku/ Pucuk paku	•M	•B	
266.	<i>Styphelia malayana</i> (Jack) Spreng. (Epacridaceae) ^W	Pokok perapat	-	•		
267.	<i>Syzygium polyanthum</i> (Wight) Walp. (Myrtaceae) ^{CW}	Pucuk salam	-		•	
268.	<i>Syzygium</i> sp. (Myrtaceae) ^W	Pokok jambu hutan	-	•		
269.	<i>Tacca integrifolia</i> Ker Gawl. (Dioscoreaceae) ^W	Pokok kelembun	-	•		
270.	<i>Tacca</i> sp. (Dioscoreaceae) ^W	Lebak merah	-	•		
271.	<i>Tamarindus indica</i> L. (Fabaceae) ^C	-	Asam jawa		•	
272.	<i>Tetracera indica</i> Merr. (Dilleniaceae) ^W	Akar mempelas/ Sempelas pusung	-	•		
273.	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson (Menispermaceae) ^W	-	Patawali	•	•	
274.	<i>Trevesia burckii</i> Boerl. (Araliaceae) ^W	Pokok kia'	-	•		
275.	<i>Uncaria lanosa</i> Wall. (Rubiaceae) ^W	-	Akar kait	•		
276.	<i>Uncaria</i> sp. (Rubiaceae) ^W	Gambir melaka	-	•	•	
277.	<i>Urophyllum</i> sp. (Rubiaceae) ^W	Pokok penggugur	-	•		
278.	<i>Vernonia javanica</i> DC. (Asteraceae) ^W	Pokok kepialu	-	•		
279.	<i>Vigna unguiculata</i> subsp. <i>sesquipedalis</i> (L.) Verdc. (Fabaceae) ^C	Kacang panjang	-		•	
280.	<i>Vitex pubescens</i> Vahl. (Verbenaceae) ^W	Pucuk leban	Pokok leban		•B	
281.	<i>Wikstroemia ridleyi</i> Gamble (Thymelaeaceae) ^W	Pucuk depu	-		•	
282.	<i>Xylocarpus moluccensis</i> (Imk.) Roem. (Meliaceae) ^W	-	Nyireh batu			•
283.	<i>Zea mays</i> L. (Poaceae) ^C	Jagung	-		•	

Table 4.1: (continued)

No.	Botanical Name	Temuan name	Mah Meri name	M	F	S
284.	<i>Zingiber montanum</i> (J. König) Link ex A. Dietr. (Zingiberaceae) ^C	Bonglai	-	●		●
285.	<i>Zingiber officinale</i> Roscoe (Zingiberaceae) ^C	Halia	-	●		
286.	<i>Zingiber puberulum</i> Ridl. (Zingiberaceae) ^W	Pokok tepus balak	-	●		
287.	<i>Zingiber spectabile</i> Griff. (Zingiberaceae) ^W	Pokok tepus cadak/ Pokok carak/ Tepus carak	-	●	●	

- M Utilized for medicinal purpose
- F Utilized for consumption purpose
- S Utilized for spiritual purpose
- ^C Cultivated
- ^w Wild
- ^{cw} Cultivated and wild
- Was not utilized by the tribe in the study
- Utilized for the specific purposes
- B Utilized by both Temuan and Mah Meri for that specific purpose
- T Utilized by the Temuan only for that specific purpose
- M Utilized by the Mah Meri only for that specific purpose

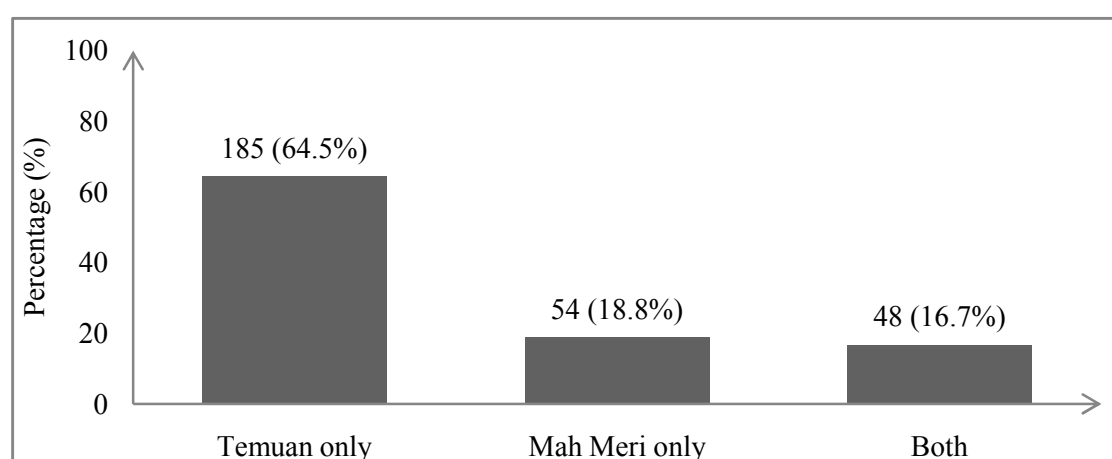


Figure 4.1: Numbers and percentages of plant species used by the Temuan and Mah Meri tribes

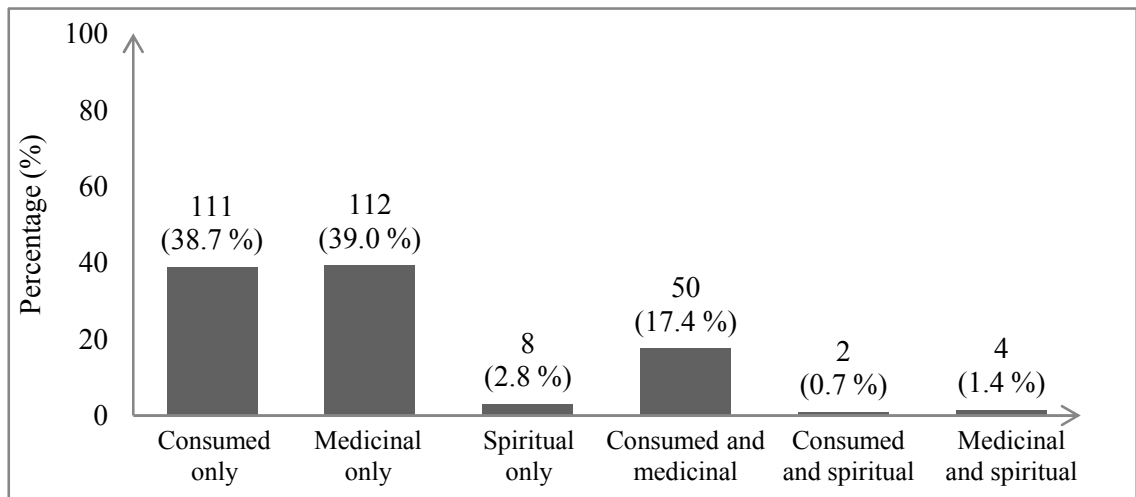


Figure 4.2: Numbers and percentages of each category of plant species utilization by the Orang Asli in Selangor

4.2 Utilization of Mushroom Species by the Mah Meri and Temuan Tribes

Table 4.2 shows the list of mushroom species categorized according to their utilization. Twenty-eight species of mushrooms from 14 families were used. Polyporaceae family was dominantly used by both Mah Meri and Temuan tribes with seven species (25.0 %). This was followed by Ganodermataceae, Lyophyllaceae and Sarcophycaceae with three species, each (10.7 %, each). The third most dominantly used families were Xylariaceae and Agaricaceae with two species of mushrooms, each (7.1 %, each).

Generally, the total numbers of species used by the Temuan were 27 species while Mah Meri, six species. Five species of mushrooms were used by both tribes revealing that 22 species were used only by the Temuan and one species by the Mah Meri (Figure 4.3).

With regard to its utilization, 18 species of mushrooms were used for consumption and 14 species of mushrooms for medicine. Only one species of mushroom was used for spiritual purpose namely *Amauroderma* sp. (Figure 4.4). Five species of mushrooms meanwhile were used by the Orang Asli both as food and as

medicine (Figure 4.4). All 28 mushroom species were collected by the Orang Asli in the forest near their settlements or their houses.

The similarity coefficient calculated using Jaccard Index (JI) resulted 0.18. This revealed low similarity of mushroom species used by both tribes.

Table 4.2: List of mushroom species and its utilization by the tribes documented in this study

No.	Mycological Name	Temuan Name	Mah Meri Name	M	F	S
1.	<i>Agaricus moelleri</i> Wasser (Agaricaceae) ^W	Cendawan susu pelanduk	-		•	
2.	<i>Amauroderma</i> sp. (Ganodermataceae) ^W	Cendawan sawan	-			•
3.	<i>Auricularia auricula-judae</i> (Bull.) Quéf. (Auriculariaceae) ^W	Cendawan memeh/ Cendawan telinga beruk/ Cendawan lebung/ Cendawan terbebeh	Cendawan bebek/ Petih bebek/ Cendawan memeh/ Cendawan telinga kelawar/ Petih telinga kelawar/ Cendawan telinga monyet	•B	•B	
4.	<i>Calvatia craniiformis</i> (Schw.) Fr. (Lycoperdaceae) ^W	Cendawan pau	-		•	
5.	<i>Cantharellus</i> sp. (Cantharellaceae) ^W	Cendawan raja	-		•	
6.	<i>Clavulina</i> sp. (Clavulinaceae) ^W	Cendawan merbau/ Cendawan pokok merbau/ Cendawan batang	-		•	
7.	<i>Cookeina speciosa</i> (Fr.) Dennis (Sarcoscyphaceae) ^W	Cendawan mangkuk	-	•		
8.	<i>Cookiena</i> sp. (Sarcoscyphaceae) ^W	Cendawan mangkuk	-	•		
9.	<i>Cookiena sulcipes</i> (Berk.) Kuntz (Sarcoscyphaceae) ^W	Cendawan mangkuk	-	•		
10.	<i>Coprinus</i> sp. (Agaricaceae) ^W	Cendawan kaki satu	-	•		

Table 4.2: (continued)

No.	Mycological Name	Temuan Name	Mah Meri Name	M	F	S
11.	<i>Filoboletus manipularis</i> (Berk.) Singer (Tricholomataceae) ^W	Cendawan butang	-		•	
12.	<i>Ganoderma australe</i> (Fr.) Pat. (Ganodermataceae) ^W	Cendawan certing	-	•		
13.	<i>Ganoderma</i> sp. (Ganodermataceae) ^W	Cendawan dinding	-	•		
14.	<i>Hygrocybe conica</i> (Scop.) P. Kumm. (Hygrophoraceae) ^W	Cendawan kaki tiong/ Cendawan tiong	-		•	
15.	<i>Lentinus connatus</i> Berk. (Polyporaceae) ^W	Cendawan takau	-		•	
16.	<i>Lentinus sajor-caju</i> (Fr.) Fr. (Polyporaceae) ^W	Cendawan cicar	-		•	
17.	<i>Lentinus squarrosulus</i> Mont. (Polyporaceae) ^W	Cendawan putih/ Cendawan putih mata/ Cendawan tunggul/ Cendawan sial	Petih putih		•B	
18.	<i>Lentinus strigosus</i> (Schwein) Fr. (Polyporaceae) ^W	Cendawan telinga beruk/ Cendawan memeh	-		•	
19.	<i>Lignosus rhinocerotis</i> (Cooke) Ryvarden (Polyporaceae) ^W	Cendawan susu harimau	Petih a'a	•B	•T	
20.	<i>Microporus xanthopus</i> (Fr.) Kuntze (Polyporaceae) ^W	Cendawan kelentik kering/ Cendawan kerting kering/ Cendawan kerteh kering/ Cendawaan pengering/ Cendawan matahari/ Cendawan kering/ Cendawan perapat	-	•	•	
21.	<i>Pycnoporus sanguineus</i> (L.) Murill (Polyporaceae) ^W	Cendawan mata/ Cendawan be'reng/ Cendawan bereh	-	•		

Table 4.2: (continued)

No.	Mycological Name	Temuan Name	Mah Meri Name	M	F	S
22.	<i>Schizophyllum commune</i> Fr. (Schizophyllaceae) ^W	Cendawan kukur/ Cendawan kerang/ Cendawan kokor	Cendawan kokor/ Cendawan kukuh/ Cendawan kukur/ Petih kukuh/ Petih kukur		●B	
23.	<i>Termitomyces clypeatus</i> R. Heim (Lyophyllaceae) ^W	Cendawan pelanduk kancil/ Cendawan busut/ Cendawan susu pelanduk/ Cendawan susu	-	●	●	
24.	<i>Termitomyces heimii</i> Natarajan (Lyophyllaceae) ^W	Cendawan busut/ Cendawan tahun	Cendawan guruh/ Petih busut/ Petih guruh/ Cendawan busut		●B	
25.	<i>Termitomyces microcarpus</i> (Berk & Broome) R. Heim (Lyophyllaceae) ^W	Cendawan susu pelanduk/ Cendawan melukut/ Cendawan kaki pelanduk/ Cendawan	-		●	
26.	<i>Volvariella volvacea</i> (Bull.) Singer (Pluteaceae) ^W	-	Cendawan tandan kelapa sawit/ Cendawan kelapa sawit/ Cendawan tandan/ Cendawan kelapa sawit	●	●	
27.	<i>Xylaria polymorpha</i> (Pers.) Grev. (Xylariaceae) ^W	Cendawan harimau/ Cendawan kemaluan musang	-	●		
28.	<i>Xylaria</i> sp. (Xylariaceae) ^W	Cendawan punjut	-	●		

M Utilized for medicinal purpose

F Utilized for consumption purpose

S Utilized for spiritual purpose

^W Wild

- Was not utilized by the tribe in the study

● Utilized for the specific purposes

●B Utilized by both Temuan and Mah Meri for that specific purpose

●T Utilized by the Temuan only for that specific purpose

●M Utilized by the Mah Meri only for that specific purpose

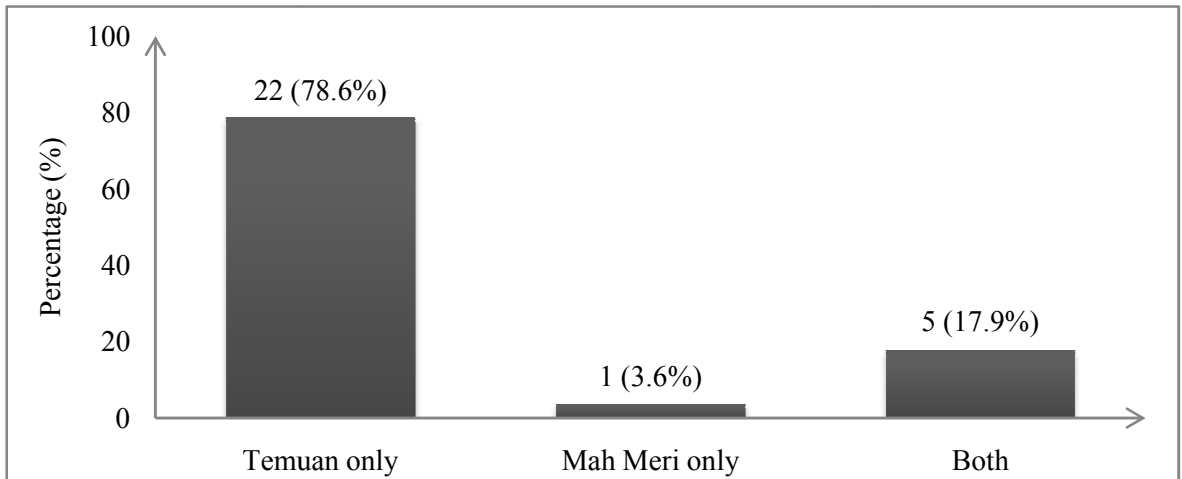


Figure 4.3: Numbers and percentages of mushroom species used by the Temuan and Mah Meri tribes

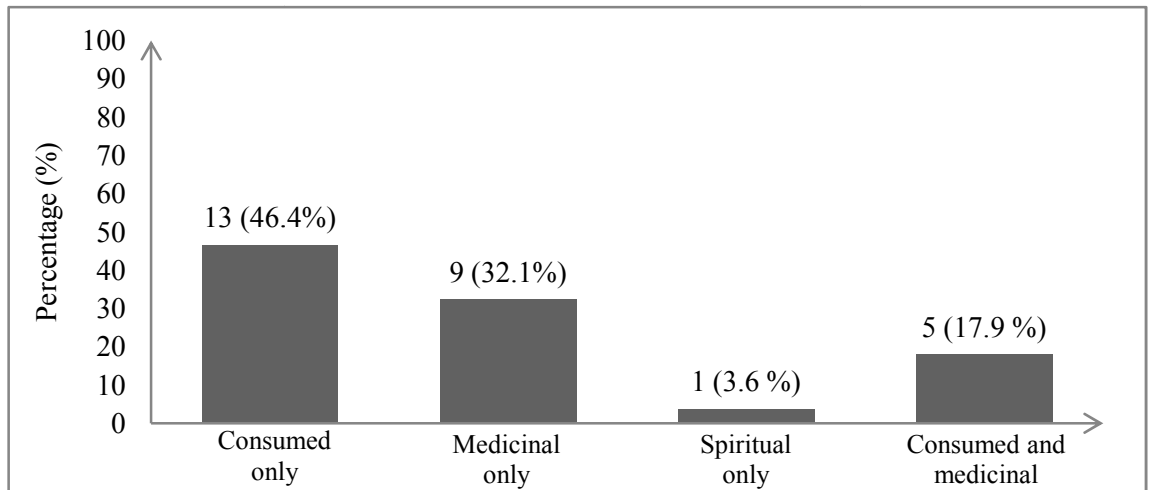


Figure 4.4: Numbers and percentages of each category of mushroom species utilization by the Orang Asli in Selangor

4.3 Utilization of Animal Species by the Mah Meri and Temuan Tribes

Table 4.3 shows the list of animal species used by both tribes for consumption, medicine and spiritual purpose. Generally, the total numbers of animal species utilized were 231 species from 114 families. Sciuridae family was dominantly used with 16 species (6.9 %), followed by Cyprinidae with 14 species (6.1 %) and; Cercopithecidae and Channidae with seven species (3.0 %), each.

Out of the total number of species utilized, 180 species of animals were used by the Temuan and 105 species of animals by the Mah Meri. Relatively, 54 species of animals were used by both tribes (Figure 4.5).

The majority of the animal species recorded in this study were used as food with 211 species of animals. This was followed by medicinal and spiritual purpose with 47 and 8 species of animals, respectively. Similar to the plants and mushrooms, these animal species were also inter-utilized with one another (13.9 %). Although unlike plants and mushrooms, three species of animals were used by both tribes as food, medicine and spiritual purpose. These species were *Channa striata*, *Cuora amboinensis* and *Hystrix brachyura* (Table 4.3). In addition, inter-utilization of animal species were also observed between consumed and medicinal (10.8 %); medicinal and spiritual (0.4 %) and; consumed and spiritual purpose (1.3 %) (Figure 4.6).

Only six species (2.6 %) were reared. These species were used for consumption only. Specifically *Anadara* sp., *Anas* sp., *Anser cygnoides*, *Bos taurus*, *Capra hircus* and *Gallus domesticus* (Table 4.3). Other species of animals were obtained in the wild with 225 species of animals (97.4 %). Nevertheless, no animal species were both obtained from the wild and reared at the same time except as pet, such as *N. coucang* and *Macaca nemestrina*.

The result of similarity coefficient calculated using Jaccard Index (JI) shows 0.23. Similar to plant and mushroom species, low similarity of animal species were shown between both Mah Meri and Temuan tribes.

Table 4.3: List of animal species and its utilization by the tribes documented in this study

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
1.	<i>Achatina fulica</i> Ferussac (Achatinidae) ^W	Siput babi	Siput babi	●B		

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
2.	<i>Acridotheres grandis</i> Moore (Sturnidae) ^W	Burung tiong	-		•	
3.	<i>Acrossocheilus</i> <i>deuratus</i> Cuvier & Valenciennes (Cyprinidae) ^W	Ikan daun	-		•	
4.	<i>Aeromys tephromelas</i> Günther (Sciuridae) ^W	Tupai terbang	-		•	
5.	<i>Amaurornis</i> <i>phoenicurus</i> Pennant (Rallidae) ^W	Burung guang/ Wakwak	Burung wakwak		•B	
6.	<i>Amblyceps mangois</i> Hamilton (Amblycipitidae) ^W	Ikan keli sungai	-		•	
7.	<i>Anabas testudineus</i> Bloch (Anabantidae) ^W	Ikan puyu/ Ikan puyuh	-		•	
8.	<i>Anadara</i> sp. (Arcidae) ^C	-	Kerang		•	
9.	<i>Anas</i> sp. (Anatidae) ^C	Itik	Itik		•B	
10.	<i>Anodontostoma</i> <i>chacunda</i> Hamilton- Buchanan (Clupeidae) ^W	-	Ikan selangat		•	
11.	<i>Anser cygnoides</i> L. (Anatidae) ^C	Angsa	Angsa		•B	
12.	<i>Anthracoceros</i> <i>albirostris</i> Shaw (Bucerotidae) ^W	Kangait/ Kalau/ Burung raya	-		•	
13.	<i>Anthreptes malacensis</i> Scopoli (Nectariniidae) ^W	Burung isan'ik/ Burung isait/ Kelicap	-		•	
14.	<i>Anthus</i> <i>novaeseelandiae</i> J. F. Gmelin (Motacillidae) ^W	Burung taren	-		•	
15.	<i>Apis</i> sp. (Apidae) ^W	-	Lebah	•	•	
16.	<i>Apus affinis</i> J. E. Gray (Apodidae) ^W	Burung layang/ Burung la'yan	-		•	
17.	<i>Arachnothera</i> <i>longirostra</i> Latham (Nectariniidae) ^W	Burung isak	-		•	
18.	<i>Arctictis binturong</i> Raffles (Viverridae) ^W	Musang pandan/ Binturong/ Musang buah/ Musang menturun/ Musang/ Ijok/ Musang sempang/ Musang turun	-		•	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
19.	<i>Arctogalidia trivirgata</i> Gray (Viverridae) ^W	Musang akar/ Langkap/ Musang aleau/ Musang	-		•	
20.	<i>Argusianus argus</i> L. (Phasianidae) ^W	Burung kuang/ Kuang Temboin/ Landak nibung/ Landak batu/ Landak kecil/ Landak	-		•	
21.	<i>Atherurus macrourus</i> L. (Hystricidae) ^W	Landak nibung/ Landak batu/ Landak kecil/ Landak	Landak	•M	•B	
22.	<i>Atule mate</i> Cuvier (Carangidae) ^W	-	Ikan selar		•	
23.	<i>Barbonymus schwanenfeldii</i> Bleeker (Cyprinidae) ^W	Ikan lampiran	-		•	
24.	<i>Batagur affinis</i> Cantor (Geoemydidae) ^W	Tempaya	-		•	
25.	<i>Batagur baska</i> Gray (Geoemydidae) ^W	Jelebau	-		•	
26.	<i>Bos taurus</i> L. (Bovidae) ^C	Lembu	Lembu		•B	
27.	<i>Bubulcus ibis</i> L. (Ardeidae) ^W	Burung pocong	-		•	
28.	<i>Buceros bicornis</i> L. (Bucerotidae) ^W	Burung enggang	-		•	
29.	<i>Buceros rhinoceros</i> L. (Bucerotidae) ^W	Burung enggang	-		•	
30.	<i>Callosciurus caniceps</i> Gray (Sciuridae) ^W	Tupai ceguk/ Tupai kelapa sawit	Tupai		•B	
31.	<i>Callosciurus nigrovittatus</i> Horsfield (Sciuridae) ^W	Tupai pecong	Tupai		•B	
32.	<i>Callosciurus notatus</i> Boddaert (Sciuridae) ^W	Tupai/ Tupai merah/ Tupai dalik/ Tupai miah	Tupai	•T	•B	
33.	<i>Callosciurus prevostii</i> Desmarest (Sciuridae) ^W	Tupai mengas/ Tupai belang/ Tupai	Tupai kulit kelapa/ Tupai paeung	•M	•B	
34.	<i>Capra hircus</i> L. (Bovidae) ^C	Kambing	Kambing		•B	
35.	<i>Caprimulgus macrurus</i> Horsfield (Caprimulgidae) ^W	Burung tukang	-		•	
36.	<i>Centropus bengalensis</i> Gmelin (Cuculidae) ^W	Burung butbut Butbut kecil/ Pegam	Burung butbut kecil	•B	•T	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
37.	<i>Centropus rectunguis</i> Strickland (Cuculidae) ^W	-	Burung butbut	•		
38.	<i>Centropus sinensis</i> Stephens (Cuculidae) ^W	Butbut besar	Burung tagut/ Gutgut besar	•M	•T	
39.	<i>Cephalocassis</i> <i>borneensis</i> Bleeker (Ariidae) ^W	-	Ikan duri		•	
40.	<i>Cervus unicolor</i> Kerr. (Cervidae) ^W	Rusa	Rusa	•M	•B	
41.	<i>Chalcophaps indica</i> L. (Columbidae) ^W	Burung punai	Burung kocon'k/ Burung punai		•B	
42.	<i>Channa gachua</i> Hamilton (Channidae) ^W	Ikan kedap/ Ikan	-	•		
43.	<i>Channa lucius</i> Cuvier & Valenciennes (Channidae) ^W	Ikan bujur	-		•	
44.	<i>Channa micropeltes</i> Cuvier & Valenciennes (Channidae) ^W	Ikan tuman	-		•	
45.	<i>Channa</i> sp. 1 (Channidae) ^W	Ikan haruan	-		•	
46.	<i>Channa</i> sp. 2 (Ophiocephalidae) ^W	Ikan haruan bujut	-	•		
47.	<i>Channa</i> sp. 3 (Ophiocephalidae) ^W	Ikan haruan hitam	-	•		
48.	<i>Channa striata</i> Bloch (Channidae) ^W	Ikan haruan/ Ikan landang/ Ikan haruan biasa	Ikan haruan	•B	•B	•T
49.	<i>Chirocentrus dorab</i> Forsskål (Chirocentridae) ^W	-	Ikan cabuk		•	
50.	<i>Chiropodomys</i> <i>gliroides</i> Blyth (Muridae) ^W	Tikus buluh/ Tikus	-		•	
51.	<i>Clarias nieuhofii</i> Valenciennes (Clariidae) ^W	Ikan limbat	-		•	
52.	<i>Clarias</i> sp. (Clariidae) ^W	Ikan keli	-		•	
53.	<i>Coilia dussumieri</i> Valenciennes (Engraulidae) ^W	-	Ikan bulu ayam		•	
54.	<i>Collocalia esculenta</i> L. (Apodidae) ^W	Burung layang/ Burung la'yan	-		•	
55.	<i>Columba livia</i> Gmelin (Columbidae) ^W	Burung merpati	-		•	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
56.	<i>Copsychus malabaricus</i> Scopoli (Muscicapidae) ^W	Burung garut	Murai hutan	●M	●T	
57.	<i>Coturnix coturnix</i> L. (Phasianidae) ^W	Burung puyuh	Burung puyuh		●B	
58.	<i>Cultellus attenuatus</i> Dunker (Pharidae) ^W	-	Siput pahat/ Siput buluh		●	
59.	<i>Cuora amboinensis</i> Daudin (Geoemydidae) ^W	Kura-kura katup/ Kura-kura	Kura-kura mangkuk/ Kura-kura temahang/ Kura-kura	●B	●B	●M
60.	<i>Cynoglossus arel</i> Bloch & Schneider (Cynoglossidae) ^W	-	Ikan lidah daun		●	
61.	<i>Cynoglossus puncticeps</i> Richardson (Cynoglossidae) ^W	-	Ikan sebelah		●	
62.	<i>Cynoglossus</i> sp. (Cynoglossidae) ^W	Ikan sebelah	-		●	
63.	<i>Dendrocygna javanica</i> Horsfield (Anatidae) ^W	Itik air/ Belibis	Itik hutan		●B	
64.	<i>Dicaeum cruentatum</i> L. (Nectariniidae) ^W	Burung kumang	-		●	
65.	<i>Dicerorhinus sumatrensis</i> Fischer (Rhinocerotidae) ^W	Badak	-		●	
66.	<i>Dinopium javanense</i> Ljugh (Picidae) ^W	Burung belatuk/ Teki'l	-	●	●	
67.	<i>Dremomys rufigenis</i> Blanford (Sciuridae) ^W	Tupai kerok/ Tupai	-		●	
68.	<i>Dryocopus javensis</i> Horsfield (Picidae) ^W	Burung belatuk	-	●		
69.	<i>Egretta</i> sp. (Ardeidae) ^W	Bangau	-		●	
70.	<i>Elephas maximus</i> L. (Elephantidae) ^W	Gajah	-		●	
71.	<i>Eleutheronema tetradactylum</i> Shaw (Polynemidae) ^W	-	Ikan senangin		●	
72.	<i>Epalzeorhynchus kalopterus</i> Bleeker (Cyprinidae) ^W	Ikan selimang	-		●	
73.	<i>Eurystomus orientalis</i> L. (Coraciidae) ^W	Tiong batu	-		●	
74.	<i>Felis catus</i> L. (Felidae) ^W	-	Kucing hitam	●		
75.	<i>Fenneropenaeus merguensis</i> De Man (Penaeidae) ^W	-	Udang jaring/ Udang putih		●	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
76.	<i>Gallinula chloropus</i> L. (Rallidae) ^W	Tiong air	-		•	
77.	<i>Gallus domesticus</i> Höns (Phasianidae) ^C	Ayam	Ayam		•B	
78.	<i>Gallus gallus</i> L. (Phasianidae) ^W	Ayam hutan	Ayam hutan	•M	•B	
79.	<i>Geopelia striata</i> L. (Columbidae) ^W	Burung punai hutan	Burung merbok		•B	
80.	<i>Gracula religiosa</i> L. (Sturnidae) ^W	Burung tiong hutan	Burung tiong		•B	
81.	<i>Gymnura poecilura</i> Shaw (Gymnuridae) ^W	-	Ikan pari tembikar/ Ikan pari kelawar		•	
82.	<i>Halcyon smyrnensis</i> L. (Halcyonidae) ^W	Burung udang	-		•	
83.	<i>Haliastur indus</i> Boddaert (Accipitridae) ^W	Burung helang ayam	-		•	
84.	<i>Hampala</i> <i>macrolepidota</i> van Hasselt (Cyprinidae) ^W	Ikan sebarau	-		•	
85.	<i>Harpactes</i> <i>kasumba</i> Raffles (Trogonidae) ^W	Burung hudang	-		•	
86.	<i>Helarctos malayanus</i> Raffles (Ursidae) ^W	Beruang	Beruang	•T	•B	
87.	<i>Himantura</i> sp. (Dasyatidae) ^W	-	Ikan tuka		•	
88.	<i>Hippocampus</i> sp. (Syngnathidae) ^W	-	Kuda laut	•		
89.	<i>Hirundo daurica</i> L. (Hirundinidae) ^W	Burung layang/ Burung la'yan/ Layang-layang	-	•	•	
90.	<i>Hirundo tahitica</i> Gmelin (Hirundinidae) ^W	Burung layang/ Burung la'yan	-		•	
91.	<i>Hylobates lar</i> L. (Hylobatidae) ^W	Tembok/ Ungka/ Lotong	-	•	•	
92.	<i>Hylobates</i> sp. (Hylobatidae) ^W	Ungka	Monyet		•M	•T
93.	<i>Hylobates syndactylus</i> Raffles (Hylobatidae) ^W	Siamang	-		•	
94.	<i>Hylopetes lepidus</i> Horsfield (Sciuridae) ^W	Tupai	-		•	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
95.	<i>Hystrix brachyura</i> L. (Hystricidae) ^W	Landak biasa/ Landak/ Landak raya/ Landak besar	Landak	●T	●B	●M
96.	<i>Ilisha pristigastroides</i> Bleeker (Pristigasteridae) ^W	-	Ikan puput		●	
97.	<i>Ilisha</i> sp. (Pristigasteridae) ^W	-	Ikan beliak mata		●	
98.	<i>Iomys horsfieldii</i> Waterhouse (Sciuridae) ^W	Tupai terbang/ Kubong/ Keluang/ Tupai	Tupai		●B	
99.	<i>Irena puella</i> Latham (Irenidae) ^W	Burung tinjang galah	-		●	
100.	<i>Irmengardia</i> <i>pilosimana</i> Roux (Gecarcinucidae) ^W	-	Ketam imai	●		
101.	<i>Johnius</i> <i>amblycephalus</i> Bleeker (Sciaenidae) ^W	-	Ikan gelama		●	
102.	<i>Lariscus insignis</i> F. Cuvier (Sciuridae) ^W	Tupai	-		●	
103.	<i>Lepidochelys</i> <i>olivacea</i> Eschscholtz (Cheloniidae) ^W	-	Kura-kura	●		
104.	<i>Leptobarbus hoevenii</i> Bleeker (Cyprinidae) ^W	Ikan jelawat	-		●	
105.	<i>Limnonectes blythii</i> Boulenger (Dicroglossidae) ^W	Katak behong/ Katak guguh/ Katak	-		●	
106.	<i>Limulus polyphemus</i> L. (Limulidae) ^W	-	Belangkas			●
107.	<i>Lonchura malacca</i> L. (Estrildidae) ^W	Burung kerak	-		●	
108.	<i>Lonchura punctulata</i> L. (Estrildidae) ^W	Burung pipit	-		●	
109.	<i>Lophura</i> <i>erythrophthalma</i> Raffles (Phasianidae) ^W	Pucong/ Pega	-		●	
110.	<i>Loriculus galgulus</i> L. (Psittacidae) ^W	Burung selindit	Serindit		●B	
111.	<i>Macaca arctoides</i> I. Geoffroy Saint- Hilaire (Cercopithecidae) ^W	Beruk	-		●	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
112.	<i>Macaca fascicularis</i> Raffles (Cercopithecidae) ^W	Tembok/ Kera/ Monyet	Yen		●B	
113.	<i>Macaca nemestrina</i> L. (Cercopithecidae) ^W	Beruk/ Trup	Beruk		●B	
114.	<i>Macrobrachium</i> <i>rosenbergii</i> de Man (Palaemonidae) ^W	Udang galah	-		●	
115.	<i>Macrobrachium</i> sp. (Palaemonidae) ^W	Udang sungai	-		●	
116.	<i>Malacocincla abbotti</i> Blyth (Timaliidae) ^W	Burung hutan	-		●	
117.	<i>Manis javanica</i> Desmarest (Manidae) ^W	Kondok/ Tenggiling	Tenggiling		●B	●B
118.	<i>Megalaima</i> <i>chrysopogon</i> Temminck (Ramphastidae) ^W	Burung telung	-		●	
119.	<i>Megalaspis cordyla</i> L. (Carangidae) ^W	-	Ikan cencaru		●	
120.	<i>Merops philippinus</i> L. (Meropidae) ^W	Burung keyok	-		●	
121.	<i>Metapenaeus</i> <i>lysianassa</i> De Man (Penaeidae) ^W	Udang kecil	-		●	
122.	<i>Monopterus albus</i> Zuiew (Synbranchidae) ^W	-	Belut	●		
123.	<i>Muntiacus muntjak</i> Zimmermann (Cervidae) ^W	Kijang/ Rusa	Kijang	●T	●B	
124.	<i>Mystacoleucus</i> <i>marginatus</i> Cuvier & Valenciennes (Cyprinidae) ^W	Ikan siak	-		●	
125.	<i>Mystus baramensis</i> Regan (Bagridae) ^W	Ikan mangit	-		●	
126.	<i>Mystus nigriceps</i> Cuvier & Valenciennes (Bagridae) ^W	Ikan baung pisang	-		●	
127.	<i>Mystus vittatus</i> Bloch (Bagridae) ^W	Ikan baung	-		●	
128.	<i>Naemorhedus</i> <i>sumatraensis</i> Bechstein (Bovidae)	Kambing gurun/ Kambing hutan/ Kambing batu/ Unggang	Kambing hutan	●T	●B	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
129.	<i>Nandus nebulosus</i> Gray (Nandidae) ^W	Ikan tamil	-		•	
130.	<i>Neolissochilus hexagonolepis</i> McClelland (Cyprinidae) ^W	Ikan tengas	-		•	
131.	<i>Neolissochilus soroides</i> Duncker (Cyprinidae) ^W	Ikan tengas	-		•	
132.	<i>Notochelys platynota</i> Gray (Geoemydidae) ^W	Kura-kura	-		•	
133.	<i>Nycticebus coucang</i> Boddaert (Loridae) ^W	Kokang/ Kukang/ Kongkang	Kongkang/ Kukang	•B	•B	
134.	<i>Ocypode</i> sp. (Ocypodidae) ^W	-	Ketam linjung/ Ketam putih		•	
135.	<i>Oreochromis</i> sp. (Cichlidae) ^W	Ikan tilapia kecil	-		•	
136.	<i>Oriolus chinensis</i> L. (Oriolidae) ^W	Burung sagung	-		•	
137.	<i>Oriolus xanthonotus</i> Horsfield (Oriolidae) ^W	Burung dendang	-		•	
138.	<i>Orlitia borneensis</i> Gray (Geoemydidae) ^W	Baning	-		•	
139.	<i>Orthotomus sutorius</i> Pennant (Sylviidae) ^W	Burung gelecet/ Burung gelecek	-		•	
140.	<i>Oryctolagus</i> sp. (Leporidae) ^W	Arnab	-		•	
141.	<i>Otolithes ruber</i> Bloch & Schneider (Sciaenidae) ^W	-	Ikan gelama gigi		•	
142.	<i>Paguma larvata</i> C. E. H. Smith (Viverridae) ^W	Musang merah	Musang		•B	
143.	<i>Pampus argenteus</i> Euphrasen (Stromateidae) ^W	-	Ikan bawal		•	
144.	<i>Pangasius pangasius</i> Hamilton (Pangasiidae) ^W	Ikan patin	-		•	
145.	<i>Panthera pardus</i> L. (Felidae) ^W	Harimau kumbang	-		•	
146.	<i>Panthera tigris</i> L. (Felidae) ^W	Harimau	Harimau		•B	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
147.	<i>Paradoxurus hermaphroditus</i> Pallas (Viverridae) ^W	Musang aliau/ Musang pandan/ Chekong/ Musang/ Musang turun	Musang/ Musang pandan/ Musang kecil		●B	
148.	<i>Paratrypauchen microcephalus</i> Bleeker (Gobiidae) ^W	-	Tilan	●		
149.	<i>Passer montanus</i> L. (Passeridae) ^W	Burung kedekok/ Burung pipit	-		●	
150.	<i>Pelargopsis capensis</i> L. (Alcedinidae) ^W	Burung cincang galah	-		●	
151.	<i>Pelodiscus sinensis</i> Wiegmann (Trionychidae) ^W	Kura-kura sungai	-		●	
152.	<i>Penaeus monodon</i> Fabricius (Penaeidae) ^W	-	Udang harimau		●	
153.	<i>Penaeus</i> sp. (Penaeidae) ^W	-	Udang		●	
154.	<i>Periopthalmus</i> sp. (Gobiidae) ^W	-	Ikan tembakul	●		
155.	<i>Petaurista petaurista</i> Pallas (Sciuridae) ^W	Tupai terbang/ Kandau	-		●	
156.	<i>Picus puniceus</i> Horsfield (Picidae) ^W	Burung belatuk	-	●		
157.	<i>Pisodonophis cancrivorus</i> Richardson (Ophichthidae) ^W	-	Ikan malung	●		
158.	<i>Ploceus philippinus</i> L. (Ploceidae) ^W	Burung tempua	-		●	
159.	<i>Plotosus canius</i> Hamilton (Plotosidae) ^W	Ikan sembilang	-		●	
160.	<i>Polymesoda expansa</i> Mousson (Corbiculidae) ^W	-	Lokan		●	
161.	<i>Polymesoda</i> sp. (Corbiculidae) ^W	-	Kepah		●	
162.	<i>Poropuntius deauratus</i> Valenciennes (Cyprinidae) ^W	Ikan daun	-		●	
163.	<i>Poropuntius</i> sp. (Cyprinidae) ^W	Ikan daun	-		●	
164.	<i>Portunus pelagicus</i> L. (Portunidae) ^W	-	Ketam		●	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
165.	<i>Prebystis cristata</i> Raffles (Cercopithecidae) ^w	Kengkong/ Monyet/ Lotong	-		•	
166.	<i>Prebystis melalophos</i> Raffles (Cercopithecidae) ^w	Senekah/ Sikah/ Cenekah/ Pamtem	-		•	
167.	<i>Prebystis obscura</i> Reid (Cercopithecidae) ^w	Lotong	-		•	
168.	<i>Prebystis</i> sp. (Cercopithecidae) ^w	Lotong	Lotong	•M	•B	
169.	<i>Prionailurus</i> <i>planiceps</i> Vigors and Horsfield (Felidae) ^w	-	Kucing hutan		•	
170.	<i>Pristolepis fasciatus</i> Bleeker (Nandidae) ^w	Ikan patung	-		•	
171.	<i>Psettodes erumei</i> Bloch & Schneider (Psettodidae) ^w	-	Ikan lidah/ Sebelah		•	
172.	<i>Pteropus vampyrus</i> L. (Pteropodidae) ^w	Kelawar/ Keluang	Keluang	•T	•B	
173.	<i>Pycnonotus atriceps</i> Temminck (Pycnonotidae) ^w	Merbah kuning	-		•	
174.	<i>Pycnonotus brunneus</i> Blyth (Pycnonotidae) ^w	Burung kekong	-		•	
175.	<i>Pycnonotus goiavier</i> Scopoli (Pycnonotidae) ^w	Burung kelepok/ Merbah coklat/ Burung merbah	Burung merbah		•B	
176.	<i>Pycnonotus</i> <i>melanicterus</i> Gmelin (Pycnonotidae) ^w	Merbah jambul	-		•	
177.	<i>Python brongersmai</i> Stull (Boidae) ^w	Ular ipong/ Ulang tesang/ Ular nipong	-	•	•	
178.	<i>Python reticulatus</i> Schneider (Boidae) ^w	Ular sawa/ Ular	Ular sawa/ Ular/ Tijau	•B	•B	
179.	<i>Rana</i> sp. (Ranidae) ^w	-	Katak		•	
180.	<i>Rasbora einthovenii</i> Bleeker (Cyprinidae) ^w	Ikan daun/ Ikan seluan	-		•	
181.	<i>Rasbora</i> sp. (Cyprinidae) ^w	Ikan seluang/ Ikan sungai	-		•	
182.	<i>Rastrelliger</i> sp. (Scombridae) ^w	Ikan kembong	-		•	
183.	<i>Rattus sabanus</i> Thomas (Muridae) ^w	Tikus perah	-		•	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
184.	<i>Ratufa affinis</i> Raffles (Sciuridae) ^W	Tupai aleau/ Tupai bakah	-		•	
185.	<i>Ratufa bicolor</i> Sparman (Sciuridae) ^W	Tupai jinjang/ Tupai mengas/ Tupai	-	•	•	
186.	<i>Rhamdia quelen</i> Quoy & Gaimard (Heptapteridae) ^W	Ikan patin	-		•	
187.	<i>Rhinoplax vigil</i> Forster (Bucerotidae) ^W	Enggang/ Tekok	-		•	•
188.	<i>Rhinosciurus laticaudatus</i> Müller (Sciuridae) ^W	Tupai	-		•	
189.	<i>Rhizomys</i> sp. (Muridae) ^W	Tikus tekong	-		•	
190.	<i>Rhizomys sumatrensis</i> Raffles (Muridae) ^W	Tikus kadoi/ Dekan/ Tikus dekan/ Sangkeh	Kaneu		•B	
191.	<i>Rhynchophorus ferrugineus</i> Olivier (Curculionidae) ^W	Ulat kundi	Ulat di pokok kelapa		•B	
192.	<i>Robertsia</i> sp. (Pomatiopsidae) ^W	Siput sungai	-		•	
193.	<i>Scolopendra</i> sp. (Scolopendridae) ^W	-	Lipan	•M	•M	
194.	<i>Scolopendra subspinipes</i> Leach ssp. <i>dehaani</i> (Scolopendridae) ^W	Lipan api	-	•		
195.	<i>Scomberoides</i> sp. (Carangidae) ^W	-	Ikan talang		•	
196.	<i>Scomberomorus guttatus</i> Bloch & Schneider (Scombridae) ^W	-	Ikan tenggiri		•	
197.	<i>Scylla serrata</i> Forskål (Portunidae) ^W	-	Ketam nipah/ Ketam batu		•	
198.	<i>Scylla</i> sp. (Portunidae) ^W	-	Ketam gedeng	•	•	
199.	<i>Setipinna taty</i> Valenciennes (Engraulidae) ^W	-	Ikan bersia		•	
200.	<i>Sillago</i> sp. (Sillaginidae) ^W	-	Ikan bulus		•	
201.	<i>Stichopus horrens</i> Selenka (Holothuroidea) ^W	-	Lintah laut	•		

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
202.	<i>Streptopelia chinensis</i> Scopoli (Columbidae) ^W	Burung tekukur	Tekukur		●B	
203.	<i>Sundasciurus lowii</i> Thomas (Sciuridae) ^W	Tupai	Tupai		●B	
204.	<i>Sundasciurus tenuis</i> Horsfield (Sciuridae) ^W	Tupai chuchong/ Chuichoi/ Tupai	-		●	
205.	<i>Sus scrofa</i> L. (Suidae) ^W	Penyondol/ Babi/ Degan/ Khinzir/ Babi hutan	Ketu		●B	
206.	<i>Tamiops macclellandii</i> Horsfield (Sciuridae) ^W	Tupai kodes	Tupai belang		●B	
207.	<i>Taphozous melanopogon</i> Temminck (Emballonuridae) ^W	Kelawar	-		●	
208.	<i>Tapirus indicus</i> Desmarest (Tapiridae) ^W	Badak sipan	-		●	
209.	<i>Terapon jarbua</i> Forsskål (Terapontidae) ^W	-	Ikan kirong		●	
210.	<i>Terebralia sulcata</i> Born (Potamididae) ^W	-	Siput hisap/ Belitong		●	
211.	<i>Termes</i> sp. (Termitidae) ^W	Sarang anai-anai/ Tekoi		●		●
212.	<i>Thunnus alalunga</i> Bonnaterre (Scombridae) ^W	Ikan kembung hidup	-		●	
213.	<i>Todiramphus chloris</i> Boddaert (Halcyonidae) ^W	Burung cincang galah	-		●	
214.	<i>Tomistoma schlegelii</i> Müller (Gavialidae) ^W	Buaya	-	●		
215.	<i>Tor</i> sp. (Cyprinidae) ^W	Ikan kelah batu	-		●	
216.	<i>Tor tambroides</i> Bleeker (Cyprinidae) ^W	Ikan kelah	-		●	
217.	<i>Tragulus javanicus</i> Osbeck (Tragulidae) ^W	Kancil/ Pelanduk	Pelanduk/ Kancel		●B	
218.	<i>Tragulus napu</i> Cuvier (Tragulidae) ^W	Napuh/ Pelanduk/ Kancil	Napuh/ Panduk		●B	
219.	<i>Treron</i> sp. (Columbidae) ^W	Burung punai	Burung punai		●B	

Table 4.3: (continued)

No.	Zoological Name	Temuan Name	Mah Meri Name	M	F	S
220.	<i>Trigoniulus corallinus</i> Gervais (Trigoniulidae) ^W	Gonggok	-		●	
221.	<i>Tupaia glis</i> Diard (Tupaiidae) ^W	Tupai chong/ Tupai	-		●	
222.	<i>Tupaia minor</i> Günther (Tupaiidae) ^W	Tupai tanah	-		●	
223.	<i>Turnix suscitator</i> Gmelin (Turnicidae) ^W	Burung puyuh	Burung puyuh		●B	
224.	<i>Tyto alba</i> Scopoli (Tytonidae) ^W	Burung kuit	-		●	
225.	<i>Valanga nigricornis</i> Burm. (Acrididae) ^W	-	Belalang		●	
226.	<i>Varanus bengalensis</i> Daudin (Varanidae) ^W	Biawak	-		●	
227.	<i>Varanus salvator</i> Laurenti (Varanidae) ^W	Biawak/ Baset/ Merian/ Biawak	Bangkang/ Biawak	●M	●B	
228.	<i>Varanus</i> sp. (Varanidae) ^W	Biawak	Biawak	●T	●B	
229.	<i>Vespa</i> sp. (Vespidae) ^W	-	Tebuan/ Penyegat		●	
230.	<i>Viverra zibetha</i> Gray (Viverridae) ^W	Musang jebat	-		●	
231.	<i>Viverra zibetha</i> L. (Viverridae) ^W	Musang jebat	-		●	

- M Utilized for medicinal purpose
F Utilized for consumption purpose
S Utilized for spiritual purpose
^W Wild
^C Cultivated
- Was not utilized by the tribe in the study
● Utilized for the specific purposes
●B Utilized by both Temuan and Mah Meri for that specific purpose
●T Utilized by the Temuan only for that specific purpose
●M Utilized by the Mah Meri only for that specific purpose

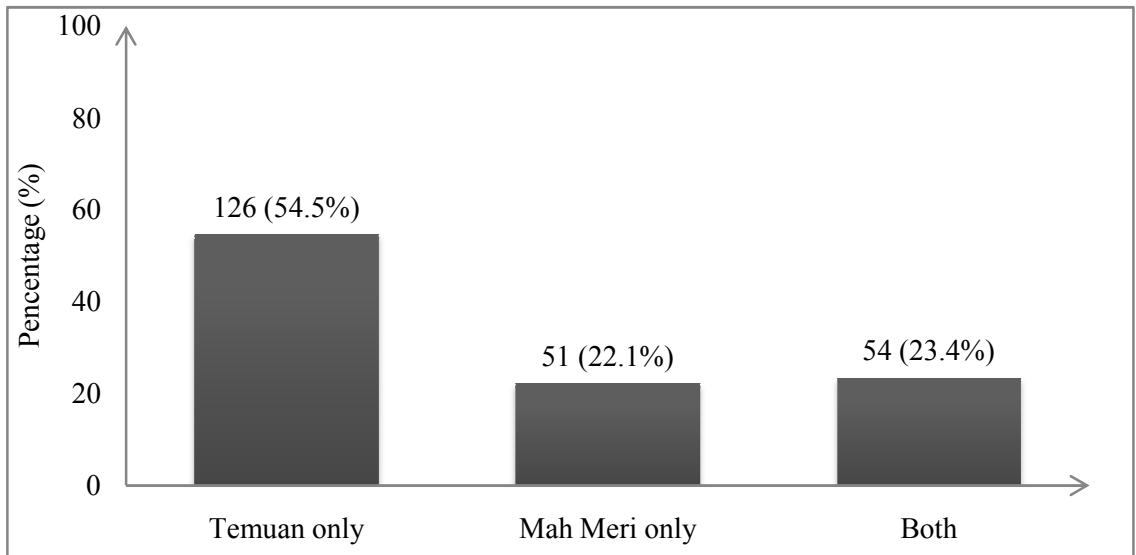


Figure 4.5: Numbers and percentages of animal species used by the Temuan and Mah Meri tribes

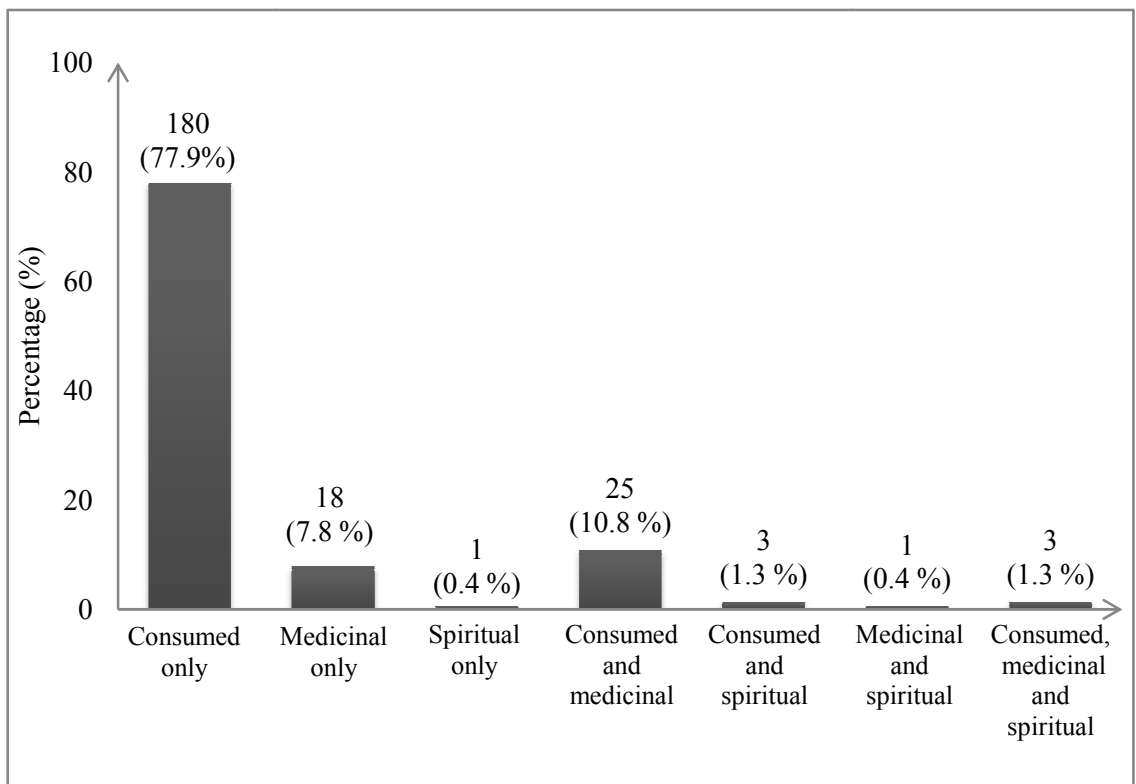


Figure 4.6: Numbers and percentages of each category of animal species utilization by the Orang Asli in Selangor

4.4 Natural Resources Utilized for Medicines

Before the Japanese occupation in Malaya (previous name for Malaysia), few records have been made on the account of the Orang Asli's health. Skeat and Blagden (1906b) for example had stated few illnesses associated with Orang Asli. They mentioned that small pox being as most prominent among them. Additionally, Skeat and Blagden (1906b) observed that most of the Orang Asli suffered from skin diseases. The worse was shown to be cutaneous malignant diseases, resembling skin ulceration. Other than that, fever and *Tinea imbricata* (ringworm) was not uncommon (Skeat & Blagden, 1906b).

After the Resettlement Program in Malaya during Japanese occupation, the health of Orang Asli deteriorated. This was due to the change of environment and forced adaptation to their new settlements. Various diseases have been contracted by the Orang Asli during that period. Decreased in Orang Asli numbers have been shown in Malaya (Williams-Hunt, 1952). In 1950, a survey has been performed and recorded by Polunin on the health and diseases of the Orang Asli at that time (Polunin, 1952; Williams-Hunt, 1952). The most common diseases include goitre, Elephantiasis, malaria, yaws, venereal diseases, *Tinea imbricata* or *kurap*, scabies, leprosy, vitamin deficiency, eye diseases, dysentery, decayed teeth and chest diseases (Williams-Hunt, 1952). Polunin (1952) mentioned that several main diseases have brought death to the Orang Asli during this time i.e. dysentery, fever (mostly in the form of malarial fever) and chest pain.

Although the natural resources were located far away from their new settlements, it did not hinder them to continue using it in treating various diseases even though modern drugs were available at hand (Williams-Hunt, 1952).

Not all of the plant species utilized by the Orang Asli in this study were used specifically in treating ailments and diseases only. Some of them were utilized as

bacterial disinfectant, feminine hygienic wash, anti-aging, stop children from breastfeeding (weaned children) and so on. Thus, rather than saying “ailments” or “diseases” only, “ailments or conditions” was used, instead.

It should be noted here that several ailments or conditions were grouped together in certain categories. This was done in order to estimate the total number of ailments or conditions involved or treated by the Orang Asli in this study. Such categories were postpartum, fever, tonic, cancer, skin fungal diseases and swelling.

Postpartum generally refers to as postnatal or after childbirth. It comprised of several conditions treated by the Orang Asli. This includes lochia, aches and swelling; excess fat, tightening of vaginal opening, contraction of uterus, tonic, general postpartum and utilized by midwife after childbirth. The word lochia however, was accompanied with “(*meriyan*)”. This was due to the specific term in English language could not be determined. However, it might be related with lochia or “discharge from the uterus after childbirth” (Pearsall, 2002). It was mentioned by the Orang Asli as “*untuk perempuan lepas bersalin untuk keringkan darah*”; “*keluarkan meriyan lepas bersalin*”; “*keringkan meriyan perempuan lepas bersalin*”; “*perempuan lepas bersalin sampai kering darahnya*”; or “*hentikan darah untuk perempuan lepas bersalin*”. This condition was treated by the Orang Asli using seven species of plants and one species of mushroom (Appendix 3 and 4). It was not to be confused with *meroyan* or *merian*, as these conditions were similar to postnatal depression syndrome. According to Kamus Dewan (Noresah *et al.*, 2005) *meroyan* or *merian* referred to “*gangguan emosi selepas bersalin akibat perubahan hormon dalam badan yang menyebabkan seseorang ibu murung*” or “emotional disturbance after childbirth induced by hormonal imbalance in mothers, causing depression”. Gimlette and Thomson (1971) meanwhile mention the term *meroyan* was used in Pahang to indicate “abnormal uterine discharges following childbirth”. This was probably more similar to the one described by the Orang Asli in

this study. Siti Hasmah (1987) on the other hand mentioned that the word “lochia” meant *darah nifas* or vaginal discharge after childbirth.

Other than postpartum, several conditions of fever were also grouped in fever category for the purpose mentioned earlier. These conditions include feverish, fever during night, fever in children, fever in the morning and high fever. In general, fever was defined as the increase of normal human body temperature i.e. 37 °C accompanied with shivering and headache (Waite, 2007).

Meanwhile, ringworm, *Tinea versicolor* and *Tinea imbricata* were grouped as skin fungal infection. *Tinea versicolor*, *panau* or white spots on the skin from fungal infection accompanied with occasional itchiness, was common in Malaysia. However, it must not to be confused with *T. imbricata* or *kurap* that was mentioned earlier on.

Another type of ailment grouped together for quantifying purpose was cancer or malignant growth of uncontrollable division of abnormal cells (Pearsall, 2002). This category consists of several types of cancers i.e. brain, skin, stomach and uterine cancer. Several conditions involving swelling were also recorded in this study, i.e. swelling with pustule, swelling caused from accidents and general swelling.

Uncertainty exists whether the condition mentioned by the informants as “stomach ache” was in reality “diarrhoea” instead. During the interview, the condition was simply given as *sakit perut*. No further details were given to describe this ailment or condition. The ailment or condition stated as “diarrhoea” in the study on the other hand was described as *berak-berak* or *cirit birit*.

4.4.1 Plants

Medicinal plant species recorded in this study covered a sum of 166 species from 72 families (see Appendix 3). The Mah Meri used 57 species of plants while the Temuan used 129 species of plants, medicinally. Overall, 108 ailments and conditions

were treated using plant species. The majority of the medicinal plant species used by the Orang Asli were obtained in the wild with 63.3 % (105 species). This was followed by cultivated with 33.1 % (55 species) and; both cultivated and wild with 3.6 % (six species) (Table 4.1).

Acanthus ilicifolius was used to treat the highest number of ailments and conditions with 12 ailments and conditions. It was followed by *Eurycoma longifolia* and *Homalomena sagittifolia* with 10 ailments and conditions, each. The third-highest utilized species were *Labisia pumila*, *Piper porphyrophyllum* and *Tinospora crispa* with nine ailments and conditions, each. *Eurycoma longifolia*, *H. sagittifolia*, *L. pumila* and *P. porphyrophyllum* were among the top three most commonly used species among the villages. *Eurycoma longifolia* for example was used in nine villages. *Homalomena sagittifolia* meanwhile was used in six villages. *Labisia pumila* and *P. porphyrophyllum* along with *Psidium guajava* were used in seven villages, each.

Known to some as “Malaysian Ginseng”, (Bhat & Karim, 2010; Khatun, Harun-Or-Rashid & Rahmatullah, 2011) *E. longifolia* is famed for its properties as tonic and to increase sexual prowess (Plate 4.1). Man anak Alam from Ulu Kuang however, disagreed with this claim. He said that it functioned more as a tonic to improve physical fitness rather than sexual prowess. Excessive consumption of the root decoction however could cause dizziness and; yellowish or reddish eyes according to Batin Alam Supah from Hulu Tamu and Man Anak Alam from Ulu Kuang. Zaharah Lisut from Tun Abdul Razak meanwhile mentioned that other than for medicine, the stem (*bahagian kayu*) of *E. longifolia* was also used in the making of blowpipe’s dart poison. It was prepared by mixing the stem with the sap of *Antiaris toxicaria* or *Ipoh* (see Appendix 3). Holmes (as cited in Burkill, 1966a) however mentioned that *E. apiculata* was used in the preparation of poison for arrow instead of *E. longifolia*. According to Batin Alam Supah’s personal experience, the effect of blowpipe poison made from *A. toxicaria* only

caused temporary paralysis and not fatal. He added that *E. longifolia* was often confused with another species called *Pasak bumi* (most probably *E. apiculata*). These two species was differentiated based on the differences in the colour of the stem, where *Eurycoma apiculata*'s stem was stated as lighter (whiter) than *E. longifolia*.



Plate 4.1:
Eurycoma longifolia Jack (Simaroubaceae)

According to Man anak Alam from Ulu Kuang, among the Orang Asli the species known as *Tongkat ali* was not *E. longifolia* but *Polyalthia bullata*, instead. It was better known as *Tongkat ali hitam* (Plate 4.2). This species is well known among the Orang Asli in Malaysia. It was used not only to increase sexual prowess among men but also for asthma, diabetes, waist pain, hypertension, constipation, weak body and overall health in Bukit Lagong and Ulu Kuang (Appendix 3). In Bukit Lagong, its root and underground stem were decocted with the root of *E. apiculata*. Meanwhile in Ulu Kuang, it was decocted alone. Both were taken orally although not in large quantities (in Ulu Kuang) for unknown reason (Appendix 3). Similarly, it was used by the Temuan in Negeri Sembilan to increase sexual prowess by taking its root decoction orally (Ong, Chua & Pozi, 2011a). Other than that, the Malay drunk its root decoction to treat kidney infection and as a general tonic. The finely pounded root, leaf and flower meanwhile

was taken to treat hypertension and diabetes (Ong & Nordiana, 1999; Ong & Norzalina, 1999). Burkill (1966a) mentioned that *P. bullata* might also be used in treating liver disease and tonic. Kamarudin and Jackson (2006) recorded that its root decoction was used in treating back pain and to improve the health of a recovered child.



Plate 4.2:
Polyalthia bullata King (Annonaceae)

Acanthus ilicifolius (Plate 4.3) was mainly used by the Orang Asli from the Mah Meri tribe. This was due to the natural habitat of this species in mangrove forest and the Mah Meri settlement (near the coastal and mangrove areas). It was used in treating various ailments and conditions, especially several types of cancers (Appendix 3). Batin Nengkak anak Mat from Sungai Kurau mentioned that the source of this species has been very scarce. According to them, the “outside” people (especially the Chinese medicine man or *senseh*) would come into their vicinity and ask for medicinal species to be sold to them. This has forced some of the Orang Asli to hide the species from prying eyes. The utilization of *A. ilicifolius* for cancer treatment has been determined in India by Babu, Shylesh and Padikkala (2002), in China by Duke and Ayensu; and Jongsuwat (as cited in Graham, Quinn, Fabricant & Farnsworth, 2000) and in Thailand by Duke and Ayensu (as cited in Graham *et al.*, 2000). However, instead of using its fruit (like

the Mah Meri in this study), they utilized its stem (in China and Thailand), root (in China) and its leaf (in India). Unlike *E. longifolia*, this species still lacks studies on its chemical constituents and properties.



Plate 4.3:
Acanthus ilicifolius L. (Acanthaceae)

Homalomena sagittifolia (Plate 4.4) meanwhile was widely used among the Temuan in this study, mainly to aid the recuperation of new mothers during postpartum confinement (Appendix 3). This purpose was mentioned in all six villages it was used. This species was claimed to be able to heal the body of a newborn mother. By applying the parched leaf, it was probably able to provide enough warmth to increase the blood flow or lochia discharge out of the body. The Temuan in Ayer Hitam, Selangor meanwhile used its root and leaf in treating fever, while its root alone for distended stomach (Faridah Hanum & Nurulhuda, 1999).

Additionally, the Temuan of Songkok Village used *H. sagittifolia* to treat a type of fever called *demam kura-kura*. According to Juriah Bachik and Malek Jaafar, this fever is accompanied with bloated stomach. The treatment for this fever was unique and

specific in its own way. In treating *demam kura-kura*, the leaf of *H. sagittifolia* was taken with odd numbers everyday i.e. five leaves on the first day, three on second day and one leaf on the third day. These leaves were parched over fire and tied to the stomach. In Gimlett and Thomson (1971), they mentioned that this type of fever was also known as malaria or ague. According to them, the effect of repeated chills and shivering cause the spleen to enlarge that was similar to the shape of a tortoise shell. However, malaria or even ague was not known to come with bloated stomach. Thus the term malaria or ague used by Gimlette and Thomson (1971) to represent *demam kura-kura* is questionable.



Plate 4.4:
Homalomena sagittifolia Jungh. ex Schott (Araceae)

Another type of fever that could not be fully conveyed using the modern medicinal term was *demam kepialu*. It was treated using *Grewia laurifolia* and *Vernonia javanica* in Broga Village. Specifically, the stem and leaf decoction of *G. laurifolia* was drunk or its mashed leaf was patched on the head. Meanwhile for *V. javanica*, its leaf infusion was drunk (Appendix 3). According to Gimlette and Thomson (1971), this fever referred to a condition where the fever continued and lasted for more than three days. They added that different types of *kepialu* involved different stages of malarial

fever. In *Kamus Dewan*, *demam kepialu* was referred to two conditions. One is a type of ailment caused from microorganism infection originating from unclean water and food. The other is a fever associated with headache (Noresah *et al.*, 2005). According to Batin Asu Dollah from Tun Abdul Razak, it took a while for a patient to recover from *demam kepialu* (“...lama macam demam kepialu”) – in reference to *demam kerabok*’s recovery time (which will be discussed in Chapter 4.5.2). This is similar to the definition given by Gimlette and Thomson (1971). The closest and most similar disease condition with *demam kepialu* is probably “typhoid fever”. Both of these terms are included in Appendix 3.

Labisia pumila (Plate 4.5) meanwhile is one of the most commercialized plant species in Malaysia. Its products ranged from herbal tea to mixed herb medicines. In this study however, it was mainly used as a tonic for women and aiding postpartum recovery. Mainly, the Orang Asli took its underground stem and root decoction, orally (Appendix 3). However, according to the wife of Johari Buyong from Kolam Air, *Didymocarpus platypus* (Plate 4.6) was used more often for postpartum recovery than *L. pumila*.



Plate 4.5:
Labisia pumila Fer.-Vill.
(Myrsinaceae)



Plate 4.6:
Didymocarpus platypus C.B. Clarke
(Gesneriaceae)

All the species mentioned above (excluding *A. ilicifolius* and *D. platypus*) were sold to the middlemen in Kolam Air. In Kuala Kerling Orang Asli Village (Kuala Kubu Bharu) for example, the root of *E. longifolia* was sold at RM5.00/kg (Fatin Nuraini, 2009; Nur Awanis, 2009). Er, Zalina and Pereira (2010) meanwhile reported that *E. longifolia* was sold at a price of RM 6.00/root. Apparently, both *E. longifolia* and *L. pumila* were categorized under endangered species according to International Union for Conservation of Nature and Natural Resources. These species were rare in Kolam Air (Fatin Nuraini, 2009). In Tun Abdul Razak, these species were not sold. This was due to the low demand and lack of knowledge regarding the plants' utilization and abilities among the outsiders (Norfaizah, 2009).

Among the ailments and conditions treated using plant species, hypertension was the most commonly treated with 27 species of medicinal plants. Diabetes meanwhile was placed second with 24 species (14.5 %) followed by fever with 20 species (12.0 %). Hypertension or high blood pressure is a relatively prevalent disease even among the Orang Asli. Shreema (2007) found that hypertension shows a higher prevalence among the Orang Asli in urbanized locations i.e. in Selangor rather than in Pahang or Kelantan. Hypertension was treated mainly by using the root part from 18 species of plants. The formulations were prepared in majority via decoction. All of these formulations were taken orally either drunk or eaten. Among the species used to treat hypertension, two species were utilized using more than one part of the plants. The first was *Centella asiatica* involving its stem, leaf and root. All these parts were decocted and drunk in Kepau Laut. The second species was *Melastoma sanguineum* (Plate 4.7) involving its flower and root. These parts were decocted separately and drunk in Broga Village (Appendix 3).

Diabetes is marked with the increase of blood glucose level or hyperglycaemia (Barzilai & Shamoan, 1997). This disease was mainly treated using the root part with

13 species of plants. All of the formulations were taken orally, mostly in the form of decoction.

Archidendron bubalinum was one of the species used in treating diabetes. However, a difference of information was mentioned in two Temuan villages regarding the utilization of this species. In Bukit Lagong, its unripe seed was eaten alone or probably was eaten as salad. While in Tun Abdul Razak, its ripe seed was eaten with fish. Although no additional information was given in Bukit Lagong, in Tun Abdul Razak, Kelas Kelab mentioned that the seed should not to be consumed alone. According to her, the seed of *A. bubalinum* must be consumed with other resource e.g. fish, and in small quantity. Failure to do so could delay urination to a stop and cause fatality. Burkill (1966a) also mentioned that the seed of *A. bubalinum* could pose a dangerous effect on kidney. However, he did not specify the condition related to this effect. The condition that might cause fatality and effect on kidney, however, may be related with djenkolic acid. This compound is found in *A. jiringa* and in urine after consuming, in the form of sharp crystals (du Vigneaud & Patterson, 1936).



Plate 4.7:
Melastoma sanguineum Sims. (Melastomataceae)

Among the plant parts utilized in preparing the formulations, leaf was the most commonly utilized part with 68 species of plants. It was followed closely by root with 60 species and stem with 20 species. The leaf was commonly prepared via decoction from 30 species. Most of them were drunk i.e. 26 species. This was followed by raw and mashed with 11 and 10 species, respectively. The Orang Asli in this study used leaf in treating 65 ailments and conditions. The most commonly treated ailment and condition was fever with nine species. It was followed by wound and postpartum with eight species. Seven species of plants meanwhile used leaf to treat hypertension.

Wound was generally treated by patching or placing the mashed, pounded or crushed leaf onto the affected area. This step was usually taken to stop the bleeding and closing the wound. Such were the use of *A. ilicifolius*, *Amorphophallus* sp., *Chromolaena odorata*, *Leea indica*, *Mikania cordata*, *M. micrantha*, *P. porphyrophyllum* and *P. guajava* (Appendix 3). In Hulu Tamu, Batin Alam Supah mentioned that *Arenga westerhoutii* could also be used to close wound opening. The fibre (from under the leaf sheath) was used by placing it on the wound along with incantation. This fibre could also prevent pain upon the wound contact with water. However, the patient needs to refrain from eating any chillies. Otherwise, this could cause pain to the wounded area. According to Batin Alam Supah, any contact with water after consuming chillies could cause the wound to swell and pained (the term *bisa* was used by Batin Alam Supah). Thus, as a counter measure, the patient was not allowed to have any contact with water including bath for one whole day. The fibre was searched for when the Orang Asli went into the forest. It was also used in the structure of blowpipe, as windage.

Tuber was utilized less than root among the plant parts recorded. Nevertheless, its utilization should be noted as well. *Smilax mysotiflora*'s tuber for example was popularly used in increasing sexual prowess of men. Since it was collected in the wild

and not cultivated, unlike *E. longifolia*, the search for it has become even more. According to Tok Jenang from Broga Village, the size of its tubers depends on the moon's phases. The tuber was said to grow bigger during full moon (Plate 4.8). In Songkok Village, the tuber of *S. myosotiflora* was sold at RM 25.00 for ten to fifteen small tubers, when it was made available to them. Other than used for sexual prowess, the Semai used this species (by eating it raw with betel leaf) to darken the blood. They believe it as a sign of increased strength (Adi, Hood & Rashid, 2006).



Plate 4.8:
Tubers of *Smilax myosotiflora* A. DC. (Smilacaceae)

Decoction of plant parts was the most common preparation method of formulation. This method of preparation involved 39.2 % of the total formulations. It was followed by raw – the plant part(s) was taken or utilized directly – with 17.5 % and pounded with 7.1 %.

Three of the most common administrations using medicinal plant species were drunk (43.3 %), applied (16.8 %) and eaten (15.4 %). Meanwhile, the most common method of application was oral (59.4 %) followed by external (37.8 %) and; both oral and external (1.7 %). Oral medications were usually applied to treat internal ailments or

conditions. This ranged from fever and diarrhoea to antidotes. Whereas externally applied formulations generally involved ailments or conditions associated with skin or as cleanser.

Six of the plant species used by the Orang Asli involved the recitation of incantations. These incantations were recited before, during preparation or upon application. The rhizome of *Zingiber montanum* for example was used in Ulu Kuang for shingles, oedema and gout. The rhizome was grated after certain incantation was recited. The root of *Hibiscus rosa-sinensis* var. *alba* meanwhile was decocted along with incantations. This decoction was drunk for bloated stomach in Hulu Tamu. According to Batin Alam Supah from Hulu Tamu, the decoction will turn to blue colour after decocting as the effect of the incantation. Recited incantations before applying the formulations meanwhile involved *Cocos nucifera* and *Z. spectabile* in treating shingles in Ulu Kuang and as an antidote in Tun Abdul Razak, respectively. Meanwhile, in Gurney Village the incantations were recited during the application of formulations for *Elattariopsis curtisii* and *L. pumila*. The leaf of *E. curtisii* was rubbed on the affected areas along with incantation to treat cancer. The incantation involving *L. pumila* on the other hand was recited while drinking its root decoction for lochia (*meriyan*) (Appendix 3). The incantations mentioned for these species were recited to increase the efficacy of the prepared formulations. However, these specific incantations were not disclosed.

Low similarity of medicinal plant species were shown between the Mah Meri and Temuan tribes. The calculations using Jaccard Index (JI) resulted 0.12. This number stemmed from the similar plant species used by both tribes shown in Table 4.4. Twenty species of plants, their utilization and specific preparations for ailments and conditions were listed here. Although these species were used by both tribes, not all of them were used in treating the same ailments and conditions, let alone preparations and applications.

Table 4.4: Comparison of medicinal plant species used by both Mah Meri and Temuan tribes

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
1.	<i>Alpinia galanga</i> (L.) Willd. (Zingiberaceae)	Rhizome	<i>Tinea versicolor</i> Shingles	Sliced and rubbed on the affected area -	UK -	The affected area is scratched. The rhizome is pounded and applied on the affected area	SK
2.	<i>Angiopteris evecta</i> (Forst.) Hoffm. (Marattiaceae)	Rhizome	Cancer e.g. stomach, lung and liver cancer Ringworm and <i>Tinea versicolor</i>	Cut into small parts and boiled; or the rhizome is cut, dried and boiled with 1 glass of water until only about a half glass is left. The decoction is drunk Dried, pounded and mixed with coconut oil. Applied on the affected area	B UK	- -	- -
3.	<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae)	Fiddle head Root Seed Pod	Boils Diabetes Hypertension and diabetes Diabetes Cleanse blood	- Cut and boiled with 2 cups of water until the water measured about one cup. The decoction is drunk Decocted and drunk Eaten raw as salad -	- KA UK UK -	Pounded and applied on the boil - - Eaten raw	SJ - - SK

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
4.	<i>Carica papaya</i> L. (Caricaceae)	Fruit (ripe)	Poison antidote	Eaten raw	SJG	-	-
		Root	Poison antidote	Decocted and drunk	SJG	-	-
		Shoot	Aging	-	-	-	SJ
		Leaf	Hypertension	-	-	Boiled and eaten as salad Decocted and drunk	SR
5.	<i>Chromolaena odorata</i> (L.) King & H. E. Robins (Asteraceae)	Leaf	Wound Worsen cough and cold	Mashed and applied on the affected area -	B -	- -	- SB
6.	<i>Cocos nucifera</i> L. (Arecaceae)	Young fruit juice	Chicken pox	-	-	Drunk, used for bathing and applied on the spots of chicken pox Drunk raw Drunk raw	SK SB KP
			High fever Shingles	- -	- -	Drunk after specific incantation	UK
		Young fruit juice and meat	Chicken pox and high fever	-	-	The juice is drunk raw and the meat is eaten raw	SJ

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
7.	<i>Curcuma longa</i> L. (Zingiberaceae)	Rhizome	Barrenness	Sliced, infused with water and drunk	B	-	-
				Pounded, cooked with oil and mixed with charred <i>Artocarpus heterophyllus</i> leaf. It is applied onto the affected area	BL	-	-
				Internal wound	-	Pounded or boiled and the extract or decoction is drunk	KP
8.	<i>Cyrtandromoea grandis</i> Ridl. (Scrophulariaceae)	Leaf	High fever	Pounded with water-soaked rice grains and applied to head and body	SJG	-	-
				Pounded with water soaked rice grains and applied to head and body	SJG	Mashed and the extracts applied on the forehead	SK
				Fever	-	Squeezed and the extract dotted on the forehead	SB
9.	<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Root	Blood thinner Cough Diabetes Hypertension Massage oil Medicine for men	Decocted and drunk	HT	-	-
				Decocted and drunk	BL	-	-
				Decocted and drunk	G, UK	-	-
				Decocted and drunk	G, TAR, UK	-	-
				Sliced and infused in oil	BL	-	-
Decocted and drunk	B, BL, G,	-	-				

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
9.	<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Root	Lassitude	Decocted and drunk	TAR	-	-
			Muscle pain	Decocted and drunk	UK	-	-
			Overall health	Decocted with other ingredients and drunk	BL	-	-
			Tonic for men	Decocted and drunk	HT	Decocted and drunk	SB, SJ
			Waist pain	Decocted and drunk	KS	-	-
		Leaf and root	Overall health	Decocted and drunk	UK	-	-
		Leaf	Tonic for men and blood thinner	Decocted and drunk	HT	-	-
		Shoot	Expectoration	-	-	Mixed with white hibiscus leaf, pounded and mixed with a little bit of water. The mixture is patched to the head	SK
10.	<i>Hibiscus rosa-sinensis</i> L. (Malvaceae)	Leaf	Induce hair growth and thicken hair	Mashed and applied on head	B	-	-
		Flower	High fever	Infused in hot water and applied on body	SJG	-	-
			Sore eyes	Infused in water and instilled into the affected eye	TAR	-	-

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration				
				Temuan	Village(s)	Mah Meri	Village(s)	
11.	<i>Imperata cylindrica</i> (L.) Beauv (Poaceae)	Root and runner	Hypertension	Decocted with <i>Areca catechu</i> root, <i>Garcinia mangostana</i> shoot and bark of <i>Pulas</i> tree. The decoction is drunk	BL	Decocted and drunk	SK	
				Diabetes	Decocted with <i>Labisia pumila</i> leaf and root. The decoction is drunk	HT	Decocted and drunk	SK
				High fever and overall health	-	-	Decocted with <i>Melastoma sanguineum</i> root. The decoction is drunk	SJ
12.	<i>Labisia pumila</i> (Blume) Fer.-Vill. (Myrsinaceae)	Root and underground stem	Lochia (<i>meriyan</i>) Expanded vaginal opening (postpartum) Tonic (postpartum) Hypertension Tonic (women) Postpartum	Decocted and drunk	KS	-	-	
				Decocted and drunk for three days with specific incantation	G	-	-	
				Decocted and drunk	HT	-	-	
				-	-	Decocted and drunk	SB	
				Decocted and drunk	TAR	-	-	
Decocted and drunk	B, TAR	-	-					
Decocted and used for bathing	UK	-	-					
Decocted and drunk	B	-	-					

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
12.	<i>Labisia pumila</i> (Blume) Fer. - Vill. (Myrsinaceae)	Root and underground stem	Postpartum	Decocted with 3 to 4 <i>Syzygium aromaticum</i> dried flower bud (clove), 3 cloves of <i>Allium sativum</i> (garlic), hill spice (<i>Cinnamomum</i> sp.), a bit of black pepper, 2 to 3 slices of <i>Zingiber officinale</i> rhizome (ginger) and <i>Pokok lawang</i> . The decoction is drunk from the third day of postpartum until the postpartum confinement period ended; or the root is decocted with <i>Akar pengecut</i> and the decoction is drunk	KS	-	-
				Decocted and drunk	HT	-	-
13.	<i>Leea indica</i> Merr. (Vitaceae)	Leaf	Fracture	Decocted and drunk	UK	-	-
				Decocted and drunk	UK	-	-
				Decocted separately. The leaf decoction is used for bathing while the root decoction is drunk	UK	-	-
				Pounded and patched on the fracture	B	-	-
			Wound	Pounded and patched on the wound	UK	-	-

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
13.	<i>Leea indica</i> Merr. (Vitaceae)	Shoot	Fracture	Pounded and patched on the fracture	B	-	-
			Wound	Cut into smaller pieces, patched on the wound and dressed Parched, pounded and patched on the wound for 3 days before removing it	UK	-	-
		Bark	Fractured (leg)	-	-	Pounded and patched to the affected leg	SK
		Root	Hypertension Jaundice	-	-	Decocted and drunk	SK
14.	<i>Melastoma sanguineum</i> Sims. (Melastomataceae)	Shoots	Cough	-	-	Decocted and drunk	SR
		Flower	Hypertension and lassitude	-	-	Eaten raw as salad	SK
		Flower and root	Hypertension	-	-	Picked early in the morning and infused in hot water. The water is drunk	SK
		Flower and root	Diseases antidote	Decocted separately and the decoctions are drunk	B	-	-
				Decocted and drunk	HT	-	-

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
15.	<i>Orthosiphon aristatus</i> (Blume) Miq. (Lamiaceae)	Leaf	Diabetes	Decocted and drunk	B	Decocted and drunk Infused in water (5 to 6 leaves per glass of water) and drunk	SB
			Hypertension	Decocted and drunk	G	Decocted and drunk Infused in water (5 to 6 leaves per glass of water) and drunk	SJ SB SJ
		Seed	Diabetes	Eaten raw as salad	TAR	-	-
		Bean pod and seed	Diabetes	Eaten raw	UK	-	-
16.	<i>Parkia speciosa</i> Hassk. (Fabaceae)	Root	Diabetes	Decocted and drunk	B, SJG, UK	-	-
			Hypertension	Decocted and drunk	UK	-	-
		Pod	Cleanse blood	-	Eaten raw	-	SK
17.	<i>Piper betel</i> L. (Piperaceae)	Leaf	High fever	Decocted with <i>Areca catechu</i> nut. The decoction is drunk	B	-	-
			Feminine hygiene cleanser	-	-	Decocted and the decoction is used as hygienic cleanser	SJ
			Myopia	-	-	The leaf (with its entire vein met at apex – <i>semua hujung uratnya bertemu</i>) is pounded and put in a thin cloth and squeezed. The extract is dotted into the eyes	SJ

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
17.	<i>Piper betel</i> L. (Piperaceae)	Leaf	Blackout	-	-	Ground with black pepper and onion. The concentration is swept all over the patient's face	SJ
		Shoot	Nosebleed	Mashed and inserted in nostril for 10 minutes	SJG	-	-
18.	<i>Poikilospermum suaveolens</i> (Blume) Merr. (Cercopiaceae)	Water inside the root	Asthma	Drunk raw	SJG	-	-
			Cough	-	-	Drunk raw	SB
19.	<i>Psidium guajava</i> L. (Myrtaceae)	Bark	Diarrhoea	Decocted with <i>Nephelium lappaceum</i> bark and the decoction is drunk three times a day	B	-	-
		Leaf	Diarrhoea	Decocted and drunk	SJG, TAR	-	-
		Shoot	Wound and scabies	-	-	Decocted and the decoction is used for bathing	SR
			Diarrhoea	Decocted and drunk	BL	-	-
			Stomach ache	-	-	Decocted and drunk Decocted with <i>Eurycoma longifolia</i> root and <i>akar leban</i> . The decoction is drunk	KP SK

Table 4.4: (continued)

No.	Botanical Name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
20.	<i>Senna alata</i> (L.) Roxb. (Fabaceae)	Leaf	Scabies <i>Tinea versicolor</i> and skin fungal infection <i>Tinea versicolor</i> Shingles	Pounded and applied on the affected area	UK	Pounded with <i>Cucurma longa</i> rhizome and salt; and applied to the affected area (for external use only)	KP
				-	-	Mashed and applied on the affected area	SB
				-	-	Ground and mixed with slaked lime; and applied on the infected area	SJ
				-	-	Mixed and pounded with <i>Alpinia galanga</i> rhizome and slaked lime. The paste is applied on the affected area	SK

(B: Broga Orang Asli Village; BL: Bukit Lagong Orang Asli Village; G: Gurney Orang Asli Village; HT: Hulu Tamu Orang Asli Village; KA: Kolam Air Orang Asli Village; KP: Kepau Laut Orang Asli Village; KS: Songkok Orang Asli Village; SB: Songkai Bumbun Orang Asli Village; SJ: Sungai Judah Orang Asli Village; SJG: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; SR: Sungai Rambai Orang Asli Village; TAR: Tun Abdul Razak Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

The species in Table 4.4 that were used in treating similar ailments and conditions were grouped in Table 4.5. Nine ailments and conditions were treated using the same species of plants by the Mah Meri and Temuan tribes. This involved nine species of plants namely *Alpinia galanga*, *Cyrtandromoea grandis*, *E. longifolia*, *Imperata cylindrica*, *L. pumila*, *L. indica*, *M. sanguineum*, *Orthosiphon aristatus* and *Senna alata*. Three species in Table 4.5 were utilized in treating the most number of ailments and conditions i.e. two ailments and conditions, each. These species were *C. grandis*, *I. cylindrica* and *O. aristatus*.

Table 4.5: Ailments or conditions treated by both tribes using the same species of plants

Ailment or condition	Plant species used in treating the ailment or condition
Diabetes	<i>Imperata cylindrica</i> and <i>Orthosiphon aristatus</i>
Fever	<i>Cyrtandromoea grandis</i>
Fracture	<i>Leea indica</i>
Headache	<i>Cyrtandromoea grandis</i>
Hypertension	<i>Imperata cylindrica</i> , <i>Melastoma sanguineum</i> and <i>Orthosiphon aristatus</i>
Postpartum	<i>Labisia pumila</i>
Scabies	<i>Senna alata</i>
Skin fungal infection	<i>Alpinia galanga</i>
Tonic	<i>Eurycoma longifolia</i>

Cyrtandromoea grandis was used in three Orang Asli villages. This species was used topically by both tribes as febrifuge and for headache using its leaf (Tables 4.4 and Table 4.5). However, different methods of preparations were applied by both tribes for these ailments and conditions. The Temuan in Sungai Jang for instance pounded the leaf of *C. grandis* with water-soaked rice (*beras yang direndam bersama air*). The Mah Meri in Sungai Kurau and Sungai Bumbun meanwhile used its leaf extract that was obtained by mashing or squeezing the leaf.

Imperata cylindrica was used by both tribes to treat hypertension and diabetes (Table 4.4 and Table 4.5). The decoction of its root and runner was decocted and drunk by both tribes to treat these ailments and conditions. Unlike the Mah Meri, the Temuan decocted the root and runner of *I. cylindrica* with other species of plants (Table 4.4).

The third species, *O. aristatus* was also used by both tribes to treat diabetes and hypertension. The leaf decoction of this species was drunk by both tribes for both ailments and conditions. In addition, the Mah Meri also took the leaf infusion of this species orally, to treat both diabetes and hypertension i.e. in Sungai Judah (Table 4.4).

The total numbers of medicinal plant species recorded in each village are shown in Table 4.6. The highest number of medicinal plant species was mentioned in Tun Abdul Razak with 49 species. This were followed by Broga Village and Sungai Jang with 41 and 31 species of plants, respectively. The lowest was mentioned in Sungai Rambai with five species, followed by Songkok Village with eight species.

Similar numbers of medicinal plant species used between the villages in this study meanwhile are presented in Table 4.7. The numbers of similar plant species between the villages range from zero to 17 species. The highest number of similarities was shown between Broga Village – Ulu Kuang. This was followed by Tun Abdul Razak – Ulu Kuang with 10 species and Sungai Jang – Ulu Kuang with nine species. Several villages meanwhile showed no similar species between them, i.e. Kolam Air with Sungai Bumbun, Sungai Judah or Sungai Rambai; Kepau Laut with Gurney Village, Hulu Tamu, Kolam Air or Songkok Village; Songkok Village with Sungai Kurau or Sungai Rambai; and Sungai Rambai with Gurney Village or Ulu Kuang (Table 4.7). From the data in Tables 4.6 and 4.7, the similarity coefficient between the villages was calculated using JI. The results are shown in Figure 4.7.

The highest similarity coefficient in Figure 4.7 was shown between Sungai Bumbun – Sungai Judah with 0.25. This was closely followed by Broga Village – Ulu

Kuang and Hulu Tamu – Songkok Village with 0.24. The third highest similarity coefficient was shown between Sungai Jang – Tun Abdul Razak with 0.22.

Table 4.6: Numbers of medicinal plant species mentioned in each Orang Asli village

Villages	Total numbers of medicinal plant species mentioned
Broga Village (B)	41
Bukit Lagong (BL)	22
Gurney Village (G)	18
Hulu Tamu (HT)	18
Kolam Air (KA)	15
Kepau Laut (KP)	18
Songkok Village (KS)	8
Sungai Bumbun (SB)	17
Sungai Judah (SJ)	18
Sungai Jang (SJG)	31
Sungai Kurau (SK)	26
Sungai Rambai (SR)	5
Tun Abdul Razak (TAR)	25
Ulu Kuang (UK)	49

Table 4.7: Matrix of similar numbers of medicinal plant species used between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	5	-												
G	7	4	-											
HT	6	3	5	-										
KA	4	2	2	2	-									
KP	2	2	0	0	0	-								
KS	4	3	4	5	1	0	-							
SB	4	1	3	2	0	4	2	-						
SJ	4	2	2	2	0	6	1	7	-					
SJG	8	6	5	5	7	1	2	2	2	-				
SK	5	2	1	2	1	5	0	7	7	4	-			
SR	2	1	0	1	0	2	0	1	2	2	3	-		
TAR	9	5	6	8	4	1	5	2	1	10	3	1	-	
UK	17	7	8	5	6	2	4	4	4	9	6	0	6	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.09	1.00												
G	0.13	0.11	1.00											
HT	0.11	0.08	0.16	1.00										
KA	0.08	0.06	0.06	0.06	1.00									
KP	0.04	0.05	0.00	0.00	0.00	1.00								
KS	0.09	0.11	0.18	0.24	0.05	0.00	1.00							
SB	0.07	0.03	0.09	0.06	0.00	0.13	0.09	1.00						
SJ	0.07	0.05	0.06	0.06	0.00	0.20	0.04	0.25	1.00					
SJG	0.13	0.13	0.11	0.11	0.18	0.02	0.05	0.04	0.04	1.00				
SK	0.08	0.04	0.02	0.05	0.03	0.13	0.00	0.19	0.19	0.08	1.00			
SR	0.05	0.04	0.00	0.05	0.00	0.10	0.00	0.05	0.10	0.06	0.11	1.00		
TAR	0.16	0.12	0.16	0.23	0.11	0.02	0.18	0.05	0.02	0.22	0.06	0.03	1.00	
UK	0.23	0.11	0.14	0.08	0.10	0.03	0.08	0.06	0.06	0.13	0.09	0.00	0.09	1.00

Figure 4.7: Matrix of similarity coefficient of medicinal plant species between the villages in this study using Jaccard Index (JI) (data from Tables 4.6 and 4.7) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Some of the villages show higher similarity (numbers and coefficient) with the villages located in different districts. Broga Village and Ulu Kuang for instance, shows the highest number of similar medicinal plant species and second highest similarity coefficient in Table 4.7 and Figure 4.7, respectively. Broga Village is located in Hulu Langat district while Ulu Kuang in Gombak district. In comparison to this, Bukit Lagong and Ulu Kuang are both located in Gombak district and separated by the Bukit Lagong Forest Reserve. However, unlike Broga Village and Ulu Kuang, they used only seven similar numbers of species (Table 4.7). The similarity coefficient between Bukit Lagong – Ulu Kuang meanwhile results to 0.09 (Figure 4.7).

Another example could be seen from Kolam Air, Sungai Jang and Tun Abdul Razak. These villages shared more than similar geographical locations, vegetations and district. As mentioned earlier in Chapters 3.2.7 and 3.2.9, both Kolam Air and Sungai Jang villagers originated from Tun Abdul Razak. Their similar number of species and similarity coefficient in Table 4.6 and Figure 4.7, however, are low. Only three medicinal plant species were similarly used between these three villages. These species are *Cheilocostus speciosus* for fever, *H. sagittifolia* for postpartum and *Scorodocarpus borneensis* for intestinal worm (Appendix 3).

Between the Mah Meri villages meanwhile, low similarity and similarity coefficient of medicinal plant species could be seen. The similar number of species ranged from one to seven species, only (Table 4.7). The similarity coefficient between Mah Meri villages meanwhile ranged from 0.05 to 0.25 (Figure 4.7). From the total number of medicinal plant species used by both tribes, 109 species were used solely by the Temuan. Thirty-seven species meanwhile was used only by the Mah Meri. These numbers were obtained by disregarding the 20 similar species in Table 4.4 from the total numbers of medicinal plant species used by each tribe (shown earlier in Chapter 4.4.1). Some of the Mah Meri informants mentioned that the Temuan possessed more

knowledge on the medicinal plants. Additionally, some of the Mah Meri informants called the Temuan as *Orang bukit* or “hill people”. This referred to the areas that the Temuan usually reside. Batin Asu Dollah from Tun Abdul Razak mentioned that his people (the Temuan) possessed a wide knowledge of natural resources. He also likes to test the capability of natural resources as medicine himself in order to know the potentials. The abundance of natural resources possessed by the Temuan tribe in comparison to the Mah Meri tribe could also influence the various traditional medicinal knowledge that they held.

4.4.1.1 The most common chronic diseases in Malaysia treated by the Orang Asli in Selangor using plant species

Chronic diseases were diseases that cause long term illness with slow progression to the patient (World Health Organisation [WHO], 2012a). In Malaysia, a survey on the prevalent chronic diseases is known as National Health and Morbidity Surveys (NHMS). This survey was done every ten years. Starting from 2011 however, it was implemented by the Health Minister, Datuk Seri Liow Tiong Lai to be done every 4 years (Amal, Paramesarvathy, Tee, Gurpreet & Karuthan, 2011; Singh, 2011). The third and latest was conducted in 2006. Seventeen most prevalent chronic diseases in Malaysia were listed in NHMS III (retrieved from Amal *et al.*, 2011). Six of these diseases were treated by the Orang Asli in this study using plant species shown in Table 4.8. These diseases were sorted in descending order according to the number of plant species used in treating them.

Forty-three species of plants are listed in Table 4.8. Among them, only 21 species have been determined its ability. However, not all of these species were validated for the chronic diseases mentioned by the Orang Asli (Table 4.8).

Table 4.8: List of common chronic diseases listed in NHMS III 2006 treated by the Orang Asli in this study using plant species

Chronic diseases	Plant species		
	Temuan	Mah Meri	Both
Hypertension	<i>Andrographis paniculata*</i> , <i>Archidendron jiringa</i> , <i>Averrhoa carambola*</i> , <i>Cnestis</i> sp., <i>Durio zibethinus</i> , <i>Eurycoma longifolia</i> , <i>Labisia pumila</i> , <i>Lasia</i> sp., <i>Musa acuminata</i> , <i>Parkia speciosa</i> , <i>Pereskia bleo</i> , <i>Piper</i> sp., <i>Polyalthia bullata</i> , <i>Tacca</i> sp. and <i>Tetracera indica</i>	<i>Carica papaya*</i> , <i>Catharanthus roseus*</i> , <i>Centella asiatica*</i> , <i>Cinnamomum</i> sp., <i>Momordica charantia*</i> , <i>Morinda citrifolia*</i> , <i>Nypa fruticans</i> , <i>Stenochlaena palustris</i> and <i>Tinospora crispa</i>	<i>Imperata cylindrica*</i> , <i>Melastoma sanguineum</i> and <i>Orthosiphon aristatus*</i>
Diabetes mellitus	<i>Andrographis paniculata*</i> , <i>Archidendron bubalinum</i> , <i>A. jiringa*</i> , <i>Averrhoa carambola*</i> , <i>Cnestis</i> sp., <i>Durio zibethinus*</i> , <i>Eurycoma longifolia*</i> , <i>Leucaena leucocephala*</i> , <i>Muntingia calabura*</i> , <i>Parkia speciosa*</i> , <i>Pereskia bleo</i> , <i>Polyalthia bullata</i> , <i>Smilax myosotiflora</i> and <i>Tetracera indica</i>	<i>Acanthus ilicifolius</i> , <i>Centella asiatica*</i> , <i>Momordica charantia*</i> , <i>Morinda citrifolia*</i> , <i>Nypa fruticans*</i> , <i>Phyllanthus amarus*</i> , <i>Stenochlaena palustris</i> and <i>Tinospora crispa*</i>	<i>Imperata cylindrica</i> and <i>Orthosiphon aristatus*</i>
Cancer	<i>Angiopteris evecta*</i> , <i>Cyathea mollucana</i> , <i>Donax canniformis</i> , <i>Elateriospermum tapos*</i> , <i>Elettariopsis curtisii</i> and <i>Pereskia bleo*</i>	<i>Acanthus ilicifolius*</i> and <i>Musa</i> sp.1	-
Asthma	<i>Dillenia</i> sp., <i>Fagraea obovata</i> , <i>Poikilospermum suaveolens</i> and <i>Polyalthia bullata</i>	<i>Acanthus ilicifolius</i> and <i>Uncaria lanosa</i>	-
Skin disease	-	<i>Morinda citrifolia*</i>	-
Tuberculosis	-	<i>Acanthus ilicifolius</i>	-

* Species that has been validated scientifically to treat the specific ailment(s) listed

Archidendron jiringa, *Durio zibethinus*, *E. longifolia*, *Nypa fruticans*, *Parkia speciosa* and *Tinospora crispa* for example were found capable in treating diabetes, only. Both *A. ilicifolius* and *Pereskia bleo* meanwhile have been proven to treat cancer, only. Additionally, not all of the determined species were proven using the same part of plant as the Orang Asli. *Nypa fruticans* for instance was determined by Reza *et al.* (2011) to possess antihyperglycaemic effect. However, instead of using its young fruit cluster as used by the Orang Asli (Appendix 3), they used the methanolic extract of its leaf and stem.

According to NHMS III about 7.9 % or 1.7 million persons suffer from hypertension in Malaysia (Amal *et al.*, 2011). This placed the disease as the most prevalent chronic disease in Malaysia. World Health Organisation (WHO) meanwhile had estimated about one billion people worldwide suffered from this chronic disease (World Health Organisation [WHO], 2011). Only nine out of twenty-seven species of plants used in Table 4.8 to treat hypertension have been proven its ability in lowering the risk if not totally cure it.

Imperata cylindrica for example was validated by Mak-Mensah, Komlaga and Terlabi (2010) to treat hypertension. However, the compound used by them for validation purpose was extracted from its leaf instead of its root and runner as utilized by the Orang Asli. Although this species was also used by both tribes to treat diabetes, no evidence was found to support its ability to treat this disease (Villaseñor & Lomadrid, 2006). *Imperata cylindrica* was also used as a diuretic, febrifuge, antihelminthic, treat hepatitis, hepatic cirrhosis, muscle pain, postpartum, typhus, snake bite, scorpion bite, coagulation, colic, kidney infection and toothache by the Tamang of Nepal; Akha of Thailand and China, in Philippines, India, China, Indonesia; and Uganda (Au *et al.*, 2008; Inta, Shengji, Balslev, Wangpakapattanawong & Trisonthi, 2008; Katewa, Guria & Jain, 2001; Langenberger, Prigge, Martin, Belonias &

Sauerborn, 2009; Roosita, Kusharto, Sekiyama, Fachrurozi & Ohtsuka, 2008; Tabuti, Lye & Dhilion, 2003; Tamang, 2003; Wright, Van-Buren, Kroner & Koning, 2007). The Semang used the powder made from the whole plant as antimicrobial medicine. The powder was applied on wound (Samuel *et al.*, 2010). The Malays on the other hand, infused or decocted its root for various maladies. This includes asthma, breathlessness, difficult urination, urinary stone, headache and as febrifuge (Ong & Nordiana, 1999; Ong, Rosnaini & Pozi, 2011c; Ong, Ruzalila & Pozi, 2011d). Among the Kadazan Dusun in Crocker Range, Sabah, the root decoction of this species was used to treat fever, chicken pox, measles, urinary complaints and acute toxic hepatitis (Fasihuddin & Ghazally, 2003).

Another grass and weed species used by the Orang Asli in this study was *Lopatherum gracile* (Plate 4.9). However, it was not used in treating chronic diseases. Instead, it was used by the Temuan in Kolam Air and Sungai Jang to increase fertility or treat barrenness. The decoction of its root (with nodules) was taken orally for this purpose (Appendix 3). In contrast to this plant effect, i.e. as contraceptive were *Mapania* sp. and *Syzygium* sp. In Ulu Kuang, the shoot of *Mapania* sp. was eaten raw with *P. betel* leaf. Meanwhile in Broga Village, the bark decoction of *Syzygium* sp. was drunk twice a day for one month while refraining from any sexual activity to prevent pregnancy (Appendix 3). In Kampung Padang, Ulu Langat, Selangor, *Aneilema lineolatum* was used as a contraception and to stop menstruation (Ong, 1986).

Several species namely *P. bullata*, *Stenochlaena palustris* and *Tetracera indica* were used in treating more than one disease listed in Table 4.8. However, no evidence of scientific findings determining their ability to treat the diseases in this study could be found. The Mah Meri in Sungai Judah used *S. palustris* in treating diabetes and hypertension, along with diarrhoea by taking its frond soup orally (Appendix 3). This species was commonly used as febrifuge and in treating diarrhoea by the Malay and

Jakun (Khamis, Faridah-Hanum, Manap & Mokhtar, 2006; Ong *et al.*, 2011c). Gwynne-Vaughn (as cited in Burkill, 1966a) on the other hand has reported its utilization in Siam (former name for Thailand) and Sumatra as a mild laxative. The Temuan in Kuala Kubu Bharu i.e. Kuala Kerling Orang Asli Village meanwhile used it as tonic (Nur Awanis, 2009).



Plate 4.9:
Lophatherum gracile Brogn. (Poaceae) (left) and roots with nodules (right)

Tetracera indica was used in Broga Village for hypertension and diabetes. Its root decoction was drunk three times a day i.e. in the morning, afternoon and evening for both diseases (Appendix 3). The Malays also used this species to treat hypertension and fever. However, instead of its root decoction, the decoction of its leaf and climbing stem was drunk. Fever meanwhile was treated by applying its leaf infusion topically (Ong & Nordiana, 1999; Ong *et al.*, 2011d). *Tetracera indica* was also used to alleviate inflammations and itchiness, treat snakebite poison, suppurating fingers, cold, pulmonary haemorrhage and aphthae (Burkill, 1966a; van Valkenburg & Bunyaphatsara, 2002; Wiart, 2002). In East Kalimantan, the Dayak Tunjung used its leaf for wound (Setyowati, 2010). Due to its coarse leaf surface, the Jakun used it as

sandpaper on wood surfaces (Khamis *et al.*, 2006) and was widely used in Malaya (Burkill, 1966a). Tok Jenang from Broga Village meanwhile mentioned that the leaf could be used for scrubbing pot.

Asthma was treated using seven species of plants by the Orang Asli. This disease is most commonly triggered by allergic reaction, causing the narrowing and blocking of airways in lungs (Adcock, 1997). The compounds responsible in treating asthma in plant species used by the Orang Asli in this study, however, have not yet been validated and identified. In supporting this, Wiart (2006) has highlighted the lack of pharmacological study on *Fagraea obovata*. However, instead of asthma he suggested that this species should be investigated for analgesic and anti-inflammatory effect. In Ulu Kuang, *F. obovata* was used to treat asthma and cough using its root decoction (Appendix 3). Additionally, the leaf of this species was used in Indonesia for fever and headache (Burkill, 1966b; Wiart, 2006).

For *Uncaria lanosa* meanwhile, although no studies have been found to support its ability for asthma, its alkaloid extracts shows hypotensive effects *in vivo* (van Valkenburg & Bunyapraphatsara, 2002). In Malaysia and Papua New Guinea, it was used for diarrhoea, wound disinfectant, ulcer, inflamed intestines, relieve weakened bladder, fever, stomach ache and internal swelling (van Valkenburg & Bunyapraphatsara, 2002).

Tuberculosis has been estimated to have infected at least a third of the world's population (World Health Organisation [WHO], 2012b). It was treated by the Orang Asli using one species of plant i.e. *A. ilicifolius*. This shows that this disease probably does not affect the Orang Asli communities in this study. Another possibility was their reliance on modern medicine to treat this disease, as reported by Tunisan (2002). Apparently, most of the Orang Asli admitted to the JAKOA hospital were suffering from tuberculosis among other ailments and conditions. This includes malaria,

pregnancy and childbirth; acute gastroenteritis, asthma, respiratory tract infection, high fever and accidents (Tunisan, 2002).

Certain infectious diseases could cause an outbreak from time to time. The most prominent and frequent was dengue fever. No information of any plant species was mentioned to treat this disease. This could be due to the possibility of the Orang Asli seeking treatment for this disease in the hospitals nearby. During this study, an outbreak of Chikugunya fever (also vectored by mosquitoes) occurred in Gurney Village. Again, no mention was made on the treatment of this disease using plant species by the informants. The patients possibly received treatment from hospital. In addition, plausible treatment of this disease using plant species or their traditional knowledge was probably unavailable. This was because the disease was relatively new at that time.

Chronic diseases and conditions that the Orang Asli suffered today are varied. Siah Jalil from Tun Abdul Razak mentioned that the worse ailment that the Orang Asli faced previously was only fever. However, due to the high cost of travel and modern medicine at the hospitals during that time, it was treated using spells and incantations. She also said that the cause of these new diseases came from the vegetables sold at the markets. These vegetables were said to be contaminated with chemicals from the insecticides and fertilizers. Previously, their source of vegetables came only from the wild (from the forested areas near them). Nevertheless, the Orang Asli's exposure towards modern medicinal informations and facilities nowadays could also affect the variations of the ailments suffered by them as they have come to understand that symptoms such as fever and headache might be part of symptoms of a chronic disease.

4.4.2 Mushrooms

The medicinal mushrooms species recorded in this study numbered to 14 species of mushrooms from eight families (Appendix 4). Three species of mushrooms were

utilized by the Mah Meri tribe and 13 species of mushrooms by the Temuan tribe. A total of 29 ailments and conditions were treated by the Orang Asli using these species of mushrooms.

Lignosus rhinocerotis was used to treat 11 different ailments and conditions. This was followed by *Microporus xanthopus* and *Xylaria polymorpha* in treating eight and four ailments and conditions, respectively. *Lignosus rhinocerotis* and *M. xanthopus* were also the most commonly used among the Orang Asli villages i.e. in six villages, each. These species were followed by *Auricularia auricula-judae* in three villages. The third most commonly used medicinal mushroom species were *X. polymorpha* and *Pycnoporous sanguineus* in two villages, each.

Lignosus rhinocerotis was used by the Orang Asli in this study for asthma, high fever, headache, postpartum, cough, cold, tonic, lactagogue, enhance strength, physical fitness and overall health using its sclerotium (Appendix 4). These were quite similar to its traditional utilization in Malaysia, with an addition for breathlessness, food poisoning, wound and cancer as reported by Lee *et al.* (as cited in Lee, Tan, Fung, Pailoor & Sim, 2011). Its recognition however comes from the reports and studies on its ability to treat cancer. Unlike *E. longifolia*, this species has not been commercialized and exploited. This was due to its limited supplies (in the wild). Moreover, it was successfully cultivated, just recently (Tan, as cited in Lee *et al.*, 2011).

The vernacular name of *L. rhinocerotis* i.e. *Cendawan susu harimau* or “Tiger’s milk mushroom” was derived from the event that led to its growing. This species was said (and believed) to grow from fallen drops of tigress’ milk to the ground whilst feeding its cub. Batin Asu Dollah from Tun Abdul Razak however disagreed. He mentioned that it was not possible that the locations that the mushroom grew on (especially near the village) were originated from the drops of tigress’ milk. He added that from his observation, this mushroom species apparently grew near a tree from a fig

species. In Mah Meri language, this species was known as *Petih a'a*. The word “*petih*” meant *cendawan* or “mushroom”. Meanwhile the word “*a'a*” meant “tiger” (Kim, 2006). The term “*cendawan*” was also used by the Mah Meri to refer to mushroom species. This term was used when talking to outsiders and people who did not comprehend their language. Although the sclerotium of this species was often decocted, it was also mixed or eaten raw as medicine. According to Derus and Ina from Ulu Kuang, the raw sclerotium has a rather flavourless taste. Thus, it was preferably taken with *Piper betel* leaf, *Areca catechu* nut and slaked lime for asthma and breathlessness. Similarly, it was also eaten raw in Sungai Bumbun to enhance physical fitness and strength. The Semai used this species during paddy farming as they believed that it could restore the spirit of paddy, resulting an abundance of harvest for that season (Adi *et al.*, 2006).

Microporus xanthopus (Plate 4.10) may not be as well known or as rare as *L. rhinocerotis*. However, among the Orang Asli in this study, *M. xanthopus* were familiarly utilized with the ailments and conditions involving the female gender (Appendix 4). Its utilization, varied from lochia and postpartum to menstrual flow. In Kolam Air, the wife of Johari Buyong mentioned its ability to decrease lochia. This could shorten the normal postpartum confinement period (i.e. usually around 40 to 60 days). Moreover, it was used to reduce weight after childbirth. This was possibly by reducing excess fat and water retention. In Ulu Kuang, *M. xanthopus* was used to contract uterus (after childbirth) and as a contraceptive for women. According to Halimah Abdullah, its fruiting body was sliced and mashed with the liquid from chewing *P. betel* leaf. This liquid was applied from the back to front, and from the groin to the upper part of the stomach; for both ailments and conditions (Appendix 4). *Microporous xanthopus* was similarly used by the Temuan in Kampung Padang, Ulu Langat, Selangor for contraception. However Ong (1986) has reported that this brought

a permanent contraceptive effect, including for men. In Songkok Village, Apas a/p Katok meanwhile has mentioned that this species was able to stop menstruation by eating it raw. However, the reason behind this purpose was not mentioned. On the contrary, Lee and Chang (2007) reported that this species was used for menstrual problems. Apart from postpartum and menstruation, Tok Jenang from Broga Village mentioned that this species was used as an aphrodisiac for women. The infusion or tea of *M. xanthopus* was drunk for this purpose. In addition, both Chang and Lee (2003) and Lee and Chang (2007) reported that *M. xanthopus* was used to weaned children and; to relieve pain (of uterus) after childbirth. In India, the dried fruiting body was used for ear pain, fever and vomiting (Harsh, Rai & Soni, 1999).



Plate 4.10:
Microporous xanthopus (Fr.) Kuntze (Polyporaceae)

The most commonly treated ailment and condition by the Orang Asli using mushroom species was fever, with four species of mushrooms. It was followed by asthma with three species of mushrooms. Two mushroom species meanwhile were used as diuretic, to treat lung pain, nocturnal enuresis and for postpartum, each. According to Batin Asu Dollah from Tun Abdul Razak, mushroom species has a cooling effect or febrifuge. However, he added that newborn mothers were not allowed to any mushroom

species (edible or not) for six months from the day of childbirth. This was probably to avoid coldness from their bodies and decrease blood flow.

Nocturnal enuresis or bed-wetting among children was common even among the Orang Asli. The utilization of the liquid inside *X. polymorpha* (Plate 4.11) to treat this ailment or condition was proven effective. This was based from the personal experience of Batin Asu Dollah from Tun Abdul Razak. However, only a truly matured fruiting body that contained liquid was used for the treatment of nocturnal enuresis. The formulation to treat this ailment or condition was prepared by mixing the liquid with water. This formulation was taken orally. Batin Asu Dollah mentioned that the water was added since the liquid in one fruiting body was very small in quantity. This way, the amount of formulation would be enough to treat the ailment or condition. Batin Asu Dollah also added that it was rare to find the fruiting body containing the liquid. Apparently, this species was commonly used and quite popular with the Semai, Temuan and Bateq to treat nocturnal enuresis (Chang & Lee, 2003; Lee, Chang & Noraswati, 2009). In India meanwhile, the fruiting body of *X. polymorpha* was dried and powdered to induce lactation for newborn mothers (Harsh *et al.*, 1999). Another species used for nocturnal enuresis in this study was *Cookeina speciosa*. In Broga Village the infusion of its fruiting body was drunk (Appendix 4).

The majority of medicinal mushrooms in this study were utilized using its whole fruiting body, with 11 species of mushrooms. Two species meanwhile were utilized using the liquid inside its fruiting body and only one species was utilized using its sclerotium.

The preparation methods in traditional medicines were mainly applied to extract the active substances from (different) part(s) of natural resource to treat the ailments or conditions. Decoction or boiling the part(s) of natural resource(s) was often opted to extract the substance from natural resources with cellulose walls or cell walls (Stengler,

2005; Zhang, Cui, Cheung & Wang, 2007). Amongst the preparation of formulations using mushroom species, decoction was used to prepare nine formulations. It was followed by infusion for seven formulations and raw for six formulations. Although infusion was less opted than decoction, all medicinal mushroom species used by Tok Jenang in Broga Village were prepared via this method. However, this excludes *Xylaria* sp. (see Appendix 4).



Plate 4.11:
Xylaria polymorpha (Pers.) Grev. (Xylariaceae) fruiting bodies (left); liquid inside halved fruiting body (right)

The prepared formulations involved three ways of administrations. Sixteen formulations were drunk. Nine formulations meanwhile were either applied or eaten. Overall, 25 formulations (73.5 %) were taken orally and nine formulations (26.5 %) were applied topically.

The similarity coefficient for the medicinal mushrooms calculated using Jaccard Index (JI) results to 0.14. Only two species of mushrooms are similarly used by both Mah Meri and Temuan tribes i.e. *A. auricula-judae* and *L. rhinocerotis* (Table 4.9). However, their utilizations and preparations for these species differed from one another (Table 4.9).

Table 4.9: Comparison of medicinal mushroom species used by both Mah Meri and Temuan tribes

No.	Mycological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	
1.	<i>Auricularia auricula-judae</i> (Bull.) Quél. (Auriculariaceae)	Whole	Fever Induce labour and soften skin (pregnant women) Soften skin	Charred and applied	UK	-	
				-	-	Cooked and eaten	SB
				-	-	Boiled and eaten (in large quantities for better result)	SK
2.	<i>Lignosus rhinocerotis</i> (Cooke) Ryvarden (Polyporaceae)	Sclerotium	Asthma Cough and cold Enhance body strength and physical fitness High fever, headache, overall health Postpartum Tonic (men and women)	Decocted and drunk	BL, UK	-	
				Grated, dewed and mixed with <i>burung lilin</i> beak (if available) and drunk	KS	-	
				Cut and eaten raw	SJG	-	
				Decocted and drunk	UK	Eaten raw little by little until it is finished	SB
				-	-	-	-
				Decocted with <i>Akar kayu pengeras</i> , <i>Akar paku penavar</i> and <i>kayu jerah</i> . The decoction is drunk first thing in the morning. The amount of water depends on usage	HT	-	-
Decocted with <i>Polyalthia bullata</i> root and drunk	UK	-	-				
Eaten raw	HT	-	-				

(BL: Bukit Lagong Orang Asli Village; HT: Hulu Tamu Orang Asli Village; KS: Songkok Orang Asli Village; SB: Sungai Bumbun Orang Asli Village; SJG: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

Table 4.10 shows the total numbers of medicinal mushroom species mentioned in each Orang Asli village in this study. The highest number of mushroom species was mentioned in Broga Village with seven species. It was followed by Ulu Kuang with six species of mushrooms. Three villages meanwhile do not mentioned any species of mushrooms for medicine. These villages were Gurney Village, Sungai Judah and Sungai Rambai.

Table 4.10: Numbers of medicinal mushroom species mentioned in each Orang Asli village

Villages	Total numbers of medicinal mushroom species mentioned
Broga Village (B)	7
Bukit Lagong (BL)	2
Gurney Village (G)	0
Hulu Tamu (HT)	2
Kolam Air (KA)	2
Kepau Laut (KP)	1
Songkok Village (KS)	2
Sungai Bumbun (SB)	2
Sungai Judah (SJ)	0
Sungai Jang (SJG)	2
Sungai Kurau (SK)	1
Sungai Rambai (SR)	0
Tun Abdul Razak (TAR)	1
Ulu Kuang (UK)	6

Table 4.11 meanwhile shows the similar numbers of mushroom species between the villages in this study. The similarity coefficient between the villages in this study was calculated using JI from the numbers in Tables 4.10 and 4.11. The results are displayed in Figure 4.8. The highest similarity coefficient was 1.00. It was shown between Hulu Tamu – Songkok Village, Hulu Tamu – Sungai Jang and Songkok Village – Sungai Jang. Two similar medicinal mushroom species were used in these

villages specifically *L. rhinocerotis* and *M. xanthopus*. Similar utilization of *M. xanthopus* could be seen in Hulu Tamu and Sungai Jang for lochia (Appendix 4).

Table 4.11: Matrix of similar numbers of medicinal mushroom species used between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	0	-												
G	0	0	-											
HT	1	1	0	-										
KA	1	0	0	1	-									
KP	0	0	0	0	0	-								
KS	1	1	0	2	1	0	-							
SB	0	1	0	1	0	0	1	-						
SJ	0	0	0	0	0	0	0	0	-					
SJG	1	1	0	2	1	0	2	1	0	-				
SK	0	0	0	0	0	0	0	1	0	0	-			
SR	0	0	0	0	0	0	0	0	0	0	0	-		
TAR	0	0	0	0	1	0	0	0	0	0	0	0	-	
UK	2	1	0	2	1	0	2	2	0	2	1	0	0	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Four villages i.e. Gurney Village, Kepau Laut, Sungai Judah and Sungai Rambai on the other hand, did not show any similarity with other villages (Table 4.11 and Figure 4.8). During the interviews, most of the Mah Meri informants mentioned that they did not know about medicinal mushroom species.

Some medicinal mushroom species were very rare. Thus, only oral information could be obtained. One species of mushroom has been mentioned quite often by the informants. Its vernacular names were *Cendawan banyak anak* or *Cendawan kasih beranak* in Tun Abdul Razak, *Cendawan ibu anak* in Ulu Kuang, *Cendawan pengasih ibu* in Kolam Air and *Cendawan riba anak* in Bukit Lagong. This species was used to treat barren couples (especially women). Although descriptions of this species were given, specific identification could not be made. Moreover, no specimen of this species

could be obtained during this study. Similar descriptions of the species were given by Batin Asu Dollah from Tun Abdul Razak and the wife of Johari Buyong from Kolam Air. According to them, this species has two different sizes of fruiting bodies. One fruiting body, which was larger than the others, was called *ibu* or “mother”. The smaller size fruiting bodies meanwhile were called *anak* or “children”. They were called “children” since they grew underneath of “mother”. The selection of its vernacular names possibly arise from this condition, as it portray of a mother protecting her children. Derus from Ulu Kuang mentioned that this species resembles *Termitomyces heimii* although it was bigger in size. This was possibly referred to the *ibu*. The species was white in colour, regardless of its size. In Kolam Air, all of the smaller sized fruiting bodies (*anak*) were decocted. This decoction was drunk little by little, twice a day (morning and night) until the woman becomes pregnant. During this time, the woman was not allowed to pick any flowers or chillies (bird eyes chillies or *cili api*). The wife of Johari Buyong from Kolam Air mentioned that she had given this mushroom species to a barren woman (as medicine) once. After a few months, the woman entered pregnancy. In Tun Abdul Razak however, this species needed to be cooked thoroughly. Failure to do so could cause dizziness. In addition, some informants mentioned that this species was edible and consumed i.e. in Bukit Lagong, Tun Abdul Razak and Ulu Kuang. According to Derus from Ulu Kuang, this species was very hard to find even to a knowledgeable person. He also added that this species would turn to frog if it were not collected past its maturity. In contrast to other informants, he said that its affect to increase fertility was just in its vernacular name only.

4.4.2.1 The most common chronic diseases in Malaysia treated by the Orang Asli in Selangor using mushroom species

Only one chronic disease (as listed in NHMS III) was treated using mushroom species, namely asthma. This disease was treated by the Orang Asli in this study using three species of mushrooms. These species were *Ganoderma* sp., *L. rhinocerotis* and *X. polymorpha* (Table 4.12 and Appendix 4). Different part of these mushrooms however was used from each species to treat this disease. *Ganoderma* sp. for example was used in Bukit Lagong using its fruiting body. *Lignosus rhinocerotis* meanwhile was used in Bukit Lagong, Songkok Village, Sungai Jang and Ulu Kuang using its sclerotium. *Xylaria polymorpha* on the other hand was used in Kolam Air using the liquid inside its fruiting body.

Table 4.12: List of common chronic diseases listed in NHMS III 2006 treated by the Orang Asli in this study using mushroom species

Chronic diseases	Plant species		
	Temuan	Mah Meri	Both
Asthma	<i>Ganoderma</i> sp., <i>Lignosus rhinocerotis</i> and <i>Xylaria polymorpha</i>	-	-

In Bukit Lagong and Ulu Kuang, the sclerotium of *L. rhinocerotis* was merely decocted and drunk. While in Sungai Jang, its sclerotium was cut and eaten raw. In Songkok Village however, the sclerotium was grated and left to dew. The dewing method involved exposing the materials to dew overnight (Gimlette & Thomson, 1971). It was later mixed with *burung lilin*'s beak and drunk (Table 4.9). The species of *burung lilin* was not mentioned by the informants. According to the Malays, this bird species belongs to a hornbill species from the genus *Anthracoceros* (Burkill, 1966b).

While the fruiting body's of *Ganoderma* sp. was decocted and drunk, the liquid inside the *X. polymorpha* on the other hand was drunk, raw (Appendix 4). Unfortunately, no scientific studies have been found to validate the utilization of these species to treat asthma.

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.00	1.00												
G	0.00	0.00	1.00											
HT	0.13	0.33	0.00	1.00										
KA	0.13	0.00	0.00	0.33	1.00									
KP	0.00	0.00	0.00	0.00	0.00	1.00								
KS	0.13	0.33	0.00	1.00	0.33	0.00	1.00							
SB	0.00	0.33	0.00	0.33	0.00	0.00	0.33	1.00						
SJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00					
SJG	0.13	0.33	0.00	1.00	0.33	0.00	1.00	0.33	0.00	1.00				
SK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	1.00			
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00		
TAR	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
UK	0.18	0.14	0.00	0.33	0.14	0.00	0.33	0.33	0.00	0.33	0.17	0.00	0.00	1.00

Figure 4.8: Matrix of similarity coefficient of medicinal mushroom species between the villages in this study using Jaccard Index (JI) (data from Tables 4.10 and 4.11) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Other than for prevalent chronic diseases, medicinal mushroom species should be explored to treat other conditions as well, as much as other natural resources. Two species that should be taken into consideration for further studies (to validate its utilization) are *X. polymorpha* for urinary related conditions and *M. xanthopus* for gynaecological conditions.

4.4.3 Animals

Possibly no complete record of ethnozoology has been made on the Orang Asli. As Ong (1986) stated, most of the animal species were mainly used as a source of protein only. Gimlette and Thomson (1971) and Burkill (1966a, 1966b) have managed a small number of ethnozoological records especially regarding its medicinal utilization. However, it was mostly incorporated, addition or side ingredients for the recipes of medicines involving plant species.

Only several of the informants interviewed in this study could provide the information regarding medicinal animals. Frequent response received was “... *binatang tak guna buat ubat*” or “... the animal species were not used medicinally”. This shows the importance of recording the ethnozoological knowledge from these knowledgeable individuals.

Forty-seven species of animals from 33 families were used by the Orang Asli in Selangor as medicine (see Appendix 5). These medicinal animals were used in treating 41 ailments and conditions. A sum of 27 animal species were used by the Mah Meri tribe while 26 species by the Temuan tribe. This reveals that the medicinal animal species was the only natural resource that the Mah Meri used more than the Temuan. All of these 47 species of animals were obtained by both tribes in the wild.

Python reticulatus was used to treat the highest number of ailments and conditions with 12 different ailments and conditions. This species was followed by

Cuora amboinensis and *Channa striata* with seven and six ailments and conditions, respectively. *Nycticebus coucang* meanwhile was the most frequently used species i.e. in eight out of 14 villages. *Python reticulatus* and *C. amboinensis* on the other hand, were the second and third- most frequently used animal species i.e. in seven and five villages, respectively.

Python reticulatus was used in all Mah Meri villages and two Temuan villages (Kolam Air and Sungai Jang). Its gall, meat and fat were used as medicines in these villages (Appendix 5). This species was called *tijau* by Rosita Layon from Sungai Kurau (Mah Meri village). According to the Mah Meri dictionary by Kim (2006), “*tijau*” meant “*ular*” or “snake”. Whilst *ular sawa* (another vernacular name for *P. reticulatus*) in Mah Meri language was *tijau sawak* (Kim, 2006).

The gall of *P. reticulatus* was used in four villages for chicken pox. The gall was dried or parched. A very small piece (about the size of a ball-pen point – according to Batin Sidin anak Bujang from Sungai Bumbun) of it was infused in water. The infusion (along with the gall piece) was taken orally (Appendix 5). According to several informants, the infusion was very bitter and has a fishy smell (*hanyir*). However, it has a clear and transparent colour, as mentioned by Batin Sidin anak Bujang from Sungai Bumbun. Alternatively, in Sungai Bumbun and Kepau Laut the entire dried gall was used. However, after soaking, the gall was taken out and re-dried where it was re-used to treat the same or different ailments and conditions. The duration (of the gall soaked or steeped in water) differed amongst the informants. For example, Ayob anak Bongkol and Yong Haji Khamis from Kepau Laut mentioned that it should be about 50 minutes. Batin Sidin anak Bujang from Sungai Bumbun meanwhile stated around 30 to 45 minutes. In Kolam Air, the gall was soaked about two to 3 minutes only. Other ailments and conditions treated using the gall of *P. reticulatus* (with similar preparation as mentioned above) were malaria, measles, fever, jaundice and enhancing body immunity

(Appendix 5). According to Batin Zamzam @ Salim Abdullah from Kepau Laut, the gall of *P. reticulatus* was also used to treat *demam kura-kura* (Appendix 5). Whether this ailment or condition was similar to the *demam kura-kura* mentioned in Songkok Village, (treated using *Homalomena sagittifolia* in Chapter 4.4.1) cannot be ascertained. This was due to the lack of detail given regarding this ailment or condition.

Ayob anak Bongkol meanwhile mentioned that he used to catch snakes back in the days. Apparently, the price of snakes was quite high. Furthermore, its gall was sought after by *senseh* (Chinese medicine men) with the price about RM 50.00 per gall for *P. reticulatus*. In India, the gall of *P. reticulatus* was used for snake and spider bites. Its fat meanwhile was used for rheumatic pain, toothache, burn and aches (Jamir & Lal, 2005; Padmanabhan & Sujana, 2008). Besides *P. reticulatus*, the Orang Asli also used the gall from *Antherurus macrourus*, *C. amboinensis* and *Helarctos malayanus*. The gall from each of these species were similarly prepared and applied as *P. reticulatus*' (Appendix 5).

The meat of *P. reticulatus* on the other hand was used as febrifuge in Sungai Bumbun and Sungai Judah. According to Ayob anak Bongkol from Kepau Laut, the meat of *P. reticulatus* has the effect of decreasing body temperature. He also mentioned that *P. reticulatus* was the only snake species that they used medicinally, as other species of snakes (especially venomous species, such as cobra) could pose danger to their life. However, in Ulu Kuang, the Temuan also used *P. brongersmai* to treat cold (Appendix 5). The most likely explanation would be, instead of the species *P. reticulatus*, the genus *Python* that was used medicinally by the Orang Asli. Unlike the Orang Asli in this study, venomous snake species were also used medicinally in India. These species includes *Vipera russelli*, *Ptyas mucosus* and *Ancistrodon himalayans* for promoting eyesight, excretion of stools and flatus; and diuretic using its meat (Negi & Palyal, 2007).

Despite the use of its gall for high fever in Sungai Bumbun, the main part of *C. amboinensis* (Plate 4.12) as medicine was its fat. It was used to treat sprain, burn, fracture, cramp and injury. Sprain was treated (mentioned) in five villages i.e. Bukit Lagong, Kepau Laut, Sungai Bumbun, Sungai Judah and Sungai Rambai. Meanwhile burn, fracture, cramp and injury were treated (mentioned) in Bukit Lagong and Sungai Bumbun (Appendix 5). Ayob anak Bongkol and Yong Haji Khamis from Kepau Laut mentioned that the amount of fat from a *C. amboinensis* varied according to the moon phases. The highest amount of fat could be obtained during full moon. This condition was similar to the size of *Smilax myosotiflora*'s tuber (as mentioned by Tok Jenang from Broga Village in Chapter 4.4.1). The preparation of the fat from *C. amboinensis* involved several methods of preparation. In Bukit Lagong and Sungai Bumbun, the fat was cooked until it turns into oil. This was in contrast with the preparations in Kepau Laut, Sungai Judah and Sungai Rambai. In Kepau Laut, the raw fat was mixed with coconut oil. In Sungai Judah and Sungai Rambai on the other hand, the raw fat was stored directly into a container or bottle for some amount of time. The fat was left to turn into an oily substance by itself. Prior to its utilization in Sungai Rambai, the fat was mixed with coconut oil (Table 4.13). According to Tok Anin from Sungai Rambai, the fat was not cooked since it would decrease its efficacy. This contradicts with the method used in Bukit Lagong and Sungai Bumbun. Other species of animals used by the Orang Asli using its fat were *Lepidochelys olivacea* (*Kura-kura laut*) and *P. reticulatus* by the Mah Meri, while *Tomistoma schlegelli* (*Buaya*) and *Varanus* sp. (*Biawak*) by the Temuan (Appendix 5).

Sixteen animal species were used to treat asthma. It was followed with breathlessness and fracture with five species, each. Injuries, promotes healing, strengthen body and wound meanwhile was treated with four species, each. Breathlessness referred to a condition called *lelah* or *semput* by the Orang Asli.

According to Gimlette and Thomson (1971), the condition called “*lelah*” refers to “spasmodic asthma”. The terms used in Gimlette and Thomson were translated from Malay words. From time to time, the conditions and terms used by the Malay might integrate in the Orang Asli language. However, it is best to think that “breathlessness” is different from “asthma” despite both belongs to the respiratory or pulmonary disease category. This is due to the terms and definition used by the Orang Asli may differ from the Malays.



Plate 4.12:
Cuora amboinensis Daudin (Geoemydidae)

Fracture or broken bones meanwhile was treated using chicks (newborn) and fat, with three and two species, respectively (Appendix 5). The newborn chicks were taken from *Centropus bengalensis*, *C. rectunguis* and *Copsychus malabaricus*. The newborn chick of *C. rectunguis* and *C. malabaricus* were cooked in coconut oil until all its bones were dissolved. The oil was applied or massaged on the fractured areas. Both of these species was mentioned in Sungai Bumbun (Appendix 5). *Centropus bengalensis* meanwhile was not taken directly from its nest as the two previously mentioned species. Instead, its wing was snapped broken. According to Batin Dollah anak Kadir from

Sungai Rambai, the chick was taken and cooked in coconut oil, if it healed within one week.

The method of preparation used for *C. bengalensis* was also applied in Kepau Laut for *C. rectunguis* and *C. sinensis*. Rather than its wing, its leg was sprained until broken for *C. rectunguis*. This action was done seven times, while allowing the chick to heal between each injury. According to Batin Zamzam, after the chick healed for the seventh times, it was then taken from its nest and starved. The carcass was dried and placed in a container or bottle containing coconut oil. This mixture was used as medicated oil for various maladies.

The preparation of *C. sinensis* chick was very similar to *C. retunguis*, right down to mixing (or placing) the carcass in coconut oil. The only difference was that the broken leg of *C. sinensis* chick was allowed to heal for three times only, according to Ayob anak Bongkol and Yong Haji Khamis. They added that the sound made by *C. sinensis* at dusk sounded (and believed) as cursing to people. However, it might symbolize a death in the area, as well. In India, the flesh of *C. sinensis* was used for asthma, tonsillitis, rheumatic pain and body ache. The powdered bone meanwhile was suspended in water and instilled in aching ear (Dixit, Kadavul, Rajalakshmi & Shekhawat, 2010; Jamir & Lal, 2005).

The Orang Asli has been an observer to nature since the time of their ancestors. The utilization of *C. bengalensis*, *C. rectunguis*, *C. sinensis* and *C. malabaricus* were based from the observations made on these species. According to Batin Sidin anak Bujang from Sungai Bumbun, they believed there was a substance used by the chick's mother to heal the chick's injury. This substance was probably able to treat similar injury posed on the chick. Not only the substance remains unknown but the materials and the method of medication given by the chick's mother was a mystery. There were many questions surrounding the perception and the method applied. For instance, if the

medicine was given topically, did it seeped into the chick or dissolved when dried? Were the medicine obtained from the surrounding or the mother, such as its saliva; or the chick? Will the substance breakdown by heating, and so on.

Several parts of an animal were involved and used as medicine. The majority of 22 species recorded were utilized using its meat. This was followed by fat from six species and gall from four species. The meat used from the species recorded in this study was mainly cooked and consumed. It was mostly used to treat asthma i.e. from seven species of animals (Appendix 5).

Twenty-five formulations were prepared by cooking the animal part(s). This was followed by raw with 13 formulations. Dried and infused (both used as one method of preparation) meanwhile was used in preparing five formulations. In terms of their administration, the formulations were mostly eaten i.e. 30 formulations. It was followed by applied and drunk with 19 and 16 formulations, respectively. Only two types of applications i.e. oral and topical were involved for the formulations made from animal species by the Orang Asli. Fifty formulations were taken orally while 26 formulations applied topical.

Table 4.13 detailed five species of animals used by both Mah Meri and Temuan in this study. Only two species of animals were used similarly in terms of ailments and conditions, parts, preparation and application by both tribes. These species were *C. amboinensis* for sprained and *N. coucang* for wound. The animal species used in treating similar ailments and conditions, despite different parts, preparation and application by both tribes was shown Table 4.14. None of these ailments and conditions however was treated using more than one species of animal.

Channa striata was one of the species used by both tribes to promote healing of wound, post-surgery, accident and postpartum (Tables 4.13 and 4.14). This species' ability to promote healing was not recently discovered as it has been commercialized

and sold in concentrated form. The meat of this species was cooked alone or in soup, and eaten mainly in Tun Abdul Razak and Sungai Bumbun. In addition, the Mah Meri also used this species to induce labour and ease in child delivery in Sungai Bumbun. The soup made from the meat of this species was eaten during the seventh to eighth month of pregnancy. In Sungai Kurau, it was used for wound (internal, external muscle and tissues) and waist pain (Table 4.13).

The total numbers of animal species mentioned as medicine in each village are shown in Table 4.15. The highest number of medicinal animal species was mentioned in Sungai Bumbun with 15 species. This was followed by Ulu Kuang with eight species and Kepau Laut with seven species of animals. No medicinal animal species, however, was mentioned in Hulu Tamu and Songkok Village.

Table 4.16 shows the number of similar animal species used between the villages in this study. Very low similarity could be observed. The highest was shown between Kepau Laut – Sungai Bumbun with 3 species, only. The highest number of similar animal species between Mah Meri and Temuan villages meanwhile was shown between Kepau Laut – Sungai Jang. They shared two similar species namely *N. coucang* and *P. reticulatus* (Table 4.13).

Similarity coefficient between each village was calculated using JI and tabulated as matrix in Figure 4.9. The highest similarity coefficient was shown between Gurney Village – Tun Abdul Razak with 0.25. This was followed by Kolam Air – Sungai Jang, Kepau Laut – Sungai Judah and Kepau Laut – Sungai Rambai, with 0.22. Meanwhile, Broga Village – Bukit Lagong, Broga Village – Gurney Village, Gurney Village – Sungai Jang and Kepau Laut – Sungai Jang shows the similarity coefficient of 0.20.

Table 4.13: Comparison of medicinal animal species used by both Mah Meri and Temuan tribes

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	
1.	<i>Achatina fulica</i> Ferussac (Achatinidae)	Meat	Asthma and breathlessness	Boiled with salt and eaten	UK	Mixed with ashes, boiled and eaten.	SK
2.	<i>Channa striata</i> Bloch (Ophiocephalidae)	Meat	Postpartum, accident and post-surgery	Cooked and eaten	TAR	-	-
			Promote wound healing Induce labour	- -	- -	Cooked in soup and eaten Cooked in soup and eaten by 7 to 8 month pregnant women	SB SB
3.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Whole	Internal and external wound, waist pain, heals muscle and tissues	-	-	Cleaned with lime juice to rid the mucus, boiled and prepared into a soup with black pepper, onion, salt and chillies. The soup is drunk until it is finished	SK
			Sprained	Cooked until it turns into an oily substance and applied on the affected area	BL	Mixed with solitary coconut (<i>kelapa tunggal</i>) oil and applied to the sprained areas until it heals	KP

Table 4.13: (continued)

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			Village(s)
				Temuan	Village(s)	Mah Meri	
						<p>Cooked until it turns to oil and massaged on the affected area</p> <p>Placed in a bottle until it produces oily substances or the fat is cooked until it produces an oily substance or the fat is infused with coconut oil and stored. The oil is applied on the pained areas</p>	<p>SB</p> <p>SJ</p>
3.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Fat	<p>Sprained</p> <p>Massage oil (aches, weak knees, muscle strain)</p>	-	-	<p>Taken and kept for some time and later mixed with coconut oil before applying to fractured or sprained areas</p> <p>Placed in a bottle until it produces oily substances or the fat is cooked until it produces an oily substance or the fat is infused with coconut oil and stored. The oil is applied on the affected areas</p>	<p>SR</p> <p>SJ</p>

Table 4.13: (continued)

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
3.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Fat	Burn and fracture	Cooked until it turns into an oily substance and applied on the affected area	BL	-	-
			Injuries and cramps	-	-	Cooked until it turns to oil and massaged on the affected area	SB
		Gall	High fever	-	-	-	Dried and a small part of it is infused in a glass of water and the water drunk
4.	<i>Nycticebus coucang</i> Boddaert (Loridae)	Fur	Wound	The fur from alive or dead (died suddenly) is placed in the wound and wrapped with a cloth Cut and placed in the wound.	KA B, BL, G, UK	Cut and placed in the wound	KP
			Wound	The wound is cleaned and the fur is placed in the wound. The wound is wrapped with a cloth	TAR		
		Bones	Wound	Filed and the powder is placed in the wound Filed and the powder is patched on the wounded area Filed and the powder is applied to the wound	G, UK KA SJG	-	-

Table 4.13: (continued)

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
4.	<i>Nycticebus coucang</i> Boddaert (Loridae)	Underarm hair	Wound	Placed in the wound and it would usually heal in 3 days	SJG	-	-
		Whole (without fur)	Strengthen body	Prepared into an oily substance and applied on the affected area	BL	-	-
5.	<i>Python reticulatus</i> Schneider (Boidae)	Gall	Chicken pox	Parched and infused with a little water. The water is drunk and the gall is swallowed	KA	Dried and infused in warm water for 50 minutes. The water is drunk	KP
						Dried and a small part of it is infused in a half glass of water and drunk	SB
						Dried and a little or whole part of it is infused in water and drunk	SR
			Tuberculosis	A small or whole part is swallowed raw	SJG	-	-
	Malaria	-	-	Dried and infused in warm water for 50 minutes. The water is drunk	KP		
	Measles	Infused in lukewarm water about 2 to 3 minutes. The water is drunk	KA	-	SK		

Table 4.13: (continued)

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			Village(s)
				Temuan	Village(s)	Mah Meri	
5.	<i>Python reticulatus</i> Schneider (Boidae)		Fever	-		Dried and a small piece is cut from it. It is then infused in water and drunk	SJ
			Enhance body immunity	-		Dried and a small part of it is infused in a half glass of water. The water is drunk	SB
			Asthma	-		Dried and a small part of it is infused in a half glass of water. The water is drunk	SB
			Jaundice	-		Dried and a little or whole part of it is infused in water. The water is drunk	SR
		Fat	Cramps and sprained	-		Dried and a small part of it is infused in a half glass of water. The water is drunk	SB
			High fever	-		Cooked until it turns to oil. The oil is massaged on the cramped area	SB
		Meat		-		Dried and a little or whole part of it is infused in water. The water is drunk	SR
				-		Cooked with the skin and eaten	SB

Table 4.13: (continued)

No.	Zoological name	Part(s) used	Ailment(s) or condition(s) treated	Preparation and administration			
				Temuan	Village(s)	Mah Meri	Village(s)
5.	<i>Python reticulatus</i> Schneider (Boidae)	Meat	Strengthen body and overall health Asthma	- -	- -	Cooked in curry and spices and eaten Cooked in soy sauce or curry dish and eaten	SJ SK

(B: Broga Orang Asli Village; BL: Bukit Lagong Orang Asli Village; G: Gurney Orang Asli Village; KA: Kolam Air Orang Asli Village; KP: Kepau Laut Orang Asli Village; SB: Sungai Bumbun Orang Asli Village; SJ: Sungai Judah Orang Asli Village; SJK: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; SR: Sungai Rambai Orang Asli Village; TAR: Tun Abdul Razak Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

Table 4.14: Ailments or conditions treated by both tribes using the same species of animals

Ailment or condition	Animal species used in treating the ailment or condition
Asthma	<i>Achatina fulica</i>
Breathlessness	<i>Achatina fulica</i>
Chicken pox	<i>Python reticulatus</i>
Promote healing	<i>Channa striata</i>
Sprained	<i>Cuora amboinensis</i>
Wound	<i>Nycticebus coucang</i>

Table 4.15: Numbers of medicinal animal species mentioned in each Orang Asli village

Villages	Total numbers of medicinal animal species mentioned
Broga Village (B)	5
Bukit Lagong (BL)	6
Gurney Village (G)	1
Hulu Tamu (HT)	0
Kolam Air (KA)	6
Kepau Laut (KP)	7
Songkok Village (KS)	0
Sungai Bumbun (SB)	15
Sungai Judah (SJ)	4
Sungai Jang (SJG)	5
Sungai Kurau (SK)	6
Sungai Rambai (SR)	4
Tun Abdul Razak (TAR)	4
Ulu Kuang (UK)	8

Table 4.16: Matrix of similar numbers of medicinal animal species used between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	2	-												
G	1	1	-											
HT	0	0	0	-										
KA	1	1	1	0	-									
KP	1	2	1	0	2	-								
KS	0	0	0	0	0	0	-							
SB	0	1	0	0	1	3	0	-						
SJ	0	1	0	0	1	2	0	2	-					
SJG	1	1	1	0	2	2	0	1	1	-				
SK	0	0	0	0	1	1	0	2	1	1	-			
SR	0	0	0	0	1	2	0	2	2	1	1	-		
TAR	1	1	1	0	1	1	0	1	0	1	1	0	-	
UK	2	2	1	0	1	1	0	0	0	1	1	0	1	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.22	1.00												
G	0.20	0.17	1.00											
HT	0.00	0.00	0.00	1.00										
KA	0.10	0.09	0.17	0.00	1.00									
KP	0.09	0.18	0.14	0.00	0.18	1.00								
KS	0.00	0.00	0.00	0.00	0.00	0.00	1.00							
SB	0.00	0.05	0.00	0.00	0.05	0.16	0.00	1.00						
SJ	0.00	0.11	0.00	0.00	0.11	0.22	0.00	0.12	1.00					
SJG	0.11	0.10	0.20	0.00	0.22	0.20	0.00	0.05	0.13	1.00				
SK	0.00	0.00	0.00	0.00	0.09	0.08	0.00	0.11	0.11	0.10	1.00			
SR	0.00	0.00	0.00	0.00	0.11	0.22	0.00	0.12	0.33	0.13	0.11	1.00		
TAR	0.13	0.11	0.25	0.00	0.11	0.10	0.00	0.06	0.00	0.13	0.11	0.00	1.00	
UK	0.18	0.17	0.13	0.00	0.08	0.07	0.00	0.00	0.00	0.08	0.08	0.00	0.09	1.00

Figure 4.9: Matrix of similarity coefficient of medicinal animal species between the villages in this study using Jaccard Index (JI) (data from Tables 4.15 and 4.16) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

4.4.3.1 The most common chronic diseases in Malaysia treated by the Orang Asli in Selangor using animal species

Four chronic diseases listed in NHMS III were treated by the Orang Asli in this study using animal species. Unlike plant or mushroom species, animal species were more commonly used to treat asthma (Table 4.17). The admittance of Orang Asli in hospital due to severe asthma cases between the year 2000 to 2005 however were very low, with a mean of 0.02 % only (Ministry of Health, as cited in Ngui, Lim, Chow, Bruyne & Liam, 2011).

Table 4.17: List of common chronic diseases listed in NHMS III 2006 treated by the Orang Asli in this study using animal species

Chronic diseases	Plant species		
	Temuan	Mah Meri	Both
Asthma	<i>Dinopium javanense</i> , <i>Dryocopus javensis</i> , <i>Hylobates</i> sp., <i>Hystrix brachyura</i> , <i>Muntiacus muntjak</i> , <i>Picus puniceus</i> , <i>Pteropus vampyrus</i> and <i>Scolopendra subspinipes</i> ssp. <i>dehaani</i>	<i>Callosciurus prevostii</i> , <i>Gallus gallus</i> , <i>Irmengardia pilosimana</i> , <i>Periopthalmus</i> sp., <i>Python reticulatus</i> , <i>Scolopendra</i> sp. and <i>Scylla</i> sp.	<i>Achatina fulica</i>
Diabetes mellitus	-	<i>Gallus gallus</i>	-
Hypertension	-	<i>Gallus gallus</i>	-
Tuberculosis	<i>Python reticulatus</i>	-	-

Achatina fulica was the only animal species listed in Table 4.17 that was used by both Mah Meri and Temuan. The preparations applied by both tribes, however, differed from one another. The Temuan in Ulu Kuang for example, simply boiled its meat with salt and eaten. The Mah Meri in Sungai Kurau on the other hand, mixed the meat with

ashes prior to boiling. This was done to remove its mucous. The meat was taken orally (Table 4.13).

Although asthma is most probably caused by allergies, Kardrobova *et al.* (as cited in Mahawar & Jaroli, 2008) have reported that asthmatic patients tend to show low selenium level as well. In support of the use of *A. fulica* in treating asthma, Saldanha *et al.* (as cited in Toader-Williams & Golubkina, 2009) have reported that high selenium level was found in the foot of this species. Through the review made by Norton and Hoffman (2012), however, they found the connection between selenium levels and asthma in human were inconclusive to treat or prevent the disease. In addition, the selenium content in natural resources may vary, and may depend on the selenium in the soil itself (Norton & Hoffmann, 2012; Toader-Williams & Golubkina, 2009). *Achatina fulica* has also shown its ability to treat cancer (Dharmu, Ramamurty, Kannan & Babu, 2007). Another snail species i.e. *Pila globosa*, was also used in India to treat asthma. The flesh of this species was cooked and eaten (Jamir & Lal, 2005). This was similar to the preparation applied by the Temuan for *A. fulica*.

Most of the chronic diseases listed in Table 4.17 were treated using *Gallus gallus*. This species was mentioned by the Mah Meri in Sungai Kurau. Using one formulation made from this species, it was used to treat asthma, breathlessness, diabetes and hypertension. The formulation was prepared by charring the legs of *G. gallus* to the bone until it turned to charcoal black and crushed. The ash was decocted using four glasses of water. It was boiled until about three glasses were left. The decoction was drunk three times daily. According to Batin Nengkok anak Mat from Sungai Kurau the species need to be selected based on the patient's gender. For example, if the patient was a woman, the leg from a male jungle fowl was used, and vice versa.

Similar to several plant species in Chapter 4.4.1, the utilization of *Muntiacus muntjak* in Kolam Air for asthma also involved recitation of specific incantation. Its

preparation involves filing the horn of *M. muntjak*. The powdered horn was soaked in lukewarm water for about half to one hour. This infusion needs to be sieved before taken orally since the powdered horn would never dissolve. The incantation was recited before drinking the infusion to increase its efficacy. Nevertheless, the specific incantation was not mentioned by the informant. *Muntiacus muntjak* was also used in Nepal for asthma along with jaundice and pneumonia. However, its liver was used instead (Adhikari & Fischer, 2010). In India and Nepal, *M. muntjak* was used as tonic for cardiac, virility, boost strength; treat gastritis; dysentery; wound, cold; aches and; induce child delivery using its meat, milk, foetus and meat, powdered bone and horn, fat and; leg, respectively (Adhikari & Fischer, 2010; Lohani, 2011; Negi & Palyal, 2007; Padmanabhan & Sujana, 2008). Specific incantation however was not recorded or mentioned in these studies, to treat the diseases and conditions listed.

Although several scientific studies have been made on the species to treat the chronic diseases as listed on Table 4.17, none has been conclusive. Other species meanwhile were left undetermined of its potential. *Scylla* sp. for example posed more threat especially to people who were very sensitive to crustacean or have an allergy towards shellfishes. This condition could cause not only asthma but also anaphylactic shock (Liu *et al.*, 2010). The Mah Meri in Sungai Kurau has taken to char the shell of *Scylla* sp. prior to its infusion in water. The reason was possibly to break down the allergen properties in the shell. The same possibility might lie with the utilization of *Irmengardia pilosimana* in Sungai Bumbun. Although in this case, the meat was cooked and eaten, instead (Appendix 5).

4.5 Natural Resources Utilized for Consumption

For decades, Orang Asli has been known as foragers of the forest. Most often, studies on the Orang Asli would focus primarily on their utilization of natural resources

for food. Living in the fringes or in the jungle has provided them the convenience of gathering the jungle produce available. These resources played a big part in their lives and economy. Many of the informants mentioned that nowadays they have turned to the resources made available in the market. However, some (particularly older villagers) still gather the resources from the wild. This was especially when the resources were in season and abundant. When found in abundance the resources were sold. Seasonal fruiting species were mostly cultivated and harvested during its fruiting season. This activity was vital to them and became one of the main reason for opening a village or settlement e.g. Kolam Air and Songkok Village. During the fruiting seasons, animal species were easily available as they were attracted to the flowers and fruits of the plant species.

Taboos regarding the intake of natural resources not only associated in medicinal or spiritual practice but also in consumption by the Orang Asli. This will be discussed in the subsequent sub-chapters in regards to the category of natural resources of the related species.

4.5.1 Plants

Sums of 163 species of plants from 57 families were used by Orang Asli for consumption. Sixty species of these plants were cultivated (36.8 %) while 97 species were collected in the wild (59.5 %). Another six species of plants (3.7 %) meanwhile were both cultivated and collected in the wild (Table 4.1). Overall, 65 species of plants were used for consumption by the Mah Meri tribe while 132 species of plants by the Temuan tribe.

Manihot esculenta was the most commonly mentioned i.e. in 12 villages (except in Sungai Jang and Songkok Village). This was followed by *Oncosperma tigillarum* and *Diplazium esculentum* in 11 and 10 villages, respectively. *Manihot esculenta* has

been used as one of the main food resource not only by the Orang Asli but also in Malaya even before Japanese occupation. Two parts from this species was consumed by the Orang Asli i.e. its shoot and tuber. Cautious preparation and limited intake, however, should be practiced. This was due to a compound in this species called cyanide. Cyanide was a type of toxic substance which might target the liver (among other organs) in animal species (Soto-Blanco & Górniak, 2010). Additionally, the Jah Hut of Pahang also sold the young leaf of *M. esculenta* as a mean to generate their income with RM 1.00/bundle (Howell, Schwabe & Azizan, 2010).

Oncosperma tigillarum was also eaten by both tribes. Mainly, its palm cabbage (*umbut* or *humbut*) was eaten raw or cooked in dishes. Its ripe fruit meanwhile was eaten raw in Sungai Kurau (Appendix 6). The palm cabbage used in this study would have to be boiled thoroughly prior to consuming or prepared in dishes. The water that was used for boiling was discarded. Failure to do so and excessive consumption could cause diarrhoea, according to Halimah Abdullah from Ulu Kuang. This however, contradicts with the preparation in Broga Village, Hulu Tamu and Sungai Bumbun where it was consumed raw (Appendix 6). In Sungai Judah, the palm cabbage of *O. tigillarum* was used to wrap *Polymesoda expansa*. Both were grilled and eaten. Similarly, the Temuan in Negeri Sembilan also consumed its cooked shoot (Ong, Chua & Pozi, 2011b). Meanwhile, the Murut of Sabah consumed its tip as raw or cooked (Kulip, 2003). Its flower on the other hand, could be used as seasoning added to rice (Bandaranayake, 2002). Apparently, this species was tabooed or prohibited to be consumed by new mothers during the first four days after childbirth (Evans, 1923). However, the reason for this prohibition was not stated.

Diplazium esculentum was one of the species bought by the Orang Asli in the market. This species was mainly cooked and eaten. The young frond was cooked in various dishes including soup, fried, *gulai* and *gulai lemak* with *belacan* (shrimp paste).

Other species of fern consumed by the Orang Asli in this study were *Pleocnemia irregularis* (Plate 4.13) and *Stenochlaena palustris*. Unlike *D. esculentum*, both of these species were collected in the wild. *Pleocnemia irregularis* could easily be found near water bodies. This species was mentioned and consumed mostly by the Temuan tribes i.e. in six villages. *Stenochlaena palustris* meanwhile was consumed mostly among the Mah Meri tribes i.e. in four villages. Only one Temuan village has mentioned the consumption of this species i.e. Tun Abdul Razak. *Stenochlaena palustris* could be found in abundance even at the side of the main road in Carey Island. Similar dishes were prepared by the Orang Asli for all three species of edible ferns. In addition to *D. esculentum*, *P. irregularis* was also cooked with *sambal*, freshwater fish and shrimp; and in coconut milk dish. *Stenochlaena palustris* meanwhile was also cooked with salted fish, in coconut milk dish or as salad (raw or blanched) eaten with the tuber of *M. esculenta* (Appendix 6).



Plate 4.13:
Pleocnemia irregularis (C. Presl) Holttum (Dryopteridaceae) (young frond)

Seventeen different parts of plants were used by the Orang Asli for consumption. The most utilized part was fruit from 77 species. It was followed by shoot from 44 species and leaf from 33 species. Other than for consumption, fruits were also

sold as a source of income among the Orang Asli for years. They have even learned to cultivate several species of fruit trees and planted them in the orchard or the forested areas. Some of the most popularly sold species were *Durio zibethinus*, *Nephelium lappaceum*, *Parkia speciosa* and *Archidendron jiringa*, among other seasonal fruit species. However, according to Norfaizah (2009), only several species were sold in Tun Abdul Razak since there was a lack of demand. She also reported that both *A. bubalinum* and *A. jiringa* were sold at RM 2.00/kg, *D. zibethinus* at RM 50.00/basket, *N. lappaceum* at RM 3.00/100 fruits, *N. mutabile* at RM 5.00/100 fruits and *P. speciosa* at RM 40.00/100 pods. Certain Orang Asli trades the forest products by themselves (at the roadside or market) or through middlemen, such as the Temuan in Bukit Tampoi (Ahmad, 1984). However, some of the Orang Asli e.g. the Temuan in Gombak believed that they should not be selling their fruit crops at the roadside as this action portrayed the act of begging (Rosnah, 1982). Rosnah (1982) mentioned that the specific time of *D. zibethinus* harvesting was between June to August. *Parkia speciosa* and *A. jiringa* meanwhile were harvested during August and September. The bamboo shoots on the other hand during October to November (Rosnah, 1982). In addition to this, several species from the Zingiberaceae family called *tepus* were also collected during their fruiting season. These species were mentioned by informants as having different fruiting season specifically, around October. Eight species of *tepus* were recorded and identified in this study (Appendix 6). According to Batin Salut Undek from Sungai Jang, with the exception of *Alpinia javanica* all *tepus* fruits and flowers were found growing from the ground. Some of the *tepus* species found were e.g. *Amomum conoideum* (Plate 4.14) and *Etlingera littoralis* (Plate 4.15). The fruits of *tepus* were said to have a sweet and delicious taste. However, none of the informants mentioned whether these species were sold. Most of the time, bamboos and rattan were also sold to middlemen when there were demands for them.



Plate 4.14:
Amomum conoideum (Ridl.) Elmer (Zingiberaceae) fruits and single detached fruit (inlet box)



Plate 4.15:
Etlingera littoralis (J. König) Giseke (Zingiberaceae) flower

Artocarpus integer var. *silvestris* or *Pokok bangkung* or *Cempedak hutan* was mentioned in Bukit Lagong and Tun Abdul Razak. Instead of its fruit flesh, its seed was eaten in these villages. Unlike common *cempedak* fruit (*Artocarpus integer*), it has a very thin layer of perianths surrounding the seeds. The seed however, must be cooked thoroughly by boiling or roasting for about one hour or so. Otherwise, it would cause bloating or flatulence. Batin Asu Dollah from Tun Abdul Razak mentioned that its seed could also be used to make chips or *kerepek*. The preparation mentioned by the Temuan

in this study was similar to the Temuan of Kampung Padang, Ulu Langat, Selangor (Ong, 1986). In addition, Batin Salut Undek from Sungai Jang has tried and successfully domesticated this species.

Shoot and leaf were mainly consumed as *ulam* or salad. Bamboo shoots however were often cooked in dishes such as *masak lemak*, *gulai*, fried, *masak air* with the leaf of *E. curtisii*, made into *perkasam* or cooked with fish. Other than *Gigantochloa wrayi*, all bamboo shoots must be boiled first before preparing them in dishes. In Tun Abdul Razak, the shoot of *Dendrocalamus asper* and *G. levis* for example was boiled for two hours and thinly sliced. Afterwards, it was boiled again for a few more minutes (in different water), before preparing it in dishes. This was done to avoid dizziness or *kemabukan*. In Broga Village meanwhile, the shoot of *Schizostachyum gracile* was boiled and the water was discarded. It was mashed before cooking it in dishes.

The plant species used for consumption by the Orang Asli was often used raw with 74 species of plants. This was followed by cooked with 51 species. Meanwhile 42 species of plants were consumed both cooked and raw. The species utilized in raw form were mainly eaten directly (especially for fruit or parts eaten as *ulam*) or used in cooking. Salad or *ulam* was usually taken as a side dish with rice and sometimes accompanied with dips made from chillies called *sambal* or *kentui* (in Tun Abdul Razak).

Seventeen species of plants were used in cooking. Although 12 species of plants were both eaten and used in cooking, five species of plants were used in cooking only. Species used in cooking was added in dishes to bring additional taste such as sourness and spiciness. Such species were *Averrhoa bilimbi*, *Baccaurea lanceolata*, *B. parviflora*, *Cinnamomum zeylanica*, *Citrus aurantifolia*, *Curcuma longa*, *E. curtisii*, *Eleiodoxa conferta*, *Embelia* sp., *Etingera elatior*, *Garcinia nervosa*, *G. urophylla*, *G. xanthochymus*, *Murraya* sp., *Scorodocarpus borneensis*, *Solanum ferox* and *S. torvum*

(Appendix 6). Certain species such as *G. xanthochymus* was also used in removing smells (*hanyir*) in fish preparation, using its shoot.

Elettariopsis curtisii (Plate 4.16) and *S. borneensis* (Plate 4.17) has been widely used (especially among the Temuan) in their dishes. According to the informants, the seed of *S. borneensis* was their version of garlic or *bawang kayu*. The leaf of *E. curtisii* meanwhile was onion. Although in raw form, the leaf of *E. curtisii* has a smell similar to bedbug, it will release a delicious aroma when cooked (in dishes). Ironically, the informant in Gurney Village has mentioned that the leaf of *E. curtisii* was used to rid of bedbug by placing it under the bed. Both *S. borneensis* and *E. curtisii*, however, must be cooked in separate dishes.



Plate 4.16:
Elattariopsis curtisii Baker
(Zingiberaceae)



Plate 4.17:
Scorodocarpus borneensis Becc.
(Olacaceae) seed

Another vital plant species in Orang Asli cooking was *Elateriospermum tapos* (Plate 4.18). It was well known and used especially by the Temuan in this study. Its seed was often made into *erum* and oil for cooking dishes. The preparation of *E. tapos* seed oil involves smoking the seed on cinder for one month. According to Batin Asu

Dollah from Tun Abdul Razak, this was done to rid of its latex. After a month, the oil secreted from the seed was taken and used as cooking oil. Batin Alam Supah from Hulu Tamu mentioned that the seed oil was extracted by pounding and squeezing the seeds. This was probably done after the seed was smoked. He added that *E. tapos* seed oil cooked with the seed of *S. borneensis* should not be consumed excessively since it can cause dizziness. He mentioned that the dizziness was cured with specific incantation (*jampi*).

Erum was probably a type of condiment or spices in the form of pounded *E. tapos* seed. In Tun Abdul Razak, the seed was smoked or dried under the sun until it was thoroughly dried. Afterwards it was pounded and placed in a bamboo. The bamboo and its content were smoked until the content produces oil. The paste formed from the bamboo's content was called *erum*. It was used in numerous of Orang Asli dishes made of shoots, banana's inflorescence, in *gulai* and so on. According to Skeat and Blagden (1906b), the Orang Asli in Perak called it *serum p'rah* meaning "p'rah paste". It was said to be flavourful despite its strong odour. Meanwhile, the Temuan in Ulu Gombak and Ulu Langat; and Orang Asli in Perak pounded the seed either before or after it was fermented (Rosnah, 1982; Skeat & Blagden, 1906b). The Semai of Perak on the other hand, prepared the condiment by boiling and roasting the seed prior to fermenting it for a few weeks (Ong, Lina & Pozi, 2012). Elaborate preparation for *E. tapos* seed was due to its toxic substance called amygdalin in its seed and leaf. This substance could be broken down and reduced by boiling and fermentation (Ngamriabsakul & Kommen, 2009) to ensure its edibility, as applied by the Orang Asli tribes. In addition, the Temuan also ate the fried seed of *E. tapos* (Rosnah, 1982). The Temiar meanwhile used the latex from its unripe seed for cooking (Foo, as cited in Rosnah, 1982). According to Antares (2006) *E. tapos* tree was very sacred and highly cherished by the Temuan. However, it was scarcely found these days.



Plate 4.18:
Elateriospermum tapos Blume (Euphorbiaceae) seed

Hevea brasiliensis seed could also be used as a substitute for *E. tapos* seed oil and *erum*. The same preparation as *E. tapos* was applied for these purposes. Additionally, the shoot of *H. brasiliensis* was eaten raw as salad in Bukit Lagong (Appendix 6). Other than for consumption, this species was also a source of economy for the Orang Asli. In Broga Village for example, the majority of the villagers relies on rubber tapping besides working in government or private sectors.

Plant species were often cooked by the Orang Asli in several types of dishes. This includes frying, *masak air*, *masak lemak*, *gulai*, *gulai air*, *gulai lemak*, *masak kelapa*, soup and; cooked with either the leaf of *E. curtisii*, seed of *S. borneensis*, *E. tapos* or *H. brasiliensis*. Plant species were often fried with anchovies, fishes, chillies and *belacan*. Meanwhile, *masak air* and *gulai air* probably refers to the same method of preparation, which involved cooking the plant species in a soup-like dish. However, this was uncertain. The same unfortunately could be said for *gulai lemak*, *masak lemak* and *masak kelapa*. The differences between these dishes were not explained by the informants. Nevertheless, they might be similar or different with the *gulai* dish prepared by the Malays that used coconut milk as its main ingredient. The general term in English for coconut milk-based dishes was curry even if it does not involve the use of *Murraya* sp. leaf and spices.

Similarity coefficient for the consumed plant species by both tribes calculated using JI resulted 0.21. Similar to previous sub-chapters, this also shows low similarity of plant species use by both Mah Meri and Temuan tribes. These species are listed in Table 4.18, detailing 34 species of plants. Only 17 species of plants were similarly utilized in terms of parts and preparations by both tribes. Out of this number, 13 species were eaten raw while two species were used in cooking i.e. *G. urophylla* and *S. torvum*. Most of the species listed in Table 4.18 are commonly available in the market.

Table 4.19 meanwhile shows the total numbers of edible plant species mentioned in each village. Tun Abdul Razak shows the highest number of plant species with 62 species. This was followed by Broga Village and Sungai Jang with 36 and 30 species of plants, respectively. The lowest number of edible plant species mentioned is in Songkok Village with two species of plants.

Table 4.20 meanwhile shows the numbers of similar plant species consumed between each village in this study. Broga Village – Tun Abdul Razak shows the highest similar number of plant species with 19 species. They were followed by Hulu Tamu – Tun Abdul Razak and Kolam Air – Tun Abdul Razak with 16 species, each. Bukit Lagong – Tun Abdul Razak meanwhile used 15 similar plant species for consumption. All of these villages, however, comprised of the Temuan tribe. Among the Mah Meri villages, the highest number of similar plant species used for consumption was shown between Sungai Bumbun – Kepau Laut and Sungai Judah – Kepau Laut with 11 species, each. Between the Mah Meri and Temuan villages meanwhile, the highest number of similar plant species consumed was shown between Tun Abdul Razak – Sungai Judah with 12 species of plants. They were followed by Tun Abdul Razak – Sungai Bumbun with 10 species of plants; and Kepau Laut – Tun Abdul Razak and Sungai Kurau – Tun Abdul Razak with nine species of plants, each.

Table 4.18: Comparison of similar plant species consumed by both Mah Meri and Temuan tribes

No.	Botanical Name	Part(s) used	Preparation		Village(s)	Mah Meri	Village(s)
			Temuan	Village(s)			
1.	<i>Amaranthus dubius</i> Mart. ex Thellung (Amaranthaceae)	Stem	Fried	TAR	-	-	-
		Leaf	Fried	TAR	Cooked in coconut milk dish	KP	
2.	<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae)	Seed	Cooked and eaten	B	The pod is roasted with charcoal and the seed is eaten	SK	
			Cooked with chillies (<i>sambal</i>)	BL			
			Cooked in coconut milk dish	HT			
			Eaten raw	KA			
			Eaten raw as salad	TAR, UK, BL			
3.	<i>Areca catechu</i> L. (Arecaceae)	Palm cabbage	Cooked in coconut milk dish and eaten	BL	-	-	
			Eaten raw after eating rice	HT	Eaten raw as salad	SB	
			Eaten raw	KA			
			Eaten raw on its own or with <i>Piper betel</i> leaf	TAR			
4.	<i>Artocarpus heterophyllus</i> Lam. (Moraceae)	Ripe fruit	-	-			Eaten raw
		Young fruit	Cooked in coconut dish milk	TAR	-	-	
5.	<i>Carica papaya</i> L. (Caricaceae)	Shoot	Boiled and fried with fish; or eaten as salad	B	Blanched and eaten as salad	KP, SR	
			Boiled and eaten as salad or fried with <i>Elateriospermum tapos</i> seed	TAR	Eaten as salad	SJ, SK	
			Eaten raw as salad	SJG	-	-	
		Young fruit	Cooked <i>gulai air</i> dish with <i>Scorodocarpus borneensis</i> seed and cassava shoot	TAR	-	-	

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
5.	<i>Carica papaya</i> L. (Caricaceae)	Ripe fruit	-	-	Cooked and eaten or eaten raw	SJ
6.	<i>Centella asiatica</i> (L.) Urban (Apiaceae)	Shoot	Eaten raw as salad	BL	Eaten raw as salad	SR
		Whole	-	-	Eaten raw as salad	KP, SK
		Leaf	-	-	Eaten raw as salad	SB, SJ
7.	<i>Cocos nucifera</i> L. (Arecaceae)	Leaf	Cooked with turmeric	BL	Cooked in coconut milk dish or fried	KP
		Palm cabbage	Eaten raw or cooked in coconut milk dish	HT	Fried with anchovies and a little bit of water or boiled	SJ
			Cooked with <i>S. borneensis</i> seed and <i>Elettariopsis curtisii</i> leaf in coconut milk dish	TAR	Boiled and eaten with <i>sambal</i> or cooked in coconut milk dish or soup with fish	SK
		Young coconut juice	Drunk raw	UK	Drunk raw	KP, SB
		Matured coconut meat	-	-	Used in preparing coconut milk and coconut oil	KP
Young coconut meat	-	-	Eaten raw	SB		
8.	<i>Colocasia</i> sp. (Araceae)	Leaf	Eaten as salad	TAR	Fried or cooked in coconut oil dish	SJ
		Stem	Cooked and eaten	TAR	-	-
		Shoot	-	-	Cooked and eaten	SK

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Temuan	Preparation		
				Village(s)	Mah Meri	Village(s)
9.	<i>Cosmos caudatus</i> Kunth (Asteraceae)	Leaf	Eaten raw as salad	B, KA	Blanched and eaten as salad Eaten raw as salad	KP SK
10.	<i>Cucurbita moschata</i> (Duchesne ex Lam.) Duchesne ex Poir (Cucurbitaceae)	Shoot	Fried with <i>tauchu</i> (fermented soybean)	TAR	-	-
		Fruit	-	-	Cooked in coconut milk dish	KP
11.	<i>Curcuma longa</i> L. (Zingiberaceae)	Rhizome	Used as cooking ingredients	B	-	-
		Leaf and rhizome	-	-	Eaten raw as salad with rice	KP
12.	<i>Dendrocalamus asper</i> (Schultes f.) Backer ex Heyne (Poaceae)	Shoot	Used in cooking bivalves	HT	-	-
			Boiled and the water is discarded. The shoot is mashed and cooked	B	Cut into small pieces, boiled and fried	SJ
			Boiled, added in <i>perkasam</i> , in coconut milk dish, fried, <i>masak air</i> with <i>E. curtisii</i> leaf or in coconut milk dish with fish (<i>ikan kembong</i>)	TAR	Cooked with fish or coconut milk	SB
13.	<i>Diplazium esculentum</i> (Retz.) Sw. (Dryopteridaceae)	Young frond	Eaten as salad or cooked e.g. in coconut milk and bird eye chillies dish with cow's stomach	BL		
			Cooked with coconut oil, fried with anchovies or eaten raw as salad	BL	Cooked in coconut milk dish, boiled or fried	KP
			Cooked e.g. fried with chillies	HT	Fried with anchovies	SJ
			Cooked and eaten	B, KA	Cooked in soup or fried	SB

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
13.	<i>Diplazium esculentum</i> (Retz.) Sw. (Dryopteridaceae)	Young frond	Cooked in coconut milk dish with dried shrimp paste sauce (<i>belacan</i>), fried with bamboo young frond and anchovies or in <i>gulai</i> or eaten as salad	TAR	Cooked and eaten	SK
			Cooked with coconut milk, fried with anchovies or eaten as salad	UK		
14.	<i>Donax caniniformis</i> (G. Forst.) K. Schum. (Marantaceae)	Fruit	Ripe fruit is eaten raw	B	Ripe fruit is eaten raw	SB
15.	<i>Eleiodoxa conferta</i> (Griff.) Burret (Arecaceae)	Fruit	Used in <i>sambal</i> preparation	TAR	Cooked with catfish	SB
			-	-	Used in cooking catfish or <i>asam gulai</i> dish	SJ
			Eaten raw	BL	Eaten raw as salad	SB
16.	<i>Garcinia urophylla</i> Scott. ex King (Clusiaceae)	Fruit	Used as <i>asam</i> to add sourness to dish like <i>Garcinia atroviridis</i> (<i>asam keeping</i>)	BL	Used in cooking coconut milk dish	SB
		Leaf	Fried	TAR	Fried	SJ
17.	<i>Ipomea aquatica</i> Forssk. (Convolvulaceae)	Stem	Fried	TAR	-	-
		Tuber	Cooked and eaten	HT	-	-
		Leaf	-	-	Fried or cooked in coconut milk dish	SJ
18.	<i>Ipomea batatas</i> (L.) Lam. (Convolvulaceae)	Shoot	-	-	Cooked and eaten	SK

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
19.	<i>Luffa acutangula</i> (L.) Roxb. (Cucurbitaceae)	Shoot	Fried with <i>tauchu</i>	TAR	-	-
		Fruit	-	-	Cooked in coconut milk dish	KP
20.	<i>Manihot esculenta</i> Crantz (Euphorbiaceae)	Tuber	Boiled	B, BL, KA, UK	Boiled	SB, SK, SR
			Fried	BL, KA, UK	Fried	SK, SR
			Cooked and eaten	HT		
		Shoot	Boiled	BL	Boiled	SB, KP
			Eaten raw as salad	B, BL, KA, UK	Eaten raw as salad	SB, SR, SK
			Cooked in coconut milk dish or fried	BL, TAR	Cooked in coconut milk dish or fried	KP
21.	<i>Melicope</i> sp. (Rutaceae)	Shoot	Boiled, mashed, cut, fried and mixed with coconut milk	UK	Cooked in coconut milk dish or with anchovies or sardine	SB
			Cooked (<i>masak air</i>)	G	Boiled and eaten as salad with <i>sambal</i>	SJ
			Cooked and eaten	HT		
22.	<i>Molineria latifolia</i> (Dryand. ex W. T. Aiton) Herb. ex Kurz (Hydroxylaceae)	Fruit	Blanched and eaten as salad, cooked with <i>E. tapos</i> seed oil, <i>erum</i> or with <i>Hevea brasiliensis</i> seed oil	TAR	Cooked and eaten	SK
			Eaten raw as salad	BL	Boiled and eaten as salad	SJ

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
23.	<i>Musa acuminata</i> Colla (Musaceae)	Inflorescence	Cooked or eaten raw	UK	Fried	SJ
		Pith	-	-	Fried	SJ
24.	<i>Musa balbisaniana</i> Colla (Musaceae)	Inflorescence	Cooked in coconut milk dish or eaten raw as salad	B	Eaten cooked and eaten as salad, cooked with coconut milk or with anchovies	SB
			Cooked and eaten	HT		
			Eaten as salad, fried with dried shrimp paste, cooked in coconut milk dish, in curry, with <i>S. borneensis</i> seed, <i>erum</i> or cooked with its pith and <i>sambal</i> , in coconut milk dish or eaten as salad	TAR		
			Cooked in coconut milk dish, with its inflorescence and <i>sambal</i> , in coconut milk dish or eaten as salad	TAR		
25.	<i>Oenanthe javanica</i> (Blume) DC. (Apiaceae)	Shoot	Eaten raw as salad	SJG	-	-
		Leaf	Cooked or eaten raw	UK	-	-
			-	-	Eaten raw as salad	SK
26.	<i>Oncosperma tigillarum</i> (Jack) Ridl. (Areaceae)	Palm cabbage	Eaten raw, cooked in coconut milk dish or anchovies or fried	B	Cooked in coconut milk dish or fried	KP
			Cooked in turmeric dish or fried	BL	Eaten raw as salad or boiled or fried	SB
			Cooked or eaten raw	HT		
			Eaten raw	KA		
			Cooked and eaten	G		

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
26.	<i>Oncosperma tigillarum</i> (Jack) Ridl. (Arecaceae)	Palm cabbage	Boiled and the water is discarded. It is then cooked with anchovies and <i>E. curtisii</i> leaf in soup or in coconut milk dish	UK	Boiled and eaten with <i>sambal</i> , cooked in coconut milk dish or in soup with fish	SK
		Ripe fruit	-	-	Eaten raw	SJ
27.	<i>Parkia speciosa</i> Hassk. (Fabaceae)	Seed	Used in cooking dishes	SJG	-	-
			Cooked in chillies dish (<i>sambal</i>)	BL		
		Eaten raw as salad	Eaten raw as salad	B, BL, TAR, UK	Cooked or eaten raw	SK
		Cooked or added to <i>asam durian</i> and chillies		B		
28.	<i>Piper betel</i> L. (Piperaceae)	Leaf	Eaten raw with betel nuts (<i>Areca catechu</i>)	B, SJG	Eaten raw with <i>Areca catechu</i> nut	SJ
29.	<i>Piper sarmentosum</i> Roxb. (Piperaceae)	Leaf	Eaten raw as salad	B	Eaten raw as salad	SJ
		Fruit	Eaten raw	B	Eaten raw	KP, SK
30.	<i>Psidium guajava</i> L. (Myrtaceae)	Shoot	-	-	Eaten as salad with rice	SB
31.	<i>Psophocarpus tetragonolobus</i> (L.) DC. (Fabaceae)	Fruit	Eaten raw as salad	TAR	Eaten raw as salad	SK
32.	<i>Solanum tarvum</i> Sw. (Solanaceae)	Fruit	Used in cooking dishes	SJG	Used in cooking dishes	SK
			Eaten as salad or fried with chillies (<i>masak sambal</i>)	Eaten as salad or fried with chillies (<i>masak sambal</i>)	TAR	Eaten raw as salad with anchovies
			Eaten raw as salad		Eaten raw as salad	SK

Table 4.18: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
33.	<i>Stenochlaena palustris</i> (Burm.f.) Bedd. (Blechnaceae)	Young frond	Cooked in <i>gulai</i> or eaten as salad	TAR	Cooked in coconut milk dish, boiled or fried	KP
					Eaten raw as salad, boiled and eaten with <i>Manihot esculenta</i> tuber, cooked in soup or fried	SB
34.	<i>Vitex pubescens</i> Vahl. (Verbenaceae)	Shoot	Eaten raw as salad	BL	Cooked in coconut milk dish	SR
					Eaten raw as salad	SJ

(B: Broga Orang Asli Village; BL: Bukit Lagong Orang Asli Village; G: Gurney Orang Asli Village; HT: Hulu Tamu Orang Asli Village; KA: Kolam Air Orang Asli Village; KP: Kepau Laut Orang Asli Village; KS: Songkok Orang Asli Village; SB: Sungai Bumbun Orang Asli Village; SJ: Sungai Judah Orang Asli Village; SJG: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; SR: Sungai Rambai Orang Asli Village; TAR: Tun Abdul Razak Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

Table 4.19: Numbers of consumed plant species mentioned in each Orang Asli villages

Villages	Total numbers of consumed plant species mentioned
Broga Village (B)	36
Bukit Lagong (BL)	28
Gurney Village (G)	12
Hulu Tamu (HT)	27
Kolam Air (KA)	19
Kepau Laut (KP)	26
Songkok Village (KS)	2
Sungai Bumbun (SB)	24
Sungai Judah (SJ)	28
Sungai Jang (SJG)	30
Sungai Kurau (SK)	22
Sungai Rambai (SR)	11
Tun Abdul Razak (TAR)	62
Ulu Kuang (UK)	25

Table 4.20: Matrix of similar numbers of plant species consumed between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	10	-												
G	7	5	-											
HT	11	8	6	-										
KA	10	6	3	9	-									
KP	7	5	2	5	4	-								
KS	0	0	0	0	1	0	-							
SB	8	8	3	7	8	10	0	-						
SJ	7	8	2	5	4	11	0	11	-					
SJG	10	5	3	6	3	1	0	1	3	-				
SK	8	7	2	6	5	9	0	7	9	4	-			
SR	2	2	1	1	1	6	0	6	8	1	3	-		
TAR	19	15	8	16	16	9	0	10	12	11	10	4	-	
UK	10	9	5	8	7	4	0	4	5	4	7	1	12	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

The numbers in Tables 4.19 and 4.20 were used in calculating JI between the villages in this study. The results are presented in a matrix in Figure 4.10. The highest similarity coefficient was shown between Sungai Bumbun – Sungai Judah with 0.27. It

was followed by Kepau Laut – Sungai Judah and Sungai Rambai – Sungai Judah with 0.26; and Kepau Laut – Sungai Bumbun with 0.25. In contrast to the numbers in Table 4.20, the top three highest similarity coefficients in Figure 4.10 were shown between Mah Meri villages. Overall, low similarity coefficients were observed from the results shown in Figure 4.10.

4.5.2 Mushrooms

Eighteen species of mushrooms from 11 families were utilized by the Orang Asli for consumption (Appendix 7). All of these mushroom species were collected in the wild. Overall, five species of mushrooms were used by the Mah Meri tribe and 17 species of mushrooms by the Temuan tribe.

Schizophyllum commune and *Termitomyces heimii* were commonly used i.e. in 13 villages, each. Both species was not mentioned in Songkok Village. *Auricularia auricula-judae* meanwhile was mentioned in 12 villages while *Lentinus squarrosulus* in nine villages.

Schizophyllum commune was commonly found on dead rubber tree trunk. This species was not sold, as it was just enough to be consumed by one family per collection. This species was usually cooked in soup. At times, onion, anchovies, shallots, garlic and turmeric was also added. Some informants cooked this species in curry, *masak lemak* with cassava shoot, mustard green leaf or *Ipomea aquatica* leaf; turmeric dish, *masak peras* and fried. *Masak peras* was referred in Tun Abdul Razak as coconut milk with bird eye's chillies dish (*masak lemak cili api*). *Schizophyllum commune* was also eaten by other ethnics in Malaysia (Graham & Fauzi, 1991; Lee *et al.*, 2009; Vikineswary *et al.*, 2007). In addition, it was also sold in dried form (Graham & Fauzi, 1991).

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.19	1.00												
G	0.17	0.14	1.00											
HT	0.21	0.17	0.18	1.00										
KA	0.22	0.15	0.11	0.24	1.00									
KP	0.13	0.10	0.06	0.10	0.10	1.00								
KS	0.00	0.00	0.00	0.00	0.05	0.00	1.00							
SB	0.15	0.18	0.09	0.16	0.23	0.25	0.00	1.00						
SJ	0.12	0.17	0.05	0.10	0.09	0.26	0.00	0.27	1.00					
SJG	0.18	0.09	0.08	0.12	0.07	0.02	0.00	0.02	0.05	1.00				
SK	0.16	0.16	0.06	0.14	0.14	0.23	0.00	0.18	0.22	0.08	1.00			
SR	0.04	0.05	0.05	0.03	0.03	0.19	0.00	0.21	0.26	0.03	0.10	1.00		
TAR	0.24	0.20	0.12	0.22	0.25	0.11	0.00	0.13	0.15	0.14	0.14	0.06	1.00	
UK	0.20	0.20	0.16	0.18	0.19	0.09	0.00	0.09	0.10	0.08	0.18	0.03	0.16	1.00

Figure 4.10: Matrix of similarity coefficient of consumed plant species between the villages in this study using Jaccard Index (JI) (data from Tables 4.19 and 4.20) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Termitomyces heimii was a rather well known edible wild mushroom species. The informants in this study described this mushroom as big, white and grew on termite's nest. Thus the vernacular name *cendawan busut* and *petih busut*, which means "termite's nest (or mound) mushroom". Additionally, this species was also called *cendawan guruh* and *petih guruh* meaning, "thunder mushroom". According to the informants, this referred to the factor it grows. The Orang Asli believed that this mushroom would be found growing on termite's nests during rainy season accompanied with thunders (storm). In addition, it was also called *cendawan tahun* ("annual mushroom") among the Temuan tribe as it could be obtained once a year. In India, this species was said to occur around July to September (Harsh *et al.*, 1999). Similar dishes as *S. commune* were also prepared for *T. heimii*. However, it was also cooked in a soup with *Elattariopsis curtisii* leaf and fried with anchovies with *sambal*. According to Batin Asu Dollah from Tun Abdul Razak, this species needs to be cooked thoroughly. Otherwise, it could cause dizziness and salivation. In India, this species was also cooked with mustard or peanut oil along with onions and spices (Harsh *et al.*, 1999). Other species of *Termitomyces* eaten by Orang Asli in this study were *T. clypeatus* (Plate 4.19) and *T. microcarpus* (Plate 4.20) (Appendix 7). According to Ina from Ulu Kuang, people suffering from breathlessness should not consume *T. clypeatus* since it can worsen their condition. She also added that *T. clypeatus* was among the most delicious species of edible wild mushrooms.

Lentinus squarrosulus (Plate 4.21) was mentioned in eight Temuan villages and one Mah Meri village i.e. Kepau Laut. This species was commonly found on dead tree trunk. Only newly grown mushrooms (with soft stipe) were collected. It was usually cooked in soup, coconut milk dish, fried or boiled. The informants in Tun Abdul Razak mentioned that this species did not cause any dizziness upon consuming. However, it only grew in certain months, making it hard to be found in other times. The specific

months that it was usually found however was not mentioned. Additionally, the informant in Ulu Kuang mentioned that this mushroom was called *cendawan sial* (“bad luck mushroom”). According to him, upon encountering this species, no game could be found for the day. Furthermore, Derus and Ina from Ulu Kuang stated that pregnant mothers should not consume this species. They believed that this species could cause the death of the unborn baby, hence the name *cendawan putih mata*. This name was derived from the Malay proverb, *berputih mata* meaning “berhiba hati menanggung rindu” or “heartache from missing someone” (Noresah *et al.*, 2005). In this case, the heartache of pregnant mothers of losing the unborn baby. Besides these two Orang Asli tribes, the Semai, Bateq and Jakun also consumed this species (Lee *et al.*, 2009).



Plate 4.19:
Termitomyces clypeatus R. Heim
(Lyophyllaceae)



Plate 4.20:
Termitomyces microcarpus (Berk. & Broome) R. Heim (Lyophyllaceae)



Plate 4.21:
Lentinus squarrosulus
Mont. (Polyporaceae)

The whole fruiting body of all edible mushroom species were consumed by the Orang Asli in this study. All of these mushroom species were cooked.

Among the mushroom species listed in Appendix 7, *Volvariella volcacea* was mentioned among the Mah Meri villages only. It was known locally as *Cendawan tandan*, *Cendawan kelapa sawit* and *Cendawan tandan kelapa sawit*. These vernacular names indicate the place it grew on i.e. on rotted oil palm cluster. *Hygrocybe conica* and *L. strigosus* meanwhile were mentioned among the Temuan villages only (Appendix 7).

Cautions need to be taken in consuming mushroom species. This was to avoid from consuming poisonous species of mushrooms and a condition called *demam kerabok*. According to Batin Asu Dollah from Tun Abdul Razak, *demam kerabok* referred to “*demam akibat salah makan atau salah campuran makanan*” (fever caused from consuming the ingredients unsuitable for one’s body condition or from consuming wrong mixture of ingredients). He mentioned that this condition was triggered from consuming mushroom species that was cooked with fresh fishes in *gulai* dish. This however excludes anchovies, as it acts as a seasoning in Orang Asli dishes. *Demam kerabok* unfortunately lasted for quite some time (as *demam kepialu* – mentioned in Chapter 4.4.1). Its treatment however, was not mentioned. The word *kerabok* was also used by the Jah Hut to indicate similar triggering condition and symptoms. The Jah Hut also believed in being cautious with their food intake. They did not mix edible resources freely e.g. consumed eggs with eggplant, or mushroom species with meat. They believed these could cause a condition called *Bes punan* that may be fatal (Werner, 1986). The avoidance of consuming mushroom species with meat was also mentioned by Lee *et al.* (as cited in Lee & Chang, 2007) and applied by the Orang Asli in this study (Table 4.21 and Appendix 7).

Table 4.21: Comparison of similar mushroom species consumed by both Mah Meri and Temuan tribes

No.	Mycological Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
1.	<i>Auricularia auricula-judae</i> (Bull.) Quél. (Auriculariaceae)	Whole	Fried, cooked in curry or cooked with anchovies	UK	Boiled or cooked in soup mixed with shallots, garlic, turmeric and anchovies	SB
			Boiled or cooked in soups	SJG	Boiled or cooked in soup	SJ
			Cooked and eaten	G, HT	Cooked and eaten	SK
			Fried, cooked in coconut milk dish with cassava shoot; with vegetables such as mustard green leaf (<i>sawi</i>), <i>Ipomea aquatica</i> leaf; with turmeric; cassava shoot; young corn; <i>Scorodocarpus borneensis</i> seed or in <i>gulai</i>	TAR		
			Cooked in soup, fried with bird eye chillies and anchovies or cooked in coconut milk dish	KA	Cooked in soup or in coconut milk dish	KP
			Cooked with young frond of fern species	B		
			Cooked in soup	BL		
2.	<i>Lentinus squarrosulus</i> Mont. (Polyporaceae)	Whole	Cooked with onion, fried or cooked in soup	B		
			Cooked in soup or fried, or in coconut milk dish	KA		
			Cooked and eaten	BL, G, HT, UK	Boiled or cooked in soup	KP
			Cooked in soup	SJG		
			Cooked in coconut milk with bird chillies eyes or in soup	TAR		

Table 4.21: (continued)

No.	Mycological Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
3.	<i>Schizophyllum commune</i> Fr. (Schizophyllaceae)	Whole	Cooked in soup with onion and anchovies, fried or cooked with coconut	B	Boiled or cooked in soup mixed with shallots, garlic, turmeric and anchovies	SB
			Cooked and eaten	G, HT	Cooked and eaten	SK
			Fried	KA, UK	Fried	SJ
			Cooked in coconut milk with cassava shoot, with vegetables such as mustard green leaf and <i>I. aquatica</i> leaf, in turmeric dish or in coconut milk with bird eyes chillies	TAR	Cooked in coconut milk dish	KP
			Cooked in soup	BL, KA		
			Cooked with coconut oil	BL		
			Cooked with coconut milk dish	BL, KA, SJK, UK	Cooked in soup	SR, KP
			Cooked in curry or cooked with anchovies	UK		
			Cooked in coconut milk dish, in <i>masak peras</i> (coconut milk with bird eye chillies dish), with vegetables such as mustard green leaf and <i>I. aquatica</i> leaf, in turmeric dish or in coconut milk dish with cassava shoot	TAR	Boiled or cooked in soup mixed with shallots, garlic, turmeric and anchovies	SB
			Cooked in coconut milk dish	BL	Cooked in coconut milk dish or boiled	KP
4.	<i>Termitomyces heimii</i> Natarajan (Lyophyllaceae)	Whole	Cooked in soup with <i>Elattariopsis curtisii</i> leaf	UK	Fried with anchovies and <i>sambal</i>	SJ
			Roasted	B		

Table 4.21: (continued)

No.	Mycological Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
4.	<i>Termitomyces heimii</i> Natarajan (Lyophyllaceae)	Whole	Fried	B, BL	Fried	SK
			Boiled or cooked in soup	B, BL, KA, SJG, TAR	Cooked in soup	SR, SJ
			Cooked and eaten	G, HT		

(B: Broga Orang Asli Village; BL: Bukit Lagong Orang Asli Village; G: Gurney Orang Asli Village; HT: Hulu Tamu Orang Asli Village; KA: Kalam Air Orang Asli Village; KP: Kepau Laut Orang Asli Village; KS: Songkok Orang Asli Village; SB: Sungai Bumbun Orang Asli Village; SJ: Sungai Judah Orang Asli Village; SJG: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; SR: Sungai Rambai Orang Asli Village; TAR: Tun Abdul Razak Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

Lignosus rhinocerotis and *Microporus xanthopus* meanwhile were claimed to be edible in Tun Abdul Razak and Bukit Lagong, respectively. These mushrooms' fruiting bodies were cooked and eaten (Appendix 7). However, this information was rather doubtful given the hard structure of their fruiting bodies. Further information was needed to verify the edibility of these mushrooms species and the harm caused (if any) on the individual consuming them.

Similarity coefficient of edible mushroom species between both tribes was calculated using Jaccard Index (JI). The result shows the similarity of 0.22. This reveals low similarity of mushroom species eaten by both Mah Meri and Temuan tribes. The similar mushroom species consumed by both tribes, amounts to four species of mushrooms. They are shown in detail in Table 4.21. Generally, all of these species were either cooked in soup, in coconut milk dish or fried.

The numbers of edible mushroom species mentioned in each Orang Asli village in this study meanwhile is shown in Table 4.22. The highest number was mentioned in Broga Village with 12 species followed by Bukit Lagong with 11 species. Nine species of mushrooms in the meantime were mentioned in both Tun Abdul Razak and Ulu Kuang. On the other hand, no edible mushroom species was mentioned in Songkok Village (Table 4.22).

Table 4.23 shows the numbers of similar mushroom species used between the Orang Asli villages for consumption. The highest number was shown between Broga Village – Bukit Lagong with 10 species (Table 4.23). Meanwhile, between the Mah Meri and Temuan villages, the highest number was shown between Kepau Laut with all Temuan villages, with four species of mushrooms, each. This however excludes Songkok Village (Table 4.23).

The numbers in Tables 4.22 and 4.23 were further used to calculate the similarity coefficient between each Orang Asli village in this study. JI was again used

for this purpose. The results are shown as a matrix in Figure 4.11. Very high similarity could be seen between Gurney Village – Hulu Tamu, Sungai Bumbun – Sungai Judah, Sungai Bumbun – Sungai Kurau and Sungai Judah – Sungai Kurau with 1.00. The lowest similarity coefficient meanwhile was shown between Broga Village – Sungai Rambai with 0.15. The highest similarity coefficient between the Mah Meri and Temuan village were shown between Kepau Laut – Kolam Air and Kepau Laut – Sungai Jang with 0.57.

Table 4.22: Numbers of consumed mushroom species mentioned in each Orang Asli village

Villages	Total numbers of consumed mushroom species mentioned
Broga Village (B)	12
Bukit Lagong (BL)	11
Gurney Village (G)	7
Hulu Tamu (HT)	7
Kolam Air (KA)	6
Kepau Laut (KP)	5
Songkok Village (KS)	0
Sungai Bumbun (SB)	4
Sungai Judah (SJ)	4
Sungai Jang (SJG)	6
Sungai Kurau (SK)	4
Sungai Rambai (SR)	3
Tun Abdul Razak (TAR)	9
Ulu Kuang (UK)	9

Most of the high similarities resulted from JI in Figure 4.11 were shown by the villages belonging to the same tribe. Besides geographical and conditions surrounding the tribes, their respective knowledge of edible mushroom species is a vitally important factor (Lee & Chang, 2007; Lee *et al.*, 2009). This could be seen from the study by Lee and Chang (2007) and Lee *et al.* (2009) on the Temuan, Bateq, Jakun, Che Wong and Semai. These tribes were more reliant on the forest products and have similar

vegetations with each other, in comparison to the Mah Meri and Temuan tribes in this study. However, only several numbers of edible mushroom species were similarly eaten.

Table 4.23: Matrix of similar numbers of mushroom species consumed between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	10	-												
G	7	7	-											
HT	7	7	7	-										
KA	6	6	5	5	-									
KP	4	4	4	4	4	-								
KS	0	0	0	0	0	0	-							
SB	3	3	3	3	3	4	0	-						
SJ	3	3	3	3	3	4	0	4	-					
SJG	6	6	6	6	5	4	0	3	3	-				
SK	3	3	3	3	3	4	0	4	4	3	-			
SR	2	2	2	2	2	3	0	3	3	2	3	-		
TAR	7	7	7	7	5	4	0	3	3	6	3	2	-	
UK	7	7	6	6	6	4	0	3	3	6	3	2	6	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

Edible species by one tribe might be poisonous to another tribe (Lee & Chang, 2007; Lee *et al.*, 2009). Likewise, not all of the well-known edible mushroom species in Malaysia were consumed by the Orang Asli in this study. For example, according to the informants, some of the species listed in the *Common edible mushrooms of Orang Asli communities in Peninsular Malaysia* by Lee, Chang and Noraswati (2006) were not eaten. Other informants meanwhile said that some of the species were inedible or *tak boleh makan*.

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.77	1.00												
G	0.58	0.64	1.00											
HT	0.58	0.64	1.00	1.00										
KA	0.50	0.55	0.63	0.63	1.00									
KP	0.31	0.33	0.50	0.50	0.57	1.00								
KS	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
SB	0.23	0.25	0.38	0.38	0.43	0.80	0.00	1.00						
SJ	0.23	0.25	0.38	0.38	0.43	0.80	0.00	1.00	1.00					
SJG	0.50	0.55	0.86	0.86	0.71	0.57	0.00	0.43	0.43	1.00				
SK	0.23	0.25	0.38	0.38	0.43	0.80	0.00	1.00	1.00	0.43	1.00			
SR	0.15	0.17	0.25	0.25	0.29	0.60	0.00	0.75	0.75	0.29	0.75	1.00		
TAR	0.50	0.54	0.78	0.78	0.50	0.40	0.00	0.30	0.30	0.67	0.30	0.20	1.00	
UK	0.50	0.54	0.60	0.60	0.67	0.40	0.00	0.30	0.30	0.67	0.30	0.20	0.50	1.00

Figure 4.11: Matrix of similarity coefficient of consumed mushroom species between the villages in this study using Jaccard Index (JI) (data from Tables 4.22 and 4.23) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

The consumption of inedible or poisonous mushroom species often shows symptoms that include vomiting and dizziness. The person who consumed these species was said unable to even sitting up due to frequent vomiting. Derus from Ulu Kuang mentioned that these symptoms could be cured using incantation or *jampi*. Afterwards, it usually took around one to two hours for the patient to heal completely. The Orang Asli was very wary when it came to edible mushroom species. This was due to their concerned over the effect of inedible or poisonous mushrooms on their health and lives. Thus, according to Derus and Ina from Ulu Kuang, only selected mushrooms species were consumed. They added that if the edibility of the mushroom species were unknown, they would rather not consume it unless the species was first proven as edible by others.

Apart from that, one mushroom species was very wary by Temuan informants. This mushroom species was called *cendawan mata helang*. This species has been mentioned by several informants in several villages in this study. The informants mentioned that the spores could cause damage to skin when it came in contact. While others said that, this species could cause damage to the feet when stepped on. This species however was not consumed, used medicinally or spiritually by the Orang Asli. Unfortunately, only these small details were given by the informants. Since this species was not encountered during this study, no identification of the species could be made.

4.5.3 Animals

Sums of 211 species of animals from 101 families were used for consumption by the Orang Asli in Selangor (Appendix 8). Among them, 205 species of animals were caught from the wild and six species of animals were reared. The Mah Meri mentioned 90 species of animals for consumption while the Temuan mentioned 170 species of animals.

Two species of animals were dominantly used and mentioned among the villages in this study. These species were *Gallus domesticus* and *Tragulus javanicus*. Both species were mentioned in 11 villages. They were followed by *Bos taurus* and *Hystrix brachyura* in 10 and nine villages, respectively. Both *G. domesticus* and *B. taurus* were bought from the market or trucks selling market goods. According to some informants, however, they rarely consumed the meat of *B. taurus*. This could possibly be due to the price rather than availability or belief against consuming this species. Some villages such as Tun Abdul Razak and Ulu Kuang meanwhile were involved in projects of rearing *B. taurus*.

Hystrix brachyura and *T. javanicus* meanwhile were obtained by trapping these species in the wild. Trapping however require time, patience, luck and availability of the species, according to Man anak Alam from Ulu Kuang. Evans (1923) on the other hand mentioned that *T. javanicus* and the species from Cervidae such as *Cervus unicolor* and *Muntiacus muntjak* were tabooed for women and children. They were believed to cause convulsions and sickness to these groups of people. No taboos however have been mentioned for *H. brachyura*. According to Batin Alam Supah from Hulu Tamu, *H. brachyura* could be found in abundance during the fruiting season of *Mangifera foetida* (*macang*) as it was attracted to the smell of the ripe fruit.

In terms of the animal part(s) consumed, the Orang Asli ate three parts of animal in total i.e. meat, egg and honey. The meat of several animal species might cause some effect to an individual. For example, the consumption of *Panthera tigris*' meat was believed to cause arguments and fights between spouses, according to Batin Alam Supah from Hulu Tamu. He added that the meat was able to raise one's body temperature. Additionally, he mentioned that the meat of *P. tigris* has a rough texture and a certain smell. Envis Gibboi from Tun Abdul Razak meanwhile mentioned that the meat of *Prebystis melalophos* was not often eaten, as it was believed as "*panas*". This

could trigger a condition called *demam sampu* (discussed in Chapter 4.6.1). Prohibition of *P. melalophos* meat however was practiced for individual suffering from hypertension. The meat perhaps has the effect in raising the individual's blood pressure. The Cercopithecidae was also used by the Orang Asli in perceiving whether a natural resource was edible. Its edibility was confirmed if the Cercopithecidae or monkey was alive after consuming the species. If not, they would keep away from it. Rajmah (1971) meanwhile mentioned that no restrictions towards edible natural resources was practiced in Tun Abdul Razak.

There were two ways of preparing animal species for consumption by Orang Asli i.e. cooked and raw. The main cooking methods in preparing animal species include boiling, roasting, frying and grilling. Unlike mushroom species, various dishes were prepared using animal species (especially meat). This includes coconut milk dish, curry, soup, soy sauce, *rendang*, *masak air*, *gulai*, *gulai lemak* or cooked with *Elattariopsis curtisii* leaf, *Scorodocarpus borneensis* seed, vegetables, *erum*, *asam*, chillies and *tempoyak* (i.e. fermented *Durio zibethinus* fruit flesh). *Rendang* was also known as “curry” in English language.

Among the animal species, *Manis javanica* may not be the easiest animal species to be prepared in cooking. According to Senyum Taha, Manah Kadi and Rini Tumi from Hulu Tamu, the pangolin was first *longkoh* (scaled). It was later slightly parched to rid of *bulu mak* (hairs) or singed the hairs. Then, it was boiled in hot water prior to cooking it in dishes.

Two species of animals were consumed raw by the Orang Asli i.e. *Apis* sp. and *Rhynchophorus ferrugineus*. Other than its honey, the meat of *Apis* sp. was also eaten raw with roasted *M. esculenta* tubers and sugar in Sungai Bumbun. For *R. ferrugineus* meanwhile, it was eaten raw or roasted in Sungai Bumbun. According to several informants, the meat of this species has a similar taste to milk. It was commonly found

inside of *Arenga obtusifolia*, *Cocos nucifera* and *Oncosperma tigillarum* tree. Other than that, several species of fish was made into salted fish. This was common among the Mah Meri as it was sold to generate their income. Among the Temuan villages, only one species of fish was prepared into salted fish i.e. *Cynoglossus* sp. in Bukit Lagong (Appendix 8). Similar to mushroom species, all animal species in this category was solely eaten by the Orang Asli (Appendix 8).

Similarity coefficient of edible animal species between the Mah Meri and the Temuan tribes were calculated using Jaccard Index (JI). The result shows the similarity of 0.23. This number was slightly higher than the results from the previous sub-chapters. However, it still indicates low similarity of species mentioned by both tribes.

These animal species are shown and compared in detail in Table 4.24 where 49 species of animals are listed. Among them, only five species were similarly used in terms of their parts and preparation (dishes), by both Mah Meri and Temuan tribes. These species were *B. taurus*, *H. brachyura*, *M. javanica*, *Sundasciurus lowii* and *T. javanicus* (Table 4.24).

Table 4.25 meanwhile shows the total numbers of animal species mentioned in each village in this study that was used for consumption. The highest number was mentioned in Tun Abdul Razak with 92 species. This was followed by Bukit Lagong and Broga Village with 61 and 55 species of animals, respectively. No edible species of animal, however, was mentioned in Songkok Village.

Table 4.26 represent the similar number of animal species eaten between the villages in this study. The highest similarity was shown between Broga Village – Tun Abdul Razak with 30 species. They were followed by Hulu Tamu – Tun Abdul Razak with 27 species. Broga Village – Bukit Lagong, Broga Village – Hulu Tamu and Bukit Lagong – Tun Abdul Razak meanwhile shared 26 species of animals. The lowest similarity was shown between Gurney Village – Sungai Bumbun, Kolam Air – Sungai

Bumbun and Sungai Jang – Sungai Rambai with one species only (Table 4.26). Meanwhile, the highest number of similar animal species eaten by both Mah Meri and Temuan tribes was shown between Sungai Kurau – Tun Abdul Razak with 22 species. They were followed by Broga Village – Sungai Kurau with 18 species. Bukit Lagong – Sungai Kurau and Hulu Tamu – Sungai Kurau meanwhile shared 15 species of animals, each.

The data in Tables 4.25 and 4.26 were used to calculate the similarity coefficient between each village in this study using JI. The results are shown in a matrix in Figure 4.12. The highest similarity was shown between Broga Village – Hulu Tamu with 0.38. This was followed by Broga Village – Ulu Kuang with 0.32 and Broga Village – Kolam Air with 0.31. The lowest similarity meanwhile was shown between Kolam Air – Sungai Bumbun with 0.02. Between the Mah Meri and Temuan villages, the highest similarity was shown between Broga Village – Sungai Kurau and Hulu Tamu – Sungai Kurau with 0.24. This was followed by Sungai Kurau – Tun Abdul Razak with 0.20 and Sungai Kurau – Ulu Kuang with 0.19 (Figure 4.12).

From the Table 4.26 and Figure 4.12, high similarity was shown between the villages from the same tribe (especially among the Temuan), rather than between different tribes. The similar animal species eaten by both tribes, however, could be considered as common in the wild in Malaysia. This is especially back in the days and before Carey Island was covered with plantations. Furthermore, most of the wild animal species mentioned by the informants were once eaten by them or their ancestors and not in recent times.

With the decreased number of animal species and Islamisation, several numbers of animal species are not consumed anymore. Thus, the knowledge of edible wild animal species becomes oral information only. Originally, from the time of their ancestors, the Orang Asli was not choosy when it comes to consuming wild animals.

This was as long as the animal species were available and edible (non-poisonous and not against their traditional belief). Except for crows, bird species resembling crows, lizard (that feed on garbage) and poisonous snake, other species were considered as edible. The consumption of monkeys, however, was avoided. According to several informants, it was due to its resemblance to a child, especially after removing all its fur.

Based on the list of animal species consumed by the Orang Asli in this study, the Mah Meri consumed more species in the form of seafood resources, specifically fishes and shellfishes. This was especially due to the main occupation of villagers in Sungai Kurau and partly in Sungai Judah as fishermen. The Temuan meanwhile relies more on the wild animal species and freshwater fishes such as *kelah* and *tengas*.

4.6 Natural Resources Utilized for Spiritual Purpose

Most of the natural resources used for spiritual purpose were related with healing, belief and conditions unexplained by modern medicine. The Orang Asli believed that the sources of maladies come from the disturbance of malicious spirits. In order to rid this, ceremonies involving the use of natural resources and incantations were performed (Adi *et al.*, 2006; Ariffin, 1979; Ayampillay, 1976; Evans, 1923; Mohd Nizam, 2001). The healing ceremonies were often conducted by the medicine men who usually act as an intermediate between spirits and humans (Skeat & Blagden, 1906a). Unlike modern medicine, which examined the whole ailments or conditions, the medicine men from the Jah Hut and Mah Meri tribes focused on the “symptoms – phenomena” that the patients experienced (Werner, 1986). The spiritual knowledge of the medicine men marked the beliefs carried by the Orang Asli.

Table 4.24: Comparison of similar animal species consumed by both Mah Meri and Temuan tribes

No.	Zoological Name	Part(s) used	Temuan	Preparation		
				Village(s)	Mah Meri	Village(s)
1.	<i>Amaurornis phoenicurus</i> Pennant (Rallidae)	Meat	Cooked in coconut milk dish	B	Cooked in curry	KP
			Roasted, fried or cooked with <i>Scorodocarpus borneensis</i> seed	KA	Cooked in soy sauce dish or curry dish	SJ
			Cooked in curry, with <i>S. borneensis</i> seed or with <i>erum</i>	TAR	Cooked and eaten	SK, SR
2.	<i>Anas</i> sp. (Anatidae)	Meat	Cooked and eaten	B	Cooked and eaten	KP, SJ
3.	<i>Anser cygnoides</i> L. (Anatidae)	Meat	Cooked and eaten	B	Cooked and eaten	SJ
4.	<i>Atherurus macrourus</i> L. (Hystricidae)	Meat	Cooked with <i>Elattertiopsis curtisii</i> leaf	B, BL	Cooked in curry or <i>rendang</i> dish	KP
			Cooked in curry, with <i>S. borneensis</i> seed, with <i>erum</i> or in soup	TAR		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA	Cooked in curry	SJ
			Cooked and eaten	HT		
5.	<i>Bos taurus</i> L. (Bovidae)	Meat	Cooked in curry or <i>rendang</i> dish	TAR	Cooked in curry or <i>rendang</i> dish	KP
			Cooked and eaten	B, G, HT, UK	Cooked and eaten	SJ, SK, SR
			Cooked in soup (<i>masak air</i>)	BL		
6.	<i>Callosciurus caniceps</i> Gray (Sciuridae)	Meat	Cooked and eaten	B	Fried and eaten	SK
7.	<i>Callosciurus nigrovittatus</i> Horsfield (Sciuridae)	Meat	Fried	TAR	Cooked in curry or <i>rendang</i> dish	KP

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
8.	<i>Callosciurus notatus</i> Boddaert (Sciuridae)	Meat	Cooked and eaten	G, HT, UK	Cooked and eaten	SK
			Cooked with <i>E. curtisii</i> leaf	B		
			Cooked in curry, with <i>S. borneensis</i> seed, <i>erum</i> ; or fried	TAR		
9.	<i>Callosciurus prevostii</i> Desmarest (Sciuridae)	Meat	Cooked with <i>E. curtisii</i> leaf	B, BL	Cooked in curry or <i>rendang</i> dish	KP
			Cooked in soup	BL		
			Cooked in curry, with <i>S. borneensis</i> seed, <i>erum</i> ; or in soup	TAR		
10.	<i>Capra hircus</i> L. (Bovidae)	Meat	Cooked and eaten	UK	Cooked and eaten	SJ, SR
			Cooked in soup (<i>masak air</i>)	BL		
11.	<i>Cervus unicolor</i> Kerr. (Cervidae)	Meat	Cooked and eaten	HT	Cooked in curry or <i>rendang</i> dish	KP
			Cooked and eaten	B, BL, HT		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
12.	<i>Chalcophaps indica</i> L. (Columbidae)	Meat	Cooked in curry and soup	TAR	Cooked and eaten	SJ, SK
			Cooked and eaten	BL		
13.	<i>Channa striata</i> Bloch (Channidae)	Meat	Cooked and eaten	SJG	Cooked in curry	KP
			Cooked in coconut milk with bird eye chillies dish	TAR		
14.	<i>Coturnix coturnix</i> L. (Phasianidae)	Meat	Cooked and eaten	TAR	Cooked and eaten	SK
			Cooked with <i>S. borneensis</i> seed or fried	TAR		
15.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Meat	Cooked and eaten	BL, G, UK	Cooked and eaten	SJ

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Temuan	Preparation		
				Village(s)	Mah Meri	Village(s)
16.	<i>Dendrocygna javanica</i> Horsfield (Anatidae)	Meat	Cooked and eaten The meat is cooked in curry, with <i>S. borneensis</i> seed or with <i>erum</i>	BL	Cooked and eaten	SK
				TAR		
17.	<i>Gallus domesticus</i> Höns (Phasianidae)	Meat	Cooked in curry, soy sauce dish or fried Cooked in soup (<i>masak air</i>) Cooked and eaten	TAR	Cooked and eaten	KP, SJ, SK, SR
				BL		
				B, G, KA, S, J, G, UK		
18.	<i>Gallus gallus</i> L. (Phasianidae)	Meat	Cooked and eaten Cooked with <i>E. curtisii</i> leaf	B, KA	Cooked and eaten	SJ
				BL		
19.	<i>Geopelia striata</i> L. (Columbidae)	Meat	Cooked in curry, with <i>S. borneensis</i> seed or with <i>erum</i>	TAR	Cooked and eaten	SK
				-		
20.	<i>Gracula religiosa</i> L. (Sturnidae)	Meat	Cooked in curry, with <i>S. borneensis</i> seed or with <i>erum</i>	TAR	Cooked and eaten	SK
				-		
21.	<i>Helarctos malayanus</i> Raffles (Ursidae)	Meat	Cooked with <i>E. curtisii</i> leaf Cooked and eaten	B	Cooked in curry or <i>rendang</i> dish	KP
				HT		
22.	<i>Hystrix brachyura</i> L. (Hystricidae)	Meat	Cooked with <i>E. curtisii</i> leaf Cooked in curry or <i>gulai</i> Cooked in coconut milk dish, curry dish or with <i>E. curtisii</i> leaf Cooked in curry, with <i>S. borneensis</i> seed, <i>erum</i> ; or in soup	B, HT	The quills are removed and the meat is cooked Cooked in curry dish	SB
				UK, HT		
				BL		
				TAR		

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Temuan	Preparation		
				Village(s)	Mah Meri	Village(s)
22.	<i>Hystrix brachyura</i> L. (Hystriidae)	Meat	Roasted, fried, cooked with <i>S. borneensis</i> seed or in coconut milk dish	KA	Cooked and eaten	SK
23.	<i>Iomys horsfieldii</i> Waterhouse (Sciuridae)	Meat	Cooked with <i>E. curtisii</i> leaf	B	Cooked in curry or <i>rendang</i> dish	KP
			Cooked in curry and soup or fried	TAR		
24.	<i>Loriculus galgulus</i> L. (Psittacidae)	Meat	Cooked and eaten	BL, HT, UK	Cooked and eaten	SK
			Cooked in curry and soup	TAR		
25.	<i>Macaca fascicularis</i> Raffles (Cercopithecidae)	Meat	Cooked and eaten	BL, G, HT, SJK	Cooked and eaten	SK
			Cooked with <i>E. curtisii</i> leaf	B		
			Cooked in curry, with <i>S. borneensis</i> seed, <i>erum</i> ; or in soup	TAR		
			Boiled and cooked with <i>E. curtisii</i> leaf, <i>asam</i> and chillies	UK		
26.	<i>Macaca nemestrina</i> L. (Cercopithecidae)	Meat	Cooked and eaten	BL, G, HT	Cooked and eaten	SB
			Cooked with <i>E. curtisii</i> leaf	B		
			Cooked in <i>gulai air</i> with <i>S. borneensis</i> seed, cooked in curry or in soup	TAR		
27.	<i>Manis javanica</i> Desmarest (Manidae)	Meat	Boiled and cooked with <i>E. curtisii</i> leaf, <i>asam</i> , and chillies	UK	Cooked and eaten	SB, SK
			Cooked with <i>E. curtisii</i> leaf	B		
			Cooked in curry and eaten	TAR		
			Cooked and eaten	HT, UK	Cooked in curry	SJ

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
28.	<i>Muntiacus muntjak</i> Zimmermann (Cervidae)	Meat	Cooked with <i>E. curtisii</i> leaf	B, BL	Cooked and eaten	SJ
			Cooked in curry and soup	TAR		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
			Cooked and eaten	G, HT		
29.	<i>Naemorhedus sumatraensis</i> Bechstein (Bovidae)	Meat	Cooked with <i>E. curtisii</i> leaf	B	Cooked and eaten	SK
			Cooked in curry and soup	TAR		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
			Cooked and eaten	HT		
30.	<i>Nycticebus coucang</i> Boddaert (Lorisidae)	Meat	Cooked with <i>E. curtisii</i> leaf	B	Cooked and eaten	SK
			Cooked and eaten	HT, TAR		
31.	<i>Paguma larvata</i> C. E. H. Smith (Viverridae)	Meat	Cooked in curry, with <i>S. borneensis</i> leaf or with <i>erum</i>	TAR	Cooked in curry or <i>rendang</i> dish	KP
32.	<i>Panthera tigris</i> L. (Felidae)	Meat	Cooked and eaten	BL, HT	Cooked and eaten	KP
			Cooked and eaten	BL, HT, UK	Cooked in curry or <i>rendang</i> dish	KP
33.	<i>Paradoxurus hermaphroditus</i> Pallas (Viverridae)	Meat	Cooked and eaten	BL, G	Cooked and eaten	SK, SR
			Cooked and eaten	B	Cooked in curry or <i>rendang</i> dish	KP
34.	<i>Prebystis</i> sp. (Cercopithecidae)	Meat	Cooked with <i>E. curtisii</i> leaf or fried	BL, HT	Cooked and eaten	SK
35.	<i>Pteropus vampyrus</i> L. (Pteropodidae)	Meat	Cooked and eaten	TAR	Cooked and eaten	SK
			Roasted, cooked in <i>gulai</i> or with vegetables		Cooked and eaten	SK

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	
36.	<i>Pycnonotus goiavier</i> Scopoli (Pycnonotidae)	Meat	Cooked and eaten	B	Cooked and eaten	SK
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
			Cooked in curry and soup	TAR		
37.	<i>Python reticulatus</i> Schneider (Boidae)	Meat	Cooked and eaten	B, BL, G, UK, HT	Cooked and eaten	KP, SK
38.	<i>Rhizomys sumatrensis</i> Raffles (Muridae)	Meat	Cooked with <i>E. curtisii</i> leaf	B	Cooked and eaten	SK
			Cooked in curry, with <i>S. borneensis</i> leaf, <i>erum</i> ; in soup or fried	TAR		
			Cooked and eaten	HT, BL		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
39.	<i>Rhynchophorus ferrugineus</i> Olivier (Curculionidae)	Meat	-	-	Eaten raw or roasted	SB
		Whole	Cooked and eaten	BL	-	-
40.	<i>Streptopelia chinensis</i> Scopoli (Columbidae)	Meat	Cooked in curry, with <i>S. borneensis</i> seed or with <i>erum</i>	TAR	Cooked and eaten	SK
41.	<i>Sundasciurus lowii</i> Thomas (Scuridae)	Meat	Fried	TAR	Cooked in curry or <i>rendang</i> dish	KP
			Cooked and eaten	BL, HT, UK	Cooked in curry or fried	SJ
42.	<i>Sus scrofa</i> L. (Suidae)	Meat	Fried	KA	Cooked and eaten	SK
			Cooked with <i>E. curtisii</i> leaf	B		
			Cooked in curry, fried with soy sauce or cooked with <i>S. borneensis</i> seed	TAR		

Table 4.24: (continued)

No.	Scientific Name	Part(s) used	Preparation			
			Temuan	Village(s)	Mah Meri	Village(s)
43.	<i>Tamiops macclellandii</i> Horsfield (Scuriidae)	Meat	Cooked and eaten	UK	Cooked and eaten	KP
			Cooked with <i>E. curtisii</i> leaf	B, BL	Cooked in curry	KP
44.	<i>Tragulus javanicus</i> Osbeck (Tragulidae)	Meat	Roasted, fried or cooked with <i>S. borneensis</i> seed	KA	Cooked and eaten	SJ, SK
			Cooked in curry	BL, TAR, SJK		
			Grilled	SJK		
			Cooked in coconut milk dish or soup	TAR		
			Cooked and eaten	HT,G, UK		
45.	<i>Tragulus napu</i> Cuvier (Tragulidae)	Meat	Cooked and eaten	B, HT, UK	Cooked and eaten	SJ, SK
			Cooked with <i>E. curtisii</i> leaf	BL		
			Roasted, fried or cooked with <i>S. borneensis</i> seed	KA		
			Cooked in curry and soup	TAR		
46.	<i>Treron</i> sp. (Columbidae)	Meat	Cooked and eaten	BL, TAR	Cooked in curry	SJ
47.	<i>Turnix suscitator</i> Gmelin (Turnicidae)	Meat	Cooked and eaten	BL, KA	Cooked and eaten	KP
48.	<i>Varanus salvator</i> Laurenti (Varanidae)	Meat	Cooked and eaten	UK	Cooked and eaten	SK
49.	<i>Varanus</i> sp. (Varanidae)	Meat	Cooked and eaten	SJK	Cooked and eaten	KP, SK

(B: Broga Orang Asli Village; BL: Bukit Lagong Orang Asli Village; G: Gurney Orang Asli Village; HT: Hulu Tamu Orang Asli Village; KA: Kolam Air Orang Asli Village; KP: Kepau Laut Orang Asli Village; KS: Songkok Orang Asli Village; SB: Sungai Bumbun Orang Asli Village; SJ: Sungai Judah Orang Asli Village; SJK: Sungai Jang Orang Asli Village; SK: Sungai Kurau Orang Asli Village; SR: Sungai Rambai Orang Asli Village; TAR: Tun Abdul Razak Orang Asli Village; UK: Ulu Kuang Orang Asli Village)

Table 4.25: Numbers of consumed animal species mentioned in each Orang Asli village

Villages	Total numbers of consumed animal species mentioned
Broga Village (B)	55
Bukit Lagong (BL)	61
Gurney Village (G)	19
Hulu Tamu (HT)	39
Kolam Air (KA)	34
Kepau Laut (KP)	32
Songkok Village (KS)	0
Sungai Bumbun (SB)	12
Sungai Judah (SJ)	47
Sungai Jang (SJG)	9
Sungai Kurau (SK)	37
Sungai Rambai (SR)	5
Tun Abdul Razak (TAR)	92
Ulu Kuang (UK)	36

Table 4.26: Matrix of similar numbers of animal species consumed between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	26	-												
G	11	13	-											
HT	26	22	10	-										
KA	21	19	5	15	-									
KP	13	14	4	10	7	-								
KS	0	0	0	0	0	0	-							
SB	3	3	1	3	1	3	0	-						
SJ	13	12	5	9	9	13	0	3	-					
SJG	5	4	5	4	3	3	0	0	2	-				
SK	18	15	7	15	11	13	0	4	12	5	-			
SR	3	4	3	2	3	3	0	0	4	1	4	-		
TAR	30	26	11	27	24	13	0	3	12	12	22	3	-	
UK	22	20	10	16	10	8	0	3	7	5	12	2	19	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.29	1.00												
G	0.17	0.19	1.00											
HT	0.38	0.28	0.21	1.00										
KA	0.31	0.25	0.10	0.26	1.00									
KP	0.18	0.18	0.09	0.16	0.12	1.00								
KS	0.00	0.00	0.00	0.00	0.00	0.00	1.00							
SB	0.05	0.04	0.03	0.06	0.02	0.07	0.00	1.00						
SJ	0.15	0.13	0.08	0.12	0.13	0.20	0.00	0.05	1.00					
SJG	0.08	0.06	0.22	0.09	0.08	0.08	0.00	0.00	0.04	1.00				
SK	0.24	0.18	0.14	0.25	0.18	0.23	0.00	0.09	0.17	0.12	1.00			
SR	0.05	0.06	0.14	0.05	0.08	0.09	0.00	0.00	0.08	0.08	0.11	1.00		
TAR	0.26	0.20	0.11	0.26	0.24	0.12	0.00	0.03	0.09	0.13	0.21	0.03	1.00	
UK	0.32	0.26	0.22	0.27	0.17	0.13	0.00	0.07	0.09	0.13	0.20	0.05	0.17	1.00

Figure 4.12: Matrix of similarity coefficient of consumed animal species between the villages in this study using Jaccard Index (JI) (data from Tables 4.25 and 4.26) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

4.6.1 Plants

Fourteen species of plants from 11 families were used by the Orang Asli in this study for spiritual purpose (Appendix 9). Six of these species were cultivated, seven were collected from the wild and one species was both cultivated and obtained from the wild (Table 4.1 and Appendix 9). Among the species listed in Appendix 9, five species were utilized by the Mah Meri tribe while nine species by the Temuan tribe. *Cheilocostus speciosus* was the only plant species that was used in more than one village i.e. in Bukit Lagong, Sungai Jang and Tun Abdul Razak (Appendix 9). This species was used to treat *santau*, *demam sampu* and as one of the materials in healing ceremonies. *Santau* refers to a type of deadly poison. It was sometimes coupled with magical incantations and used with malicious intent on a person (Amran, 1991; Hawkins, 2008). This condition was treated in Bukit Lagong using either the root or shoot of *C. speciosus*. The former was decocted and drunk whilst the latter was eaten raw (Appendix 9).

Demam sampu meanwhile was a condition believed as the cause of an action meant to be taken but failed to do so. For example, if one person felt that he or she needed to eat rice before heading out but failed to do so, then he or she will suffer from *demam sampu*. In Tun Abdul Razak this condition was treated by patching the grated of whole *C. speciosus* to the patient's head. According to the informants, it cannot be treated using modern medicine. Furthermore, it needed specific incantation or chants recited along with the application of the species. *Demam sampu* might be related with *kempunan* or "longing", commonly towards certain types of food. The Orang Asli believed that something bad would happened if the longing was left unfulfilled (Carey, 1968; Skeat & Blagden, 1906b). This was similarly mentioned by the Temuan in Genting Peras and Kuala Pangson Orang Asli Village (Norwahidah, 1998). Gimlette and Thomson (1971) meanwhile stated that *sampu* refers to tuberculosis while *demam*

sampu as “fever with teething”. This symptom of *demam sampu* might be the result from eating the meat of *Prebystis melalophos* rather than longing, as the effect of its meat (in Chapter 4.5.3). Due to the lack of information given regarding the symptoms suffered by the patients, several possibilities of this condition could be deduced. One, there might be more than one type of *demam sampu* known to the Orang Asli. Another was the possibility of this ailment bearing similar symptoms despite being triggered by different conditions.

Leaf and root were the most utilized plant parts for spiritual purpose i.e. from five species, each. This was followed by rhizome from three species of plants and shoot from two species of plants. The roots i.e. from *Bauhinia* sp. and *Scindapsus hederaceus*, were used by the Temuan to keep from hunger. This was very useful during the gathering and collection of forest products (especially medicinal resources). The root of *Bauhinia* sp. was tied around the stomach while the root of *S. hederaceus* was tied around the wrist. Batin Alam Supah from Hulu Tamu mentioned that the use of *Bauhinia* sp. made the travelling in the deep-forested areas easier as the hunger was felt only upon arriving home. Whether *Bauhinia* sp. and *S. hederaceus* could be used together, however, was not mentioned by the informants.

In terms of its utilization, the plant species were mostly mentioned to rid or protect against spiritual disturbance i.e. using six species of plants. Spiritual disturbance in child could be detected from the excessive crying especially late at night. According to informants, this indicates that there was a supernatural existence near the child. Charm was tied around the child’s wrist as a mean of protection from spiritual disturbance. This charm was made from a series of *Acorus calamus* rhizome, *Kaempferia galanga* leaf and *Zingiber montanum* leaf. *Kaempferia galanga* rhizome could also be used alone as a charm for this purpose (Appendix 9).

Citrus aurantifolia meanwhile was used for both dispelling and protection against the disturbance of malicious spirits. The Temuan in Broga Village sprayed the juice from the fruit of this species around the house yard. They believed that it could act as a protective barrier against spiritual disturbance. Additionally, *Acorus calamus* was used in Sungai Judah for the same effect as *C. aurantifolia*. However, unlike *C. aurantifolia*, the leaf of *A. calamus* was dried and burnt in the evening. The smell of its burnt leaf was believed, disliked by the spirit. Thus, dispelling them from the areas and possibly preventing the spirit from coming back.

The Orang Asli also believes that sharp objects were capable of piercing spiritual existence. Thus, they were often hung or placed in front of the house to prevent the spirits from entering. According to the informants in Sungai Bumbun, sharp thorns of *Pandanus* sp. were used for this purpose. Batin Alam Supah from Hulu Tamu meanwhile hung the spiny-rind of *Durio* sp. or *durian hutan* on his doorsill for the same purpose. However, he said that this species was not consumed since the rind could hardly be cracked open. According to Adi *et al.* (2006), *Durian hutan* was used by both Temuan and Mah Meri from evil and *toyol*.

Unlike the plant species listed in this category, *Embelia* sp. was used to treat fever. However, due to its different method application from the other plant species in Chapter 4.4.1 and Appendix 3, it was placed in this category instead. According to Asan Polis from Kolam Air, the newly grown shrub of this species was placed under the patient's pillow to relieve fever. Apparently, the same method of application was also applied by the Temuan in Ulu Gombak and Ulu Langat, albeit using different species i.e. *Allomorpha* sp. or *Bujang semalam* (Rosnah, 1982). The reason behind the selection of this plant's part and application for both species though, were not mentioned. However, the probability may lie on the febrifuge effect contained in these species that was released via aromatherapy and so on.

Xylocarpus moluccensis was used as a source of material for woodcrafts by the Mah Meri. This woodcarving was mainly in the form of mask and statues representing *moyang*. Originally, the carving of the *moyang* statue by the Mah Meri was used for worshipping and spiritual healing. It involved a ceremony called *sakkat buang* where the statue was used as a medium in removing ailments (by storing them from patients) (Werner, 1974, 1986). Similar practice was also done by the Jah Hut. Although in their case, it was called *sepili*. Unlike the Mah Meri, the Jah Hut used *Alstonia scholaris*, *Hibiscus macrophyllus* and *Gymnacramthera forbes* as the wood material for *sepili* (Werner, 1974, 1986). Since the woodcrafts have been gaining attention from inside and outside Malaysia, woodcraft centre has been set up in Carey Island. This centre has become one of the tourist spots in Malaysia. The price of the woodcrafts could fetch from a few to hundreds or thousands of ringgit per piece, depending on its size. Thus, the carving of *moyang* not only preserved and introduced their culture but also generating their income at the same time. Other than humanoid form, the spirits carved by the Mah Meri were also represented in animal form, such as *Moyang belalang*, *Moyang belankas*, *Moyang katak kala* and *Harimau berantai* (Ratos, 2006). The spirits that were represented through the carvings were greatly influenced by the environment that surrounds them. Each spirit or *moyang*; and carving has their own folk stories of how the *moyang* came to be and the effects it can have in their lives. However, unlike the Jah Hut, only a handful of the Mah Meri still involved in woodcarving. This was due to the younger generations' interest in wage labour or working in the government or private sectors (Ratos, 2006). Furthermore, the species *Xylocarpus* have been declining in numbers. Hardly any initiatives has been done in order to restore or re-plant this species, even by the Orang Asli (Ratos, 2006).

Due to the absence of similar plant species used by both tribes in this category, the similarity coefficient was not calculated. The numbers of plant species mentioned

for spiritual purpose in each village, however, is shown in Table 4.27. Only nine Orang Asli villages mentioned the utilization of plant species for spiritual purpose. It was led by Broga Village with four species of plants.

Table 4.27: Numbers of plant species mentioned for spiritual purpose in each Orang Asli village

Villages	Total numbers of plant species mentioned for spiritual purpose
Broga Village (B)	4
Bukit Lagong (BL)	1
Gurney Village (G)	0
Hulu Tamu (HT)	2
Kolam Air (KA)	1
Kepau Laut (KP)	0
Songkok Village (KS)	0
Sungai Bumbun (SB)	2
Sungai Judah (SJ)	2
Sungai Jang (SJG)	2
Sungai Kurau (SK)	1
Sungai Rambai (SR)	0
Tun Abdul Razak (TAR)	1
Ulu Kuang (UK)	0

4.6.2 Mushrooms

Only one species of mushroom was used for spiritual purpose i.e. *Amauroderma* sp. The Temuan in Ulu Kuang used this species for babies who cried late at night and convulsion. Although both required the mushroom to be made into necklace, its utilization requires two different parts of the mushroom species. For the baby who cried late at night, the whole mushroom was cut and worn by the infant. Meanwhile for convulsion, only the stipe of the mushroom was used. Spells and chants were recited before the necklace was worn by the patient. Similarly the Temuan in Ulu Serendah, Gurney Village and Hulu Batu Orang Asli Village also wore the stipe of *Amauroderma* sp. as necklace as a prevention of fits (Chang & Lee, 2003). Another method of

preparation regarding the stipe of this species for convulsion was mentioned in Ulu Kuang. According to Ina from Ulu Kuang, the stipe of *Amauroderma* sp. was charred and mixed with a little bit of coconut oil. This mixture was lined near the eyelashes of the child. The vernacular name of this species i.e. *cendawan sawan* might refer to its utilization in treating convulsion. The word *sawan* meant “convulsion” or “fit” or “loss of consciousness” (Gimlette & Thomson, 1971; Hawkins, 2008).

4.6.3 Animals

Eight species of animals from eight families were used by the Orang Asli for spiritual purpose (Appendix 10). All of these species were obtained by the Orang Asli in the wild. Four species of animals were used by the Mah Meri, whilst five species by the Temuan.

The most commonly mentioned species was *Manis javanica* i.e. in four villages followed by *Rhinoplax vigil* in three villages. *Limulus polyphemus* and *Termes* sp. meanwhile were mentioned in two villages. *Manis javanica* was used by the Mah Meri and Temuan tribes mainly as a protection against sun shower. Sun shower was a weather condition when the rain falls during sunny weather or known as *hujan panas*. Orang Asli believed that this weather brought illness along with it (Evans, 1923). During this time, children were prohibited from going out as they might be affected with ailments such as fever and high fever. Thus, protective charm or talisman was often worn as a mean of protection. The scale of *M. javanica* was worn either as a charm or as keychain in Sungai Bumbun and Ulu Kuang. Alternatively, a small part of it was burned in Kolam Air, to serve the same purpose. *Manis javanica* was also used for frequently crying children – possibly from spiritual disturbance. Its scale was charred and the ashes applied all over the child’s face in Sungai Jang (Appendix 10). In

addition, it was also used by both children and adult as a protection against evil spirits and black magic (Burkill, 1966a; Lim, 1981).

Rhinoplax vigil meanwhile was used as poison detector by the Temuan. Its casque was made into a ring (Appendix 10). This ring would break if there were any poison nearby especially in the served food or drinks. Burkill (1966b) meanwhile mentioned that instead of cracked, the ring changed to a livid colour when it comes in contact with poison. Other than ring, the casque could also be made into a button, spoon or brooch for the same purpose (Burkill, 1966b).

Nine parts of animal species were used in this category. Head was the only part that was used from more than one species of animals i.e. *Channa striata* and *Cuora amboinensis*. These heads however were used from live species. *Channa striata* was used by the Temuan for delayed walking in children. *Cuora amboinensis* meanwhile was used by the Mah Meri to treat boil (Appendix 10).

Eight conditions were mentioned in this category. The most commonly mentioned was protection against spiritual disturbance, involving three species of animals (Appendix 10). Similar to the plant species (Chapter 4.6.1), the Mah Meri of Kepau Laut would hung the whole of *Hystrix brachyura* (presumably dead) in front of the house as a protection from diseases from entering their house (Appendix 10). The Semai-Perak meanwhile would hung the head of *C. striata* for the same purpose (Adi *et al.*, 2006). The reason behind this was unknown. Unlike *H. brachyura*, *C. striata* does not have any structure on it that spells as sharp and dangerous. Additionally, *H. brachyura* was also mentioned by an informant as having *batu geliga* or “magic stone” inside its organ. This *batu geliga* apparently was able to treat various ailments and conditions. Unfortunately, he neither specify on how to recognize nor mention certain characteristics which of the porcupine that has the *batu geliga* (Appendix 10). Burkill (1966b) stated that this *batu geliga* was called “bezoar” and its ability to heal ailments

was considered as magic by him. He also mentioned that bezoar could be obtained from certain Cercopithecidae and deer. The bezoar actually consisted of “ellagitannin deposited around a nucleus” as concretions often in stomach (Burkill, 1966b).

Similarity coefficient of animal species used for spiritual purpose by both tribes was calculated using Jaccard Index (JI). The result shows 0.13 of similarity. This shows low similarity of species used between both the Mah Meri and Temuan tribe. Only one species of animals was used by both tribes in this category i.e. *M. javanica* (Appendix 10).

The total numbers of animal species mentioned for spiritual purpose in each village is shown in Table 4.28. The highest number was shown in seven villages i.e. Bukit Lagong, Kolam Air, Kepau Laut, Sungai Bumbun, Sungai Jang, Sungai Kurau and Ulu Kuang, with two species of animals, each. Five villages meanwhile did not mention any animal species used for spiritual purpose (Table 4.28).

Table 4.28: Numbers of animal species mentioned for spiritual purpose in each Orang Asli village

Villages	Total numbers of animal species mentioned for spiritual purpose
Broga Village (B)	1
Bukit Lagong (BL)	2
Gurney Village (G)	0
Hulu Tamu (HT)	0
Kolam Air (KA)	2
Kepau Laut (KP)	2
Songkok Village (KS)	0
Sungai Bumbun (SB)	2
Sungai Judah (SJ)	0
Sungai Jang (SJG)	2
Sungai Kurau (SK)	2
Sungai Rambai (SR)	0
Tun Abdul Razak (TAR)	1
Ulu Kuang (UK)	2

Meanwhile, the similar numbers of species between the villages in this study are shown in Table 4.29. Only five species of animals were used in more than one village in this study namely, *H. brachyura*, *L. polyphemus*, *M. javanica*, *R. vigil* and *Termes* sp. (Appendix 10). The numbers in Tables 4.28 and 4.29 were further used to calculate the similarity coefficient between the villages in this study using JI. The results are shown as a matrix in Figure 4.13. The highest similarity was shown between Broga Village – Sungai Jang with 0.50. They were followed by Bukit Lagong – Kolam Air, Bukit Lagong – Ulu Kuang, Kolam Air – Sungai Bumbun, Kolam Air – Ulu Kuang and Kepau Laut – Sungai Judah with 0.33, each (Figure 4.13). The highest similarity coefficient between the Mah Meri and Temuan village meanwhile was between Kolam Air – Sungai Bumbun with 0.33.

Table 4.29: Matrix of similar numbers of animal species used for spiritual purpose between the Orang Asli villages in this study

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	-													
BL	0	-												
G	0	0	-											
HT	0	0	0	-										
KA	0	1	0	0	-									
KP	0	0	0	0	0	-								
KS	0	0	0	0	0	0	-							
SB	0	0	0	0	1	0	0	-						
SJ	0	0	0	0	0	0	0	0	-					
SJG	1	0	0	0	1	0	0	0	0	-				
SK	0	0	0	0	0	1	0	1	0	0	-			
SR	0	0	0	0	0	0	0	0	0	0	0	-		
TAR	0	0	0	0	0	0	0	0	0	0	0	0	-	
UK	0	1	0	0	1	0	0	0	0	0	0	0	0	-

(refer to List of Abbreviations on page xi for abbreviation of the villages' names)

	B	BL	G	HT	KA	KP	KS	SB	SJ	SJG	SK	SR	TAR	UK
B	1.00													
BL	0.00	1.00												
G	0.00	0.00	1.00											
HT	0.00	0.00	0.00	1.00										
KA	0.00	0.33	0.00	0.00	1.00									
KP	0.00	0.00	0.00	0.00	0.00	1.00								
KS	0.00	0.00	0.00	0.00	0.00	0.00	1.00							
SB	0.00	0.00	0.00	0.00	0.33	0.00	0.00	1.00						
SJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00					
SJG	0.50	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	1.00				
SK	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.00	1.00			
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00		
TAR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
UK	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00

Figure 4.13: Matrix of similarity coefficient of animal species used for spiritual purpose between the villages in this study using Jaccard Index (JI) (data from Tables 4.28 and 4.29) (refer to List of Abbreviations on page xi for abbreviation of the villages' names)

4.7 General Discussion

4.7.1 Natural resources utilized as medicine

The Orang Asli ancestors have done their own trials and error of the natural resources' capabilities to treat ailments and conditions. The species that has been proven effective was applied and continuously passed down the generation. The medicinal knowledge usually involved ailments or conditions that the Orang Asli faced in their lives especially when they dwell in the jungle areas. This includes childbirth and postpartum, wound and injuries, sprained, fracture, ringworm and fever.

Several formulations made from animal species by the Mah Meri involved the addition of coconut oil. Specific type of coconut was used for this purpose, as they believed it would increase the efficacy of the medicine. This coconut was called *kelapa tunggal* or *Cocos nucifera* fruit found growing solitarily from a coconut tree. The term *tunggal* meant "single". The most effective and sought after *kelapa tunggal* for medicine was from trees bearing fruits facing east or sunrise. However, in the absence of *kelapa tunggal*, commonly found coconut fruit could be used as well. Batin Buntal a/l Deraman from Ulu Kuang meanwhile mentioned that the matured coconut juice was more valuable medicinally in comparison to young coconut.

From time to time, the introduction of modern medicine and knowledge from other ethnics was assimilated into the ancestral knowledge of the Mah Meri and Temuan tribes. Some of this knowledge could not be identified its origin especially if it was obtained via hearsay. Through modern medicine, Orang Asli has learned the symptoms and diseases of ailments such as hypertension, diabetes and cancer. These diseases however were relatively new among the Orang Asli. The record by Polunin during the resettlement period in 1953 for example does not list these diseases. In addition, the highest admission cases in JAKOA Hospital in Tunisan (2002) did not include these diseases. Instead, malarial fever, tuberculosis, skin diseases and asthma

were mentioned (Polunin, 1953; Tunisan, 2002). In Pahang, Abdulelah, Zurainee, Hesham and Rohela (2010) had managed to record 19 species of plants in treating malaria among the Orang Asli and rural communities in Lipis. However, in this study only one species of natural resource was recorded in treating malaria i.e. *P. reticulatus* by the Mah Meri (Table 4.13 and Appendix 5). This indicates their reliance towards modern medicine.

The introduction and utilization of modern medicine by the Orang Asli probably started during the Japanese occupation period. This could be seen through the utilization of quinine for malaria and later on during the resettlement period (Noone, 1972). According to Noone (as cited in Polunin, 1953), the Orang Asli believed in the effectiveness of modern medicine. Their reliance towards medicines or drugs was apparent from the utilization of *paracetamol* for slight headache and fever by the villagers in this study. Orang Asli also relied on hospitals or clinics when it comes to childbirth. The villagers of Kolam Air for example would travel to the Sungai Buloh Hospital for this purpose. Traditional method of labour was not practiced anymore. This could be due to the exposure of modern medicine and introduction of safer methods of labour in hospitals than having a traditional midwife attending in their house. Ayampillay (1976) has mentioned that giving birth in hospital appears to be the preferred choice since it cause less pain, cost and complications by the Mah Meri in Tanjung Sepat. In 2002, Tunisan reported that the utilization of modern medicine by the Temuan in Batu 12, Gombak, Selangor amounts to 84 %, whereas traditional medicine a mere 5 %. Both forms of medicines meanwhile show 11 % of utilization.

The traditional medicine has become only part of their memory instead of practice as the result of the introduction to modern medicine. Traditional medicine was often opted when the ailments or conditions could not be treated using modern medicine. The knowledge and service of medicine men would be sought for this

purpose. Each Orang Asli village usually would have at least one medicine man. The knowledge possessed especially by the medicine men and *Batin* were highly important and valuable. This knowledge comprised of ancestral knowledge, self-possessed (through experience or dreams) and learned, among others. The accumulations of knowledge by these individuals often reflect the traditional knowledge possessed in the tribe.

In certain cases, the differences of traditional knowledge could be seen between the individuals whom might be originating from the same village e.g. in Tun Abdul Razak, Sungai Jang and Kolam Air. During the Resettlement Programme, Tun Abdul Razak was formed specifically to group the relocated Orang Asli villages in one settlement. It comprised of several villages from inside and outside of Kuala Kubu Bharu (Rajmah, 1971). The assimilation of knowledge between the villagers may have happened since then. Some of these villagers however, moved to form new villages outside of Tun Abdul Razak i.e. Kolam Air and Sungai Jang (sub-chapter 3.2.7 and 3.2.9). The traditional knowledge carried in these three villages, however, varied from one another. From the results obtained, little similarities of species, preparation and application of medicines with each other could be seen. This may be due to their adaptation or differences of knowledge possessed by the knowledgeable villagers in these villages (especially in Kolam Air and Sungai Jang).

Apart from deforestation, urbanisation and development have also changed the living areas of the Orang Asli. Most of the villages in this study have seen and lived the impacts that were brought upon them. In Ulu Kuang for example, Batin Buntal a/l Deraman mentioned that the quarry set up near the village cause the loss of natural resources in one of the hills and noise disturbance. The most obvious impact or damage perhaps could be seen in the villages in Carey Island. Not only were the mangrove areas

were thinning but the island itself was covered with oil palm plantations. This leaves hardly enough space even for cultivation of resources by the Orang Asli.

4.7.2 Natural resources utilized for consumption

The similar species used for consumption between the tribes and villages were higher than the medicinal resources. This was contributed mostly to the introduction, exposure and reliance of cultivated and reared species by the Orang Asli. As a result, wild species has been less consumed. This effect could be seen from their claim of knowing nothing of the edible wild species as they bought all of the resources from the market. Some of the villagers however mentioned that wild species would still be consumed when found and collected. The dwindling forested areas and wild species that the Orang Asli used to rely upon also affect their preferences towards the species bought from the market.

Natural resources used for consumption generally depend on its availability, adaptability and the edibility. This principle was firmly held by the Orang Asli, especially when they dwelled in the jungle. Although the majority of the natural resources recorded in this study were collected from the wild, none of the villagers fully depends on wild species in their daily lives. This was due to the travelling between the forested areas or their original settlement and their new settlement in order to collect the species. Furthermore, several species can only be collected during certain seasons.

Taboos or prohibition towards certain natural resources often involved pregnant and postnatal mothers (especially in confinement period) and children. These cautions probably originated from their own experiences, where the resources could trigger negative effects or conditions. Taboos mainly act on children and women. This shows the consideration and responsibility side of the Orang Asli in caring for these two groups. Additionally, Bolton (1972) mentioned that taboos on certain animal species

was due to the powerful spirit of the animal, which in turn could affect one's health. Thus, pregnant mothers and their spouses, newborn mothers and children were allowed to consume selected species with weak spirit only, so as not to affect their body as much (Bolton, 1972).

As the Mah Meri relies on fishing especially in two villages, Sungai Judah and Sungai Kurau, owning a boat was a necessity in this line of work. In Sungai Kurau, all of the villagers were involved in this activity. Their boats were owned presumably with some aid from the co-op or government. The Orang Asli in Sungai Judah may not fully rely on fishing in comparison in Sungai Kurau. Digo, a Chinese man married to a Mah Meri woman in Sungai Judah employed some of the Mah Meri in the village for fishing and collecting shellfishes. These catches and collections were later sold at his house, at the jetty near Sungai Judah, to the middlemen, hotels and restaurants. Other than this, the Mah Meri also depends on working in the plantations on the island or working in government or private sectors. The Temuan meanwhile depends on the collection of forest products (especially if there were demands for them), work in rubber plantation, government or private sectors in the nearby town. According to Batin Buntal a/l Deraman from Ulu Kuang, 95 % of the villagers depends on working outside of the village.

A study conducted by Tunisan (2002) showed that the reliance towards the employment outside of the village started out during the British occupation in Malaya until today. This was due to the less profit and stability brought by traditional economy of shifting cultivation and collecting and gathering (Tunisan, 2002). Nowadays, this was worsened due to the declining numbers of species that can be used or collected and sold. Furthermore, several species was being protected by the laws and this list of species was growing each year. These not only compromised the habitat of natural resources, but also the livelihood and economy of the Orang Asli.

Additionally, it was not fair to say that if the species was not mentioned in some of the villages it was not being consumed or used in any way. The main reason for the absence was perhaps the informants could not recall the specific details, utilization or the name of the species. This might be due to the lack of its utilization or, the vast number of natural resources consumed by the Orang Asli. Furthermore, without specimens or pictures to represent some of the species, identification and knowledge regarding the species could not be made and shared. The vernacular names used by the Orang Asli (even within the same tribe) in representing a species of natural resource in addition, could vary. Some of the informants, meanwhile, do display shyness towards outsiders even with the accompaniment of *Batin*.

4.7.3 Natural resources utilized for spiritual purpose

Originally, the Orang Asli was known to be animist. However, with the introductions of other religions, conversion of religion by the Orang Asli was common these days. These conversions in turn affect their way of life since. Not only they did not and could not practice their ancestral beliefs, but they also have to avoid specific species of natural resources prohibited by their new religion. As mentioned earlier in Chapter 2.3, the census done by JAKOA in 2008 shows that the Orang Asli was mostly animist. It was followed by other religions i.e. Islam, atheist, Christian, Buddhist, Hindu and Bahai. The Orang Asli, who converted to Islam among the villagers in this study, could be identified from their brick and pink coloured houses. It was built from the fund of Pusat Pungutan Zakat Malaysia. In addition, almost all of the Orang Asli villages in Selangor have *surau* built in the village. This facility was used as a place for religious teachers to teach Islam to Islamised Orang Asli in the village. In Ulu Kuang, the bridge in the village separated the animists and Muslim villagers. In Broga Village meanwhile, some of the villagers have converted to Islam and Christian while some preserve their

traditional belief. However, the villagers in this study did not show any discrimination towards their fellow converted villagers as they are allowed to practice their new religion in the villages.

Spiritual healing ceremony or *bersewang* was still practiced in some of the villages in this study. However, the need for it to happen has become less. This was possibly due to the duration it took for this ritual to complete i.e. a few days time. According to Kemi anak Khamis and Jais from Sungai Bumbun, this ceremony took about three days. It also consists of specific taboos for the healing practice to succeed.

CONCLUSION

A total of 546 natural resources from 219 families has been recorded and utilized by the Orang Asli in three categories of utilizations i.e. medicine, consumption and spiritual. From this number, 41.6 % were utilized as medicine, 71.8 % for consumption and 4.4 % for spiritual purpose. Most of these natural resources were collected or gathered from the wild with 80.0 % (437 species) of the natural resources. Cultivated or reared species meanwhile only shows 17.9 % (98 species) of the natural resources recorded. On the other hand, for both cultivated and wild species, they consisted of only plant species with 2.0 % (11 species). Overall, 440 species of the natural resources recorded were mentioned by the respondents from the Temuan tribe and 213 species are from the Mah Meri tribe. From these numbers, 107 species were similarly mentioned by both tribes. A total number of 93 species of natural resources (17.0 %) meanwhile were used in more than one categories of utilization.

The results for each category of natural resources and utilizations between the Mah Meri and Temuan tribes reveal low similarity of species used by both tribes. Similar results were also shown for the similarity of species mentioned between each village in this study, except in medicinal and edible mushroom categories. High similarities were shown between the villages from the same tribe.

The main factors for this low similarity were the difference in geographical areas and availability of the species. While the Mah Meri tribe living near the coastal areas, the Temuan tribe was well known living near the hilly areas. The natural resources utilized by the Mah Meri tribe were usually found in the mangrove forest and the sea. The Temuan tribe on the other hand, utilized the species found in the primary or secondary forest near their settlement.

From this study, it can be concluded that the Orang Asli traditional knowledge is decreasing, mainly due to their reliance towards modernization in the form of modern medicine, technology and natural resources from the market. In addition, the lack of interest of the younger generation also affects the transferring of the traditional knowledge from the older generation. Even with the interest shown, the natural resources were harder to be obtained due to development and logging. Other than that, the conversions of religion prohibit them from consuming several numbers of natural resources and practicing their tradition. Thus, only oral knowledge that they could recalled were shared. Meanwhile, the people who usually possessed traditional knowledge among the Orang Asli were the *Batin*, *Ketua Kampung*, *Tok Jenang*, medicine men and the villagers from the age of 50 years old and above. However, the numbers of these people were decreasing each day.

Therefore, documentation of this traditional knowledge on the use of natural resources is important for future validation by the scientific community. Any significant findings and patents obtained through this knowledge must give its recognition to the respective Orang Asli tribe.

REFERENCES

- Abdulelah, H. A.-A., Zurainee, M. N., Hesham, M. A.-M. & Rohela, M. (2010). Ethnobotanical study on some Malaysian anti-malarial plants: a community based survey. *Journal of Ethnopharmacology*, 132(1), 362-364. [doi: 10.1016/j.jep.2010.08.006]
- Adcock, I. M. (1997). Asthma. In R. Dulbecco (Ed.), *Encyclopedia of human biology* (2nd ed., Vol. 1, pp. 523-530). California: Academic Press.
- Adhikari, Y. P. & Fischer, A. (2010). Trend analysis and purpose of use of some important plant and animal species of Ghandruk VDC, Nepal. *Our Nature*, 8, 122-130.
- Adi, T., Hood, S. & Rashid, S. (Eds.). (2006). *Orang Asli: the hidden treasure*. Kuala Lumpur: Jabatan Muzium Negara.
- Ahmad, I. (1984). *Komuniti Orang Asli di Kampung Bukit Tampoi, Sepang, Selangor: tinjauan perbandingan sosiobudaya menurut Islam*. (Unpublished bachelor's thesis), Universiti Kebangsaan Malaysia, Bangi.
- Amal, N. H., Parameswarthy, R., Tee, G. H., Gurpreet, K. & Karuthan, C. (2011). Prevalence of chronic illness and health seeking behaviour in Malaysian population: results from the Third National Health Morbidity Survey (NHMS III) 2006. *Med J Malaysia*, 66, 36-41.
- Amran, K. (1991). *Santau dan kaedah rawatan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Antares. (2006). *Tanah tujuh*. Kuala Lumpur: Silverfish Books.
- Ariffin, N. (1979). A brief introduction to the Orang Seletar of the Johor coast with special reference to Kampung Simpang Arang. In A. Walker (Ed.), *Social*

Anthropology Section. Pulau Pinang: School of Comparative Social Sciences, Universiti Sains Malaysia.

- Au, D. T., Wu, J., Jiang, Z., Chen, H., Lu, G. & Zhao, Z. (2008). Ethnobotanical study of medicinal plants used by Hakka in Guangdong, China. *Journal of Ethnopharmacology*, 117(1), 41-50. [doi: 10.1016/j.jep.2008.01.016]
- Ayampillay, S. D. (1976). Kampung Tanjung Sepat: a Besese (Mah Meri) community of coastal Selangor. In A. Walker (Ed.), *Social Anthropology Section*. Pulau Pinang: School of Comparative Social Sciences, Universiti Sains Malaysia.
- Babu, B. H., Shylesh, B. S. & Padikkala, J. (2002). Tumour reducing and anticarcinogenic activity of *Acanthus ilicifolius* in mice. *Journal of Ethnopharmacology*, 79(1), 27-33. [doi: 10.1016/S0378-8741(01)00347-6]
- Baer, A. S. (2010). *Orang Asli (indigenous Malaysian) biomedical bibliography* (pp. 68). [Retrieved from <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/15784/OABiomedicalBibliography.pdf?sequence=1>]
- Bandaranayake, W. M. (2002). Bioactivities, bioactive compounds and chemical constituents of mangrove plants. *Wetlands Ecology and Management*, 10, 421-452.
- Barzilai, N. & Shamoan, H. (1997). Diabetes mellitus. In R. Dulbecco (Ed.), *Encyclopedia of human biology* (2nd ed., Vol. 3). California: Academic Press.
- Benjamin, G. (1973). Introduction. In P. Schebesta (Ed.), *Among the forest dwarfs of Malaya* (pp. v - xii). Kuala Lumpur: Oxford University Press.
- Bhat, R. & Karim, A. A. (2010). Tongkat ali (*Eurycoma longifolia* jack): a review on its ethnobotany and pharmacological importance. *Fitoterapia*, 81(7), 669-679. [doi: 10.1016/j.fitote.2010.04.006]

- Bolton, J. M. (1972). Food taboos among the Orang Asli in West Malaysia: a potential nutritional hazard. *The American Journal of Clinical Nutrition*, 25(August), 789-799.
- Burkill, I. H. (1966a). *A dictionary of the economic products of the Malay Peninsula* (Vol. 2 (I-Z)). Kuala Lumpur: Published on behalf of the governments of Malaysia and Singapore by the Ministry of Agriculture and cooperatives.
- Burkill, I. H. (1966b). *A dictionary of the economic products of the Malay Peninsula* (Vol. 1 (A-H)). Kuala Lumpur: Published on behalf of the governments of Malaysia and Singapore by the Ministry of Agriculture and cooperatives.
- Carey, I. (1968). The Orang Asli and social change. *Fed. Museum Journal New Series*, 13, 57-64.
- Carey, I. (1976). *Orang Asli: the aboriginal tribes of Peninsular Malaysia*. Kuala Lumpur: Oxford University Press.
- Chang, Y. S. & Lee, S. S. (2003). Utilization of wild mushrooms by the Temuans in Selangor, Malaysia. In M. Azmy, P. Ismail, I. Shamsudin, M. Y. Safiah Yusmah, H. F. Lim, M. I. Muhammed Azmi, A. G. Ab. Rasip, U. Salmiah & H. Khali Azizi (Eds.), *Proceedings of the international conference on forestry and forest products research: tropical forestry research in the new millennium meeting demands and challenges* (pp. 488-489). Kuala Lumpur: Forest Research Institute.
- Charaya, M. U. & Mehrotra, R. S. (1999). From ethnomycology to fungal biotechnology: a historical perspective. In J. Singh & K. R. Aneja (Eds.), *Proceedings of the international conference. From ethnomycology to fungal biotechnology: exploiting fungi from natural resources for novel products* (pp. 1-10). New York, NY: Plenum Press.

- Chin, J., Hawk, D. & O' Neil, P. (1997). East and South-east Asia. In Minority Rights Group (Ed.), *World directory of minorities* (pp. 588-651). London: Minority Rights Group International.
- Clément, D. (1998). The historical foundations of ethnobiology (1860 - 1899). *Journal of Ethnobiology*, 18(2), 161-187.
- Cotton, C. M. (1996). *Ethnobotany: principles and applications*. Chichester: John Wiley & Sons.
- Cox, P. A. (1994). The ethnobotanical approach to drug discovery; strength and limitations. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 25-41). Chichester: John Wiley.
- Davis, E. W. (1995). Ethnobotany: an old practice, a new discipline. In R. E. Schultes & S. von Reis (Eds.), *Ethnobotany: evolution of discipline* (pp. 40-51). Oregon: Timber Press, Inc.
- Dentan, R. K. (1968). *The Semai: a non-violent people of Malaya*. New York: Holt, Rinehart and Winston.
- Dentan, R. K. (2003). *Preliminary field notes on the Semai language*. Manuscript. [Retrieved from <http://www.keene.edu/library/orangasli/dentanbaer.pdf>].
- Department of Statistic Malaysia. (2009). *Buku tahunan perangkaan Malaysia 2008 (Yearbook of statistics Malaysia 2008)*. Putrajaya: Department of Statistics, Malaysia [Retrieved from http://www.statistics.gov.my/portal/download_Buku_Tahunan/files/BKKP/Buku_Tahunan_Perangkaan_Malaysia_2008.pdf].
- Dharmu, I., Ramamurty, N., Kannan, R. & Babu, M. (2007). Cytotoxic effect of achatinin_H (lectin) from *Achatina fulica* against a human mammary carcinoma

- cell line (MCF7). *In Vitro Cellular & Developmental Biology - Animal*, 43(8-9), 306-314. [doi: 10.1007/s11626-007-9055-z]
- Dixit, A. K., Kadavul, K., Rajalakshmi, S. & Shekhawat, M. S. (2010). Ethno-medico-biological studies of South India. *Indian Journal of Traditional Knowledge*, 9(1), 116-118.
- du Vigneaud, V. & Patterson, W. I. (1936). The synthesis of djenkolic acid. *The Journal of Biological Chemistry*, 114(2), 533-538.
- Endicott, K. (1979). *Batek Negrito religion: the world view and rituals of hunting and gathering people of Peninsular Malaysia*. Oxford: Clarendon Press.
- Er, A. C., Zalina, C. M. A. & Pereira, J. J. (2010). Sosioekonomi masyarakat Orang Asli: kajian kes di hutam simpan Bukit Lagong, Selangor, Malaysia. *Jurnal Melayu*, 5, 295-314.
- Evans, I. H. N. (1923). *Studies in religion, folk-lore, & custom in British North Borneo and the Malay Peninsula*. London: F. Cass
- Evans, I. H. N. (1937). *The Negritos of Malaya*. Cambridge: Cambridge University Press.
- Faridah Hanum, I. & Nurulhuda, H. (1999). The use of medicinal plant species by the Temuan tribe of Ayer Hitam Forest, Selangor, Peninsular Malaysia. *Pertanika J. Trop. Agric. Sci.*, 22(2), 85-94.
- Faridah Hanum, I. & Khamis, S. (2004). *A guide to the common plants of Ayer Hitam Forest Selangor, Peninsular Malaysia*. Serdang: Universiti Putra Malaysia Press.
- Farnsworth, N. R. (1994). Ethnopharmacology and drugs development. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 42-59). Chichester: John Wiley.

- Fasihuddin, B. A. & Ghazally, I. (2003). Medicinal plants used by KadazanDusun communities around Crocker Range. *ASEAN Review of Biodiversity and Environmental Conservation (ARBEC)*, January - March 2003, 1-10.
<http://www.arbec.com.my/pdf/art1janmar03.pdf>
- Fatin Nuraini, K. (2009). *Penilaian terhadap sumber tumbuhan oleh komuniti Orang Asli di Kg. Kolam Air, Kuala Kubu Bharu, Hulu Selangor, Selangor*. (Unpublished bachelor's thesis), University of Malaya, Kuala Lumpur.
- Fix, A. G. (1975). Fission-fusion and lineal effect: aspects of the population structure of the Semai Senoi of Malaysia. *American Journal of Physical Anthropology*, 43(2), 295-302.
- Gimlette, J. D. & Thomson, H. W. (1971). *A dictionary of Malayan medicine*. Kuala Lumpur: Oxford University Press.
- Gomes, A. G. (1979). *Ecological adaptation and population change: a comparative study of Semang foragers and Temuan horticulturists*. University of Malaya, Kuala Lumpur.
- Graham, J. G., Quinn, M. L., Fabricant, D. S. & Farnsworth, N. R. (2000). Plants used against cancer - an extension of the work of Jonathan Hartwell. *Journal of Ethnopharmacology*, 73(3), 347-377. [doi: 10.1016/S0378-8741(00)00341-X]
- Graham, K. M. & Fauzi, D. (1991). Edible wild mushrooms of Malaysia, Singapore and Thailand. *Malays. Appl. Biol.*, 20(2), 223-226.
- Hale, A. (1909). *The adventures of John Smith in Malaya 1600 - 1605*. Leyden: Late E.J. Brill Publishers and Printers.
- Hamilton, A. (2005). Orang Asli. In C. Skutsch & M. Ryle (Eds.), *Encyclopedia of the world's minorities* (Vol. 2, pp. 932-934). New York, NY: Routledge.
- Harsh, N. S. K., Rai, B. K. & Soni, V. K. (1999). Some ethnomycological studies from Madhya Pradesh, India. In J. Singh & K. R. Aneja (Eds.), *From ethnomycolology*

- to fungal biotechnology* (pp. 19-31). New York: Kluwer Academic/ Plenum Publisher.
- Hawkins, J. M. (Ed.) (2008) Kamus dwibahasa Oxford Fajar (4th ed.). Shah Alam: Oxford Fajar Sdn Bhd.
- Holmes, D. (1998). *The birds of Peninsular Malaysia*. Kuala Lumpur: Oxford University Press.
- Howell, C. J., Schwabe, K. A. & Azizan, A. S. (2010). Non-timber forest product dependence among the *Jah Hut* subgroup of Peninsular Malaysia's Orang Asli. *Environ Dev Sustain*, 12, 1-18. [doi: 10.1007/s10668-008-9176-x]
- Hunn, E. (2007). Ethnobiology in four phases. *Journal of Ethnobiology*, 27(1), 1-10.
- Höft, M., Barik, S. K. & Lykke, A. M. (1999). *Quantitative ethnobotany: applications of multivariate and statistical analyses in ethnobotany*. People and Plants working paper 6. UNESCO, Paris.
- Inta, A., Shengji, P., Balslev, H., Wangpakapattanawong, P. & Trisonthi, C. (2008). A comparative study on medicinal plants used in Akha's traditional medicine in China and Thailand, cultural coherence or ecological divergence? *Journal of Ethnopharmacology*, 116(3), 508-517. [doi: 10.1016/j.jep.2007.12.015]
- Iskandar, T. (Ed.) (1970) Kamus dewan (1st ed.). Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Jabatan Kemajuan Orang Asli. (2008). *Data maklumat asas Jabatan Hal Ehwal Orang Asli tahun 2008*. Selangor: Bahagian Perancangan dan Penyelidikan Jabatan Kemajuan Orang Asli.
- Jain, S. K. (1994). Ethnobotany and research on medicinal plants in India. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 153-168). Chichester: John Wiley.

- Jamir, N. S. & Lal, P. (2005). Ethnozoological practices among Naga tribes. *Indian Journal of Traditional Knowledge*, 4(1), 100-104.
- Jumper, R. D. L. (2001). *Death waits in the "dark": the Senoi Praaq, Malaysia's killer elite*. Connecticut: Greenwood Press.
- Kamaruddin, M.-S. & Jackson, D. (2006). Therapeutic and pharmaceutical potential of Asian Annonaceae. In M. Azahar, S. Mohd. Hamami, S. Ahmad Said, Q.-Z. Faridah, A. S. Nor Aini, M. S. Jalil & I. Faridah-Hanum (Eds.), *Sustainable management and utilization of medicinal plant resources* (pp. 124-148). Kuala Lumpur: Universiti Putra Malaysia dan Jabatan Perhutanan Semenanjung Malaysia.
- Kamarudin, M.-S. & Latiff, A. (Eds.). (2002). *Tumbuhan ubatan Malaysia*. Bangi: Pusat Pengurusan Penyelidikan UKM.
- Katewa, S. S., Guria, B. D. & Jain, A. (2001). Ethnomedicinal and obnoxious grasses of Rajasthan, India. *Journal of Ethnopharmacology*, 76(3), 293-297. [doi: 10.1016/S0378-8741(01)00233-1]
- Keng, H. (1969). *Orders and families of Malayan seed plants*. Kuala Lumpur: University of Malaya Press.
- Khamis, S., Faridah-Hanum, I., Manap, T. & Mokhtar, A. F. (2006). Ethnobotany of the Jakun tribe in Sg. Bebar, Pahang. In M. Azahar, S. Mohd. Hamami, S. Ahmad Said, Q.-Z. Faridah, A. S. Nor Aini, M. S. Jalil & I. Faridah-Hanum (Eds.), *Sustainable management and utilization of medicinal plant resources* (pp. 78-86). Kuala Lumpur: Universiti Putra Malaysia dan Jabatan Perhutanan Semenanjung Malaysia.
- Khatun, M. A., Harun-Or-Rashid, M. & Rahmatullah, M. (2011). Scientific validation of eight medicinal plants used in traditional medicinal systems of Malaysia: a review. *American-Eurasian Journal of Sustainable Agriculture*, 5(1), 67-75.

- Kim, Y. C. (Ed.) (2006) *Kamus Mah Meri-Melayu-Inggeris (A Mah Meri-Malay-English dictionary)*. Kuala Lumpur: Fakulti Bahasa dan Linguistik Universiti Malaya.
- King, V. T. & Wilder, W. D. (2003). South-East Asia: a field of anthropological enquiry? *The modern anthropology of South-East Asia: an introduction* (pp. 1-24). London: Routledge Curzon.
- Kroeber, A. L. (1928). *Peoples of the Philippines* (2nd ed.). Connecticut: Greenwood Press.
- Kulip, J. (2003). An ethnobotanical survey of medicinal and other useful plants of Muruts in Sabah, Malaysia. *Telopea*, 10(1), 81-98.
- Langenberger, G., Prigge, V., Martin, K., Belonias, B. & Sauerborn, J. (2009). Ethnobotanical knowledge of Philippine lowland farmers and its application in agroforestry. *Agroforest Syst*, 76, 173-194. [doi: 10.1007/s10457-008-9189-3]
- Larsen, K., Ibrahim, H., Khaw, S. H. & Saw, L. G. (1999). *Gingers of Peninsular Malaysia and Singapore*. Kota Kinabalu: Natural History Publication (Borneo).
- Lawrence, E. (Ed.) (2008) *Henderson's Dictionary of Biology* (14th ed.). Harlow: Pearson Education Limited.
- Lee, S. S., Chang, Y. S. & Noraswati, M. N. R. (2006). *Common edible mushrooms of Orang Asli communities in Peninsular Malaysia*. Kepong: Forest Research Institute Malaysia.
- Lee, S. S. & Chang, Y. S. (2007). Ethnomycology. In E. B. G. Jones, K. D. Hyde & S. Vikineswary (Eds.), *Malaysian fungal diversity* (pp. 307-318). Malaysia: Mushroom Research Centre, University of Malaya and Ministry of Natural Resources and Environment.

- Lee, S. S., Chang, Y. S. & Noraswati, M. N. R. (2009). Utilization of macrofungi by some indigenous communities for food and medicine in Peninsular Malaysia. *Forest Ecology and Management*, 257, 2062-2065.
- Lee, S. S., Tan, N. H., Fung, S. Y., Pailoor, J. & Sim, S. M. (2011). Evaluation of the sub-acute toxicity of the sclerotium of *Lignosus rhinocerus* (Cooke), the Tiger Milk mushroom. *Journal of Ethnopharmacology*, 138(1), 192-200. [doi: 10.1016/j.jep.2011.09.004]
- Lim, B. L. (1981). *Orang Asli animal tales*. Kuala Lumpur: Eastern Universities Press.
- Liu, G.-M., Liang, Y.-L., Weng, L., Su, W.-J., Yuan-Yuan, H. & Cao, M.-J. (2010). Purification and identification of the major allergen of mud crab. *Acta Hydrobiologica Sinica*, 34(1), 108-114. [doi: 10.3724/SP.J.1035.2010.00108]
- Lohani, U. (2011). Traditional uses of animals among *Jirels* of Central Nepal. *Studies on Ethno-Medicine*, 5(3), 115-124.
- Lozoya, X. (1994). Two decades of Mexican ethnobotany and research on plant-derived drugs. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 130-152). Chichester: John Wiley.
- Ludwig, J. A. & Reynolds, J. F. (1988). *Statistical ecology: a primer on methods and computing*. New York: John Wiley & Sons.
- Lye, T.-P. (2001). *Orang asli of Peninsular Malaysia: a comprehensive and annotated bibliography*. Kyoto: Center for Southeast Asian Studies, Kyoto University.
- Mahawar, M. M. & Jaroli, D. P. (2008). Traditional zootherapeutic studies in India: a review. *Journal of Ethnobiology and Ethnomedicine*, 4(1), 17. [doi: 10.1186/1746-4269-4-17]

- Mak-Mensah, E. E., Komlaga, G. & Terlabi, E. O. (2010). Antihypertensive action of ethanolic extract of *Imperata cylindrica* leaves in animal models. *Journal of Medicinal Plants Research*, 4(14), 1486-1491.
- Man, E. H. (1975). *Aboriginal inhabitants of the Andaman Islands*. Delhi: Sanskaran Prakashak.
- Martin, G. J. (1995). *Ethnobotany: A methods manual*. London: Chapman & Hall.
- Medway, L. (1978). *The wild mammals of Malaya (Peninsular Malaysia) and Singapore* (2nd ed.). Kuala Lumpur: Oxford University Press.
- Mohammad Mohsin, A. K. & Mohd. Azmi, A. (1983). *Freshwater fishes of Peninsular Malaysia*. Selangor: Penerbit Universiti Pertanian Malaysia.
- Mohd Fauzi, M. H. & Nor Aini, H. I. (2009). Asal usul Orang Asli di Malaysia *Pembangunan masyarakat Orang Asli: dilema miskin dan terpinggir* (pp. 1-28). Shah Alam: Pusat Penerbitan Universiti (UPENA).
- Mohd Naim, A. (2011, 26th June). Pribumi asli Kuala Koh, *Utusan Malaysia (Mingguan Malaysia)*, p. 12.
- Mohd Nizam, S. (2001). *Pemikiran Orang Asli tentang agama: satu kajian khusus di perkampungan Orang Asli Broga, Hulu Langat, Selangor Darul Ehsan*. (Unpublished master's thesis), University of Malaya, Kuala Lumpur.
- Negi, C. S. & Palyal, V. S. (2007). Traditional uses of animal and animal products in medicine and rituals by the Shola tribes of district Pthoragarh, Uttaranchal, India. *Studies on Ethno-Medicine*, 1(1), 47-54.
- Ngamriabsakul, C. & Kommen, H. (2009). The preliminary detection of cyanogenic glycosides in Pra (*Elateriospermum tapos* Blume) by HPLC. *Walailak J Sci & Tech*, 6(1), 141-147.

- Ngui, R., Lim, Y. A. L., Chow, S. C., Bruyne, J. A. d. & Liam, C. K. (2011). Prevalence of bronchial asthma among Orang Asli in Peninsular Malaysia. *Med J Malaysia*, 66(1), 27-31.
- Nicholas, C. (1996). The Orang Asli in Peninsular Malaysia. In C. Nicholas & R. Singh (Eds.), *Indigenous people of Asia* (pp. 157-176). Bangkok: Asia Indigenous Peoples Pact.
- Noone, R. (1972). *The rape of the dream people*. London: Hutchinson.
- Noor Zaharah, M. R. (2003). *Nilai kepelbagaian biologi terhadap Orang Asli suku kaum Temuan Hulu Kemensah Hulu Kelang, Selangor*. Universiti Pertanian Malaysia, Serdang.
- Noresah, B., Md. Nor, A. G., Ibrahim, A., Azizah, S., Saidah, K., Aziah, T., Salmah, J., Hairani, M. K. & Rodziah, A. (Eds.). (2005) *Kamus dewan* (4th ed.). Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Norfaizah, S. (2009). *Penilaian sumber yang digunakan oleh masyarakat Orang Asli di Kampung Tun Abdul Razak, Kuala Kubu Bharu, Selangor*. (Unpublished bachelor's thesis), University of Malaya, Kuala Lumpur.
- Norton, R. L. & Hoffmann, P. R. (2012). Selenium and asthma. *Molecular Aspects of Medicine*, 33(1), 98-106. [doi: 10.1016/j.mam.2011.10.003]
- Norwahidah, S. (1998). *Pandangan Orang Asli terhadap alam sekitar. Kajian kes: Kampung Genting Peras dan Kampung Kuala Pangson, Hulu Langat, Selangor*. (Unpublished master's thesis), Universiti Putra Malaysia, Serdang.
- Nowak, B. S. (2004). Btsisi', Blandas, and Malays: ethnicity and identity in the Malay Peninsula Based on Btsisi' folklore and ethnohistory. *Asian Folklore Studies*, 63(2), 303-323.

- Nur Awanis, R. (2009). *Nilai sumber tumbuh-tumbuhan oleh Orang Asli di Kampung Kuala Kerling, Kuala Kubu Bharu, Selangor*. (Unpublished bachelor's thesis), University of Malaya, Kuala Lumpur.
- Nur Syuhanis, M. (2009). *Satu penilaian tumbuh-tumbuhan yang digunakan oleh komuniti masyarakat Orang Asli di Kampung Sungai Jang, Kuala Kubu Bharu, Hulu Selangor, Selangor*. University of Malaya, Kuala Lumpur.
- Ong, H. C. (1986). *Ecology, resource utilization and ethnobiology of the Temuan at Ulu Langat, Selangor*. (Unpublished doctoral's thesis), University of Malaya, Kuala Lumpur.
- Ong, H. C. & Nordiana, M. (1999). Malay ethno-medico botany in Machang, Kelantan, Malaysia. *Fitoterapia*, 70, 502-513.
- Ong, H. C. & Norzalina, J. (1999). Malay herbal medicine in Gemencheh, Negeri Sembilan, Malaysia. *Fitoterapia*, 70, 10-14.
- Ong, H. C. (2008). *Tumbuhan liar: khasiat ubatan & kegunaan lain*. Kuala Lumpur: Utusan Publications & Distributions.
- Ong, H. C., Chua, S. & Pozi, M. (2011a). Ethno-medicinal plants used by the Temuan villagers in Kampung Jeram Kedah, Negeri Sembilan, Malaysia. *Studies on Ethno-Medicine*, 5(2), 95-100.
- Ong, H. C., Chua, S. & Pozi, M. (2011b). Traditional knowledge of edible plants among the Temuan villagers in Kampung Jeram Kedah, Negeri Sembilan, Malaysia. *Scientific Research and Essays*, 6(4), 694-697.
- Ong, H. C., Rosnaini, M. Z. & Pozi, M. (2011c). Traditional knowledge of medicinal plants among the Malay villagers in Kampung Mak Kemas, Terengganu, Malaysia. *Studies on Ethno-Medicine*, 5(3), 175-185.

- Ong, H. C., Ruzalila, B. N. & Pozi, M. (2011d). Traditional knowledge of medicinal plants among the Malay villagers in Kampung Tanjung Sabtu, Terengganu, Malaysia. *Indian Journal of Traditional Knowledge*, 10(3), 460-465.
- Ong, H. C., Lina, E. & Pozi, M. (2012). Traditional knowledge and usage of edible plants among the Semai community of Kampung Batu 16, Tapah, Perak, Malaysia. *Scientific Research and Essays*, 7(4), 441-445. [doi: 10.5897/SRE11.781]
- Padmanabhan, P. & Sujana, K. A. (2008). Animal products in traditional medicine from Attappady hills of Western Ghats. *Indian Journal of Traditional Knowledge*, 7(2), 326-329.
- Parkin, R. (1991). *A guide to Austroasiatic speakers and their languages*. Honolulu: University of Hawaii Press.
- Pearsall, J. (Ed.) (2002) *Concise Oxford English dictionary* (10th ed.). New York: Oxford University Press.
- Pegler, D. & Spooner, B. (1997). *The mushroom identifier*. London: Quantum Books Ltd.
- Piggott, A. G. (1988). *Ferns of Malaysia in colour*. Kuala Lumpur: Tropical Press Sdn. Bhd.
- Polunin, I. (1952). Anthropological problems encountered during disease survey of Malayan Aborigines. *Man*, 52, 70-71.
- Polunin, I. (1953). The medical history of Malayan Aborigines. *Medical Journal of Malaya*, 8, 55-174.
- Polunin, I. (1994). *Plants and flowers of Malaysia*. Singapore: Times Edition.
- Prance, G. T. (1994). Introduction. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 1-3). Chichester: John Wiley.

- Rajmah, A. S. (1971). *Komuniti Temuan di Kuala Kubu Bharu: satu kajian mengenai Orang Asli di perkampungan semula dengan menyentuh soal perubahan*. University of Malaya, Kuala Lumpur.
- Ratos, A. (2006). *Orang Asli and their wood art*. Singapore: Marshall Cavendish Editions.
- Razha, R. (1995). Introduction. In R. Razha (Ed.), *Indigenous minorities of Peninsular Malaysia: selected issued and ethnographies* (pp. 1-17). Kuala Lumpur: Intersocietal and Scientific Sdn. Bhd. (INAS).
- Real, R. & Vargas, J. M. (1996). The probabilistic of Jaccard's index of similarity. *Systematic Biology*, 45(3), 380-385.
- Reza, H., Haq, W. M., Das, A. K., Rahman, S., Jahan, R. & Rahmatullah, M. (2011). Anti-hyperglycemic and antinociceptive activity of methanol leaf and stem extract of *Nypa fruticans* Wurmb. *Pak. J. Pharm. Sci.*, 24(4), 485-488.
- Ridley, H. N. (1922). *The flora of the Malay Peninsula* (Vol. 1). London: L. Reeve & Co.
- Ridley, H. N. (1924a). *The flora of the Malay Peninsula* (Vol. 3). London: L. Reeve & Co.
- Ridley, H. N. (1924b). *The flora of the Malay Peninsula* (Vol. 4). London: L. Reeve & Co.
- Ridley, H. N. (1925). *The flora of the Malay Peninsula* (Vol. 5). London: L. Reeve & Co.
- Roosita, K., Kusharto, C. M., Sekiyama, M., Fachrurozi, Y. & Ohtsuka, R. (2008). Medicinal plants used by the villagers of a Sundanese community in West Java, Indonesia. *Journal of Ethnopharmacology*, 115(1), 72-81. [doi: 10.1016/j.jep.2007.09.010]

- Rosnah, A. (1982). *Useful plants of the Temuans in Ulu Gombak and Ulu Langat, Selangor*. University of Malaya, Kuala Lumpur.
- Rukayah, A. (2006). *Tumbuhan liar berkhasiat ubatan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Samuel, A. J. S. J., Kalusalingam, A., Chellappan, D. K., Gopinath, R., Radhamani, S., Azman, H., Muruganandham, V. & Promwichit, P. (2010). Ethnomedical survey of plants used by the Orang Asli in Kampung Bawong, Perak, West Malaysia. *Journal of Ethnobiology and Ethnomedicine*, 6(1), 5.
<http://www.ethnobiomed.com/content/6/1/5> [doi:10.1186/1746-4269-6-5]
- Samy, J., Sugumaran, M. & Lee, K. L. W. (2005). *Herbs of Malaysia: and introduction to the medicinal, culinary, aromatic, and cosmetic use of herbs*. Selangor: Times Edition.
- Sawyer, F. H. (1900). Aetas or Negritos *The inhabitants of the Philippines* (pp. 201-207). New York: Charles Scribner's Sons.
- Schebesta, P. (1973). *Among the forest dwarfs of Malaya*. Kuala Lumpur: Oxford University Press.
- Schultes, R. E. (1994). Amazonian ethnobotany and the search for new drugs. In G. T. Prance, D. J. Chadwick & J. Marsh (Eds.), *Ethnobotany and the search for new drugs (Ciba Foundation Symposium 185)* (pp. 60-76). Chichester: John Wiley.
- Schultes, R. E. & von Reis, S. (1995). Ethnopharmacology. In R. E. Schultes & S. von Reis (Eds.), *Ethnobotany: evolution of a discipline* (pp. 383-384). Portland, OR: Timber Press.
- Setyowati, F. M. (2010). Etnofarmakologi dan pemakain tanaman obat suku Dayak Tunjung di Kalimantan Timur. *Media Litbang Kesehatan*, 20(3), 104-112.

- Shreema, R. (2007). *Prevalence of hypertension and its risk factors among the urban and rural Orang Asli in Selangor, Pahang, and Kelantan*. (Unpublished master's thesis), Universiti Kebangsaan Malaysia, Bangi.
- Singh, J. (1999). Ethnomycology and folk remedies: fact and fiction. In J. Singh & K. R. Aneja (Eds.), *Proceedings of the international conference. From ethnomycology to fungal biotechnology: exploiting fungi from natural resources for novel products* (pp. 11-17). New York, NY: Plenum Press.
- Singh, S. (2011, April 13). Govt to conduct health and morbidity survey every four years, *The Star*. [Retrieved from <http://thestar.com.my/news/story.asp?file=/2011/4/13/nation/8468886&sec=nation>]
- Siti Hasmah, M. A. (1987). *Wanita: adat dan kesihatan* (Vol. 2). Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Skeat, W. W. & Blagden, C. O. (1906a). *Pagan races of the Malay Peninsula* (Vol. 2). London: Mac Millan & Co.
- Skeat, W. W. & Blagden, C. O. (1906b). *Pagan races of the Malay Peninsula* (Vol. 1). London: Mac Millan & Co.
- Soto-Blanco, B. & Górniak, S. L. (2010). Toxic effects of prolonged administration of leaves of cassava (*Manihot esculenta* Crantz) to gotas. *Experimental and Toxicologic Pathology*, 62, 361-366. [doi: 10.1016/j.etp.2009.05.011]
- Stengler, M. (2005). The nature of mushroom. In C. Rosenberg (Ed.), *The health benefits of medicinal mushrooms* (pp. 3-13). California: Basic Health Publications, Inc.
- Stephenson, J. (1977). *The ethnoecology of the Temuan of Kampung Paya Lebar* (Unpublished bachelor's thesis), University of Malaya, Kuala Lumpur.

- Suharti, S. (2005). *Forest plants used for aphrodisiac by the Temuan tribe of Ulu Gombak, Selangor*. Universiti Pertanian Malaysia, Serdang.
- Sutton, M. Q. & Anderson, E. N. (2004). *Introduction to cultural ecology*. Oxford: Berg.
- Tabuti, J. R. S., Lye, K. A. & Dhilion, S. S. (2003). Traditional herbal drugs of Bulamogi, Uganda: plants, use and administration. *Journal of Ethnopharmacology*, 88(1), 19-44. [doi: 10.1016/S0378-8741(03)00161-2]
- Tamang, G. (2003). An ethnobiological study of the Tamang people. *Our Nature*, 1, 37-41.
- Toader-Williams, A. & Golubkina, N. (2009). Investigating upon th edible snail's potential as source of selenium for human health and nutrition observing its food chemical contaminant risk factor with heavy materials. *Bulletin UASVM Agriculture*, 66(2), 495-499.
- Trumble, W. R. & Stevenson, A. (Eds.). (2002) *Shorter Oxford English dictionary: on historical principles* (5th ed.). Oxford: Oxford University Press.
- Tunisan, S. (2002). *Kajian sosio-ekonomi masyarakat Orang Asli: kajian kes terhadap masyarakat Orang Asli di penempatan Bt12, Gombak*. (Unpublished bachelor's thesis), University of Malaya, Kuala Lumpur.
- van Valkenburg, J. L. C. H. & Bunyapraphatsara, N. (Eds.). (2002). *Plant resource of South East Asia No 12(2). Medicinal and poisonous plants 2*. Bogor, Indonesia: Prosea Foundation.
- Vermeulen, H. F. (1996). Enlightenment anthropology. In A. Barnard & J. Spencer (Eds.), *Encyclopedia of social and cultural anthropology*. London: Routledge.
- Vikineswary, S., Noorlidah, A., Normah, I., Tan, Y. H., Fauzi, D. & Jones, E. B. G. (2007). Edible and medicinal mushrooms. In S. Vikineswary, E. B. G. Jones & K. D. Hyde (Eds.), *Malaysian Fungal Diversity* (pp. 287-305). Kuala Lumpur:

- Mushroom Research Centre, University of Malaya and Ministry of Natural Resources and Environment, Malaysia.
- Villaseñor, I. M. & Lomadrid, M. R. A. (2006). Comparative anti-hyperglycemic potentials of medicinal plants. *Journal of Ethnopharmacology*, 104, 129-131.
- Waite, M. (Ed.) (2007) Oxford dictionary & thesaurus (2nd ed.). Oxford: Oxford University Press.
- Wazir Jahan, K. (1995). Transformation in Ma' Betise' economics and ideology: recurrent themes if nomadism. In R. Razha (Ed.), *Indigenous minorities of Peninsular Malaysia: selected issues and ethnographis* (pp. 109-127). Kuala Lumpur: Intersocietal and Scientific Sdn. Bhd. (INAS).
- Werner, R. (1974). *Mah Meri of Malaysia: art and culture*. Kuala Lumpur: Penerbit Universiti Malaya.
- Werner, R. (1986). *Bomoh-poyang: traditional medicine and ceremonial art of the aborigines of the Malaysia*. Kuala Lumpur: Department of Publications University of Malaya.
- Wiar, C. (2002). *Medicinal plants of Southeast Asia* (2nd ed.). Selangor: Pelanduk Publications.
- Wiar, C. (2006). *Medicinal plants of Asia and the Pacific*. Florida: Taylor & Francis Group, LLC.
- Williams-Hunt, P. D. R. (1952). *An introduction to the Malayan aborigines*. Kuala Lumpur: Government Press.
- Winick, C. (Ed.) (1977) Dictionary of anthropology. Tototwa, N.J.: Littlefield, Adams.
- Wong, K. M. (1995). *The bamboos of Peninsular Malaysia*. Kuala Lumpur: Forest Research Institute Malaysia (FRIM).
- World Health Organisation. (2011). Hypertension fact sheet. *Non communicable diseases*. [Retrieved 11th June, 2012, from

http://www.searo.who.int/linkfiles/non_communicable_diseases_hypertension-fs.pdf]

World Health Organisation. (2012a). Chronic diseases. *Health topics*. [Retrieved 27th June 2012, 2012, from http://www.who.int/topics/chronic_diseases/en/]

World Health Organisation. (2012b). Tuberculosis. [Retrieved 27th June 2012, 2012, from <http://www.who.int/mediacentre/factsheets/fs104/en/index.html>]

Wright, C. I., Van-Buren, L., Kroner, C. I. & Koning, M. M. G. (2007). Herbal medicines as diuretics: a review of the scientific evidence. *Journal of Ethnopharmacology*, *114*(1), 1-31. [doi: 10.1016/j.jep.2007.07.023]

Young, K. J. (2007). *Ethnobotany*. New York, NY: Infobase Publishing.

Zhang, M., Cui, S. W., Cheung, P. C. K. & Wang, Q. (2007). Antitumor polysaccharides from mushrooms: a review on their isolation process, structural characteristics and antitumor activity. *Trends in Food Science & Technology*, *18*(1), 4-19. [doi: 10.1016/j.tifs.2006.07.013]

APPENDICES

Appendix 1: List of questionnaires

1. Is the natural resource used for medicine / food / both / other e.g. custom / spiritual / tradition / etc?
2. What is the name of the natural resource?
3. For what purpose is the natural resource used?
 - a. Medicinally (the name of disease or ailment; description of disease or ailment)
 - b. Food (cooked, used in cooking, or eaten raw)
 - c. Other (ceremony, tradition, custom, economy, etc.)
4. What are the descriptions of the natural resource mentioned?
 - a. Plant (habit; height; structure of leaf, flower, root, stem, fruit, seed; fruiting seasons; surfaces of each part; taste; smell; colour of different plant parts)
 - b. Mushroom (structure and colour of fruiting body – umbrella, stipe, surfaces of each part; the conditions and time it grows; spore; substrate; does it grow on a specific substrate? e.g. specific tree; taste)
 - c. Animal (types of animal e.g. bird, fish, monkey, etc.; colour on different body parts; structure of shell, tail, beak, fin, overall body; size; eating habit; etc.; taste)
5. Which part of the natural resource is used?
 - a. Plant (shoot, inflorescence, flower, young leaf, leaf, stem, bark, wood, root, tuber, rhizome, fruit, seed, inner stem, exudates, pollen, whole)
 - b. Mushroom (fruiting body – umbrella, stipe, sclerotium, whole)
 - c. Animal (meat, horn, quill, fur, casque, leg, eye, head, chick, scale, shell, skin, bone, gall, liver, whole)
6. Is any other part of the species used for the same or different ailment?
7. Where do you usually obtain it?
 - a. Wild (forested area / jungle)
 - b. Cultivated
 - c. Bought at the market place (specifically where?)
8. Is there any specific time to gather the species?
9. How do you prepare the natural resource for the utilization mentioned?
 - a. Medicine (specific amount, preparation, application, and significance of the methods mentioned; intervals for medication)
 - b. Food (cooked or raw; is there any specific steps for preparation; taste)
10. Is there any other natural resource used along with it?
11. Is there any caution or information that should be noted before, during, and after using the natural resource (for the utilization mentioned)?
12. Is there any incantation or spells in using the species for the purpose mentioned? What is the use of the incantation or spell?
13. Is it specifically used for a certain gender or age group? Is there any additional or different procedure for different gender or age group?
14. Is there any other additional information regarding the species or its utilization?

Appendix 2: List of herbarium accession numbers for deposited specimens in University of Malaya Herbarium (KUL)

Specimens	Accession numbers
<i>Alpinia javanica</i> Blume (Zingiberaceae)	KLU047614 KLU047615 KLU047616 KLU047617
<i>Amomum conoideum</i> (Ridl.) Elmer (Zingiberaceae)	KLU047596
<i>Anadendrum</i> sp. (Araceae)	KLU047570
<i>Angiopteris evecta</i> (Forst.) Haffm. (Marattiaceae)	KLU047578 KLU047579
<i>Archidendron bubalinum</i> (Jack) I. C. Nielsen (Fabaceae)	KLU047590
<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae)	KLU047557 KLU047558
<i>Arenga obtusifolia</i> Mart. (Arecaceae)	KLU047639
<i>Champereia manillana</i> (Blume) Merr. (Opiliaceae)	KLU047609 KLU047610
<i>Cheilocostus speciosus</i> (J. König) C. Specht (Costaceae)	KLU047583 KLU047594 KLU047595
<i>Chloranthus officinalis</i> Blume (Chloranthaceae)	KLU047584
<i>Cinnamomum iners</i> Reinw. ex Blume (Lauraceae)	KLU047630
<i>Cnestis palala</i> (Lour.) Merr. (Connaraceae)	KLU047591
<i>Cyathea moluccana</i> R. Br. (Cyatheaceae)	KLU047622
<i>Dianella ensifolia</i> (L.) DC. (Xanthorrhoeaceae)	KLU047621
<i>Didymocarpus platypus</i> C. B. Clarke (Gesneriaceae)	KLU047588 KLU047604 KLU047633
<i>Elattariopsis curtisii</i> Baker (Zingiberaceae)	KLU047569
<i>Elettariopsis</i> sp. (Zingiberaceae)	KLU047585
<i>Embelia</i> sp. (Myrsinaceae)	KLU047601
<i>Erechtites valerianifolia</i> (Link ex Wolf) Less ex. DC. (Asteraceae)	KLU047577
<i>Etlingeria littoralis</i> (J.Köenig) Giseke (Zingiberaceae)	KLU047603
<i>Etlingeria rubrolutea</i> (Baker) C. K. Lim (Zingiberaceae)	KLU047598 KLU047599
<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	KLU047567 KLU047568
<i>Ficus grossularioides</i> Burm.f. (Moraceae)	KLU047625 KLU047626
<i>Ficus obpyramidata</i> King ex Hook.f. (Moraceae)	KLU047582
<i>Ficus variegata</i> Blume (Moraceae)	KLU047623 KLU047624
<i>Flemingia strobilifera</i> (L.) Roxb. (Fabaceae)	KLU047560
<i>Garcinia xanthochymus</i> Hook. f. ex T. Anderson (Clusiaceae)	KLU047612
<i>Globba patens</i> Miq. (Zingiberaceae)	KLU047589 KLU047631
<i>Grewia laurifolia</i> Hook. ex Mast (Tiliaceae)	KLU047581
<i>Helminthostachys zeylanica</i> (L.) Hook. (Ophioglossaceae)	KLU047561

Appendix 2: (continued)

Specimens	Accession numbers
<i>Homalomena sagittifolia</i> Jungh. ex Schott (Araceae)	KLU047575
<i>Labisia pumila</i> (Blume) Fern.-Vill (Myrsinaceae)	KLU047563
	KLU047573
	KLU047574
<i>Leea indica</i> (Burm.f.) Merr. (Vitaceae)	KLU047628
	KLU047629
<i>Mallotus</i> sp. (Euphorbiaceae)	KLU047638
<i>Milletia</i> sp. (Fabaceae)	KLU047611
<i>Murraya</i> sp. (Rutaceae)	KLU047608
<i>Pellacalyx axillaris</i> Korth. (Rhizophoraceae)	KLU047618
	KLU047619
<i>Phyllagathis rotundifolia</i> (Jack) Blume (Melastomataceae)	KLU047587
	KLU047636
	KLU047637
<i>Pinanga malaiana</i> (Mart.) Scheff. (Arecaceae)	KLU047564
	KLU047565
<i>Piper caninum</i> Blume (Piperaceae)	KLU047620
<i>Piper porphyrophyllum</i> N. E. Brown (Piperaceae)	KLU047562
	KLU047607
<i>Pleocnemia irregularis</i> (C. Presl) Holttum (Dryopteridaceae)	KLU047566
	KLU047576
<i>Rhodamnia</i> sp. (Myrtaceae)	KLU047613
<i>Saraca declinata</i> Miq. (Fabaceae)	KLU047600
<i>Scorodocarpus borneensis</i> Becc. (Olacaceae)	KLU047559
	KLU047571
	KLU047572
<i>Smilax myosotiflora</i> A. DC. (Smilacaceae)	KLU047606
<i>Tacca integrifolia</i> Ker Gawl. (Dioscoreaceae)	KLU047592
	KLU047593
<i>Tacca</i> sp. (Dioscoreaceae)	KLU047634
	KLU047635
<i>Trevesia burckii</i> Boerl. (Araliaceae)	KLU047627
<i>Urophyllum</i> sp. (Rubiaceae)	KLU047586
<i>Zingiber spectabile</i> Griff. (Zingiberaceae)	KLU047597

Appendix 3: List of plant species utilized as medicines by the Orang Asli

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)		
1.	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	Pokok nuju (MM)	Leaf	Boils	Pounded and mixed	Applied topically	KP		
				Aches, tuberculosis, pneumonia	Decoction	Drunk	SK		
			Fruit	High fever	Pounded and infused	Drunk	KP		
				Diabetes, brain cancer	Pounded, mixed, sieved	Drunk			
				High fever	Raw	Eaten	KP		
				Uterine and stomach cancer	Raw	Eaten	SK		
			Cancer	Cough (without phlegm)	Stem	Raw	Raw	Eaten	KP, SJ
						Decoction	Decoction	Drunk	SK
						Cut and decocted	Cut and decocted	Drunk	
						Uterine and stomach cancer	Decoction	Drunk	SK
2.	<i>Ageratum conyzoides</i> L. (Asteraceae)	Daun tahi ayam (MM)	Root, stem, leaf	Asthma	Decoction	Drunk	SB		
			Fruit	Cancer	Raw	Eaten	SR		
			Leaf	External wound, boils, abscess from sinusitis complications	Raw	Patched topically	KP		

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
3.	<i>Alocasia longiloba</i> Miq. (Araceae)	Keladi hitam (TM)	Stem's skin	Sprained chicken leg	Parched and skinned	Wrapped topically	G
4.	<i>Aloe vera</i> (L.) Burm. f. (Xanthorrhoeaceae)	Keladi bira hitam (TM) Lidah buaya (MM)	Stem's skin Leaf	Swelling Soften hair and skin	Skinned and parched Mixed	Applied topically Applied topically	BL KP
5.	<i>Alpinia galanga</i> (L.) Willd. (Zingiberaceae)	Sengkuas (TM)	Rhizome	<i>Tinea versicolor</i>	Sliced	Rubbed topically	UK
6.	<i>Alpinia</i> sp. (Zingiberaceae)	Lengkuas (MM)	Rhizome	Shingles, <i>Tinea versicolor</i>	Pounded	Applied topically	SK
7.	<i>Alstonia</i> sp. (Apocyanaceae)	Pokok tepus darah (TM)	Rhizome	Diarrhoea, hematochezia, hematemesis	Decoction	Drunk	SJG
8.	<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Pokok pulai (TM)	Root	Stomach ache	Decoction	Drunk	HT
9.	<i>Amorphophallus</i> sp. 1 (Araceae)	Bayam duri (TM)	Whole	Jaundice	Decoction	Bath	UK
10.	<i>Amorphophallus</i> sp. 2 (Araceae)	Kayu jemali (TM)	Leaf	Wound	Pounded	Applied topically	BL
11.	<i>Anadenantrum</i> sp. (Araceae)	Pokok kelembun (TM) Selempat angin (TM)	Root Whole	Itchiness caused by caterpillars Massage oil	Raw Infused	Swept topically Applied topically	G TAR

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
12.	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees (Acanthaceae)	Hempedu bumi (TM)	Leaf	Hypertension, diabetes	Infused	Drunk	UK
			Root	Diabetes, hematochezia	Decoction	Drunk	UK
		Akar cerita (TM)	Root	Diabetes, hypertension	Decoction	Drunk	BL
13.	<i>Angiopteris evecta</i> (Forst.) Hoffm. (Marattiaceae)	Paku gajah (TM, MM)	Rhizome	Cancer	Decoction of fresh or dried part	Drunk	B
				Ringworm, <i>Tinea versicolor</i>	Dried, pounded, mixed	Applied topically	UK
14.	<i>Archidendron bubalinum</i> (Jack) I. C. Nielsen (Fabaceae)	Pokok kerdas (TM)	Fiddlehead	Boils	Pounded	Applied topically	SJ
			Root	Diabetes	Decoction	Drunk	B, BL, KS
			Seed	Diabetes	Raw	Eaten	TAR
			Unripe seed	Diabetes	Raw	Eaten	BL
15.	<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae)	Pokok jering (TM, MM)	Root	Diabetes	Decoction	Drunk	KA
			Seed	Hypertension, diabetes	Decoction	Drunk	UK
			Pod	Diabetes	Raw	Eaten	UK
16.	<i>Arenga westerhoutii</i> Griff. (Arecaceae)	Pokok abok (TM)	Fibre under leaf sheath	Cleanse blood	Raw	Eaten	SK
			Root	Wound dressing	Raw	Placed topically	HT
17.	<i>Artabotrys</i> sp. (Annonaceae)	Sembelit betina (TM)	Root	Constipation, joint pain, waist pain	Decoction	Drunk	UK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
18.	<i>Artocarpus altilis</i> (Parkinson) Fosberg (Moraceae)	Buah sukun (TM)	Fruit	Boils	Raw	Eaten	KA
19.	<i>Artocarpus heterophyllus</i> Lam. (Moraceae)	Daun nangka (TM)	Leaf	Scabies	Burnt and mixed	Applied	UK
20.	<i>Averrhoa bilimbi</i> L. (Oxalidaceae)	Belimbing buluh (MM)	Shoot	Jaundice	Decoction	Drunk or bath	SB
						Drunk and bath	SK
21.	<i>Averrhoa carambola</i> L. (Oxalidaceae)	Pokok belimbing (TM)	Leaf	Hypertension	Decoction	Drunk	B
		Belimbing besi (TM)	Root	Hypertension, diabetes	Decoction	Drunk	UK
22.	<i>Azadirachta indica</i> Adr. Juss. (Meliaceae)	Daun mambu (TM)	Leaf	Chicken pox	Mashed and mixed	Applied topically	SJG
23.	<i>Bauhinia crudiantha</i> (de Wit) Cusset (Fabaceae)	Akar lejang (TM)	Exudates	Rash on lip	Mixed or raw	Drunk or applied	UK
24.	<i>Blechnum orientale</i> L. (Blechnaceae)	Paku (TM)	Shoot	Swelling, boils	Pounded	Patched topically	G
25.	<i>Calamus</i> sp. (Arecaceae)	Rotan (TM)	Fruit's juice	Provides energy to the body (tonic)	Raw	Drunk	B
26.	<i>Capsicum baccatum</i> var. <i>pendulum</i> (Willd.) Eshb. (Solanaceae)	Pokok lada (TM)	Leaf	Ringworm	Parched, mixed, and pounded	Applied topically	UK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
27.	<i>Carica papaya</i> L. (Caricaceae)	Pokok betik (TM, MM)	Fruit, root	Poison antidote	Raw and decoction	Eaten and drunk	SJG
			Shoot	Aging	Boiled	Eaten	SJ
			Leaf	Hypertension	Decoction	Drunk	SR
28.	<i>Catharanthus roseus</i> (L.) G. Don (Apocyanaceae)	Pokok bunga putih (MM)	Root	Hypertension	Dried, cut, decoction	Drunk	SK
29.	<i>Centella asiatica</i> (L.) Urban (Apiaceae)	Pegaga (MM)	Leaf, stem, root	Hypertension, diabetes	Decoction	Drunk	KP
			Root, leaf	Avoid foul odour lochia (<i>meriyan</i>)	Raw	Eaten	SJ
30.	<i>Cheilocostus speciosus</i> (J.König) C. Specht (Costaceae)	Pokok setawar (TM)	Stem, leaf	Fever, chicken pox	Cut and infused	Drunk	B
			Stem (young)	Antidote for various diseases, high fever	Skinned and pounded	Drunk	KA
		Pokok penduk (TM)	High fever, aches	Mashed	Applied topically	TAR	
				Mashed	Drunk		
			Fever	Pounded and squeezed	Drunk	SJG	
			Diseases antidote	Raw	Eaten	UK	
Antidote	Raw	Drunk	HT				
31.	<i>Chloranthus officinalis</i> Blume (Chloranthaceae)	Pokok nonas (TM)	Leaf	Fever morning and evening (child)	Decoction	Drunk and bath	B
			Root	Fever (child)	Decoction	Drunk	

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
32.	<i>Chromolaena odorata</i> (L.) King & H. E. Robins (Asteraceae)	Pokok kapal terbang (TM)	Leaf	Wound	Mashed	Applied topically	B
		Pokok brunei (MM)	Leaf	Worsen cough, cold	Parched and mixed	Applied topically	SB
33.	<i>Cinnamomum iners</i> Reinw. ex Blume (Lauraceae)	Pokok medang gijo (TM)	Root	Flatulence	Decoction	Drunk	B
		Medang gija (TM)	Bark	Swelling with pustule	Pounded	Applied topically	G
		Medang tijo (TM)	Leaf, root	Muscle stiffness or pain	Cut and cooked	Applied topically	UK
34.	<i>Cinnamomum rhynchophyllum</i> Miq. (Lauraceae)	Pokok lawang (MM)	Bark	Hypertension	Raw or decoction	Eaten or drunk	SK
35.	<i>Cinnamomum</i> sp. (Lauraceae)	Pokok medang (TM)	Fruit	Intestinal worm	Raw	Eaten	TAR
36.	<i>Cleome viscosa</i> L. (Capparaceae)	Bunga maman (TM)	Shoot	Vertigo	Raw	Eaten	UK
37.	<i>Cnestis palala</i> (Lour.) Merr. (Connaraceae)	Pokok akar sembelit (TM)	Root, stem, leaf	Constipation, waist pain	Decoction	Drunk	B
		Sembelit jantan (TM)	Stem	Constipation, joint pain	Decoction	Drunk	UK
38.	<i>Cnestis</i> sp. 1 (Connaraceae)	Kayu kemalau (TM)	Stem	Cough	Decoction	Drunk	BL
39.	<i>Cnestis</i> sp. 2 (Fabaceae)	Akar sembelit (TM)	Twinning stem	Hypertension, diabetes	Decoction	Drunk	UK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)	
40.	<i>Cocos nucifera</i> L. (Arecaceae)	Pokok kelapa (MM)	Fruit's juice (young)	Chicken pox	Mixed	Bath	KP	
			Fruit's juice (young), meat (young)	High fever, chicken pox	Raw	Drunk, bath and applied topically	SK	
		Kelapa mawar (MM) Kelapa muda (TM)	Fruit's juice (young)	High fever	Raw	Drunk	Drunk	KP
			Fruit's juice (young)	Chicken pox	Raw and raw	Drunk and eaten	Drunk	SJ
41.	<i>Coleus scutellarioides</i> (L.) Benth. (Lamiaceae)	Bunga ati-ati (TM)	Leaf	Liver pain	Decoction or raw	Drunk or rubbed	SJG	
42.	<i>Cordyline fruticosa</i> (Agavaceae)	Pokok juang (TM)	Leaf	Ear pain	Parched and squeezed	Instil and stuffed in ear	SJG	
43.	<i>Crinum asiaticum</i> L. (Amaryllidaceae)	Pokok tuasa (TM)	Leaf	Sprained leg	Raw	Wrapped topically	G	
			Pokok bunga seliuh (TM)	Leaf	Sprained	Parched	Wrapped topically	HT
		Pokok bunga bawang (TM)	Leaf	Knee pain	Parched	Parched	Wrapped topically	SJG
			Leaf	Sprained, swelling				SJG, TAR
		Tembaga suasa (TM)	Leaf	Fracture, sprained	Parched	Wrapped topically	UK	

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
44.	<i>Curcuma longa</i> L. (Zingiberaceae)	Kunyit (TM, MM)	Rhizome	Barrenness	Sliced and infused	Drunk	B
				Scabies	Pounded, cooked, mixed	Applied topically	BL
				Internal wound	Pounded or boiled	Drunk	KP
45.	<i>Cyathea moluccana</i> R. Br. (Cyatheaceae)	Pokok paku lebu (TM)	Fiddlehead	Cancer, boils, pustule	Pounded	Patched topically	HT
			Paku lebur/ Paku lebu (TM)	Fiddlehead	Boils	Pounded or thinly sliced	Patched topically
46.	<i>Cyrtandromoea grandis</i> Ridl. (Scrophulariaceae)	Pokok penawar (TM) Pokok bunga (MM)	Leaf	High fever, headache	Pounded	Applied topically	SJG
			Leaf	Headache	Mashed	Applied topically	SK
			Leaf	Fever	Squeezed	Dotted topically	SB
47.	<i>Dianella ensifolia</i> (L.) DC. (Xanthorrhoeaceae)	Pokok bisul (TM)	Fruit	Boils	Raw	Eaten	SJG
			Root	Lochia (<i>meriyan</i>)	Decoction	Drunk	KA
48.	<i>Didymocarpus platypus</i> C. B. Clarke (Gesneriaceae)	Pokok sampuk bercep (TM)	Leaf	High fever	Decoction	Bath	UK
			Root, stem, leaf	Feverish (child)	Decoction	Bath	B

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
49.	<i>Dillenia indica</i> L. (Dilleniaceae)	Pokok sampu (TM)	Fruit	Soften hair	Crushed	Applied topically	TAR
50.	<i>Dillenia</i> sp. (Dilleniaceae)	Pokok jangkang (TM)	Root (young)	Asthma, breathlessness, and cough	Decoction or raw	Drunk or eaten	KS
51.	<i>Dioscorea</i> sp. (Dioscoreaceae)	Akar duri (TM)	Root	Medicine for women	Decoction	Drunk	BL
52.	<i>Donax caniniformis</i> (G. Forst.) K. Schum. (Marantaceae)	Daun bemban (TM)	Fruit (unripe)	Boils	Boiled	Eaten	B
			Fruit	Boils	Raw	Eaten	B, SJG
			Fruit	Boils with pustule	Raw	Eaten	UK
53.	<i>Durio zibethinus</i> Murray (Bombacaceae)	Pokok durian (TM)	Fruit	Boils, heart attack, cancer, swelling	Pounded and infused	Drunk	G
			Root	Boils	Raw	Eaten	KA
54.	<i>Eclipta prostrata</i> (L.) L. (Asteraceae)	Pokok aring-aring (MM)	Leaf	Hypertension, diabetes	Decoction	Drunk	UK
55.	<i>Elatariospermum tapos</i> Blume (Euphorbiaceae)	Pokok buah perah (TM)	Fruit's exudates	Centipede bites	Ground	Applied	SJ
			Leaf	Skin cancer, boils	Raw	Applied topically	B
56.	<i>Elattariopsis curtisii</i> Baker (Zingiberaceae)	Daun semomok (TM)		Cold (flu)	Cooked	Eaten	BL
				Flatulence	Decoction	Drunk	SJG
				Cancer	Leaf	Rubbed with incantation	G
			Root	Diarrhoea	Decoction	Drunk	SJG

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
56.	<i>Elattariopsis curtisii</i> Baker (Zingiberaceae)	Pokok semomok (TM)	Leaf	Haemorrhoids, stomach ache	Decoction	Drunk	TAR
			Root	Diarrhoea, haemorrhoids	Decoction	Drunk	
57.	<i>Erechtites valerianifolia</i> (Spreng.) DC. (Asteraceae)	Bayam terbang (TM)	Stem, leaf	Improve blood circulation	Blanched or raw	Eaten or eaten	KA
		Gebong (TM)	Whole	Delayed walking in children	Decoction	Bath	TAR
58.	<i>Etilingera maingayi</i> (Baker) R. M. Sm. (Zingiberaceae)	Tepus darah (TM)	Rhizome	Lochia (<i>meriyan</i>)	Decoction	Drunk	HT
59.	<i>Etilingera</i> sp. (Zingiberaceae)	Tepus darah (TM)	Rhizome	Diarrhoea (child)	Decoction	Drunk	SJG
60.	<i>Etilingera triorgyalis</i> (Baker) R. M. Smith (Zingiberaceae)	Tepus ubat sakit perut (TM)	Rhizome	Stomach ache	Decoction	Drunk	SJG
61.	<i>Eulophia graminea</i> L. (Orchidaceae)	Bawang hantu (MM)	Bulb	Strengthen body and tonic (during pregnancy)	Sliced or decoction or pounded	Eaten or drunk	KP
62.	<i>Euphorbia nerrifolia</i> L. (Euphorbiaceae)	Bunga penawar (MM)	Leaf	Boils, headache	Pounded	Applied topically	KP
63.	<i>Euphorbia tithymaloides</i> L. (Euphorbiaceae)	Bunga lipan (MM)	Exudates	Centipede bite	Raw	Applied topically	KP
64.	<i>Eurycoma apiculata</i> A. W. Benn. (Simaroubaceae)	Pasak bumi (TM)	Root	Massage oil	Sliced and infused	Applied topically	BL
				Overall health	Decoction	Drunk	

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
65.	<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Tongkat ali (TM, MM)	Root	Medicine for men	Decoction	Drunk	B, BL, G
				Cough			BL
				Hypertension, diabetes			G
				Tonic for men, blood thinner			HT
				Muscle pain, diabetes, hypertension			UK
				Waist pain			KS
				Lassitude, hypertension			TAR
				Tonic for men			SB, SJ
66.	<i>Fagraea obovata</i> Wall. (Loganiaceae)	Akar tengkuk jawak (TM)	Leaf	Tonic for men, blood thinner	Decoction	Drunk	HT
			Leaf, root	Overall health	Decoction	Drunk	UK
67.	<i>Ficus callicarpa</i> Miq. (Moraceae)	Akar biawak (TM)	Root	Asthma, cough	Decoction	Drunk	UK
			Climbing stem	Waist pain, blood thinner	Decoction	Drunk	KS

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)	
68.	<i>Flemingia strobilifera</i> (L.) Roxb. (Fabaceae)	Pokok peringan (TM)	Leaf, flower	Delayed walking in older people and children	Decoction	Bath	B	
			Leaf	Delayed walking in children	Decoction	Drunk	TAR	
		Pokok peringan badan (TM) Pokok pelampung (TM)	Leaf	Delayed walking in children	Decoction	Bath	Bath	HT
			Leaf, flower	Delayed walking in children	Decoction	Bath	Bath	TAR
69.	<i>Globba patens</i> Miq. (Zingiberaceae)	Meriyan air (TM)	Root, stem, leaf	Lochia (<i>meriyan</i>)	Decoction	Drunk	B	
		Meriyan (TM)	Whole	Postpartum	Decoction	Bath	B	
		Tepus pemulih (TM)	Exudates	Mouth ulcer	Raw	Applied topically	UK	
70.	<i>Globba</i> sp. 1 (Zingiberaceae)	Meriyan air (TM)	Leaf, root	Postpartum	Decoction; decoction	Bath; drunk	BL	
71.	<i>Globba</i> sp. 2 (Zingiberaceae)	Meriyan batu (TM)	Leaf	Jaundice	Decoction	Bath		
72.	<i>Globba</i> sp. 3 (Zingiberaceae)	Meriyan darah (TM)	Root	Lochia (<i>meriyan</i>)	Decoction	Drunk	G	
73.	<i>Goniothalamus macrophyllus</i> (Blume) Hook. f. & Thomson (Annonaceae)	Pokok gajah beranak (TM)	Root	Postpartum	Decoction	Drunk	G	
			Root	Induce labour	Decoction	Drunk	BL	

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
74.	<i>Grewia laurifolia</i> Hook. ex Mast (Tiliaceae)	Pokok kepialu (TM)	Stem, leaf	<i>Demam kepialu</i> (typhoid fever)	Decoction	Drunk	B
			Leaf		Mashed	Placed topically	
75.	<i>Helminthostachys zeylanica</i> (L.) Hook. (Ophioglossaceae)	Pokok ubat jerawat (TM)	Pollen	Acne	Raw	Applied topically	HT
		Pokok tunjuk langit (TM)					TAR
76.	<i>Hibiscus rosa-sinensis</i> L. (Malvaceae)	Pokok bunga raya (TM)	Leaf	Induce hair growth, thicken hair	Mashed	Applied topically	B
			Flower	High fever	Infused	Applied topically	SJG
		Bunga raya (MIM)	Shoot	Sore eyes	Infused	Instil in eye	TAR
				Expectoration	Mixed, pounded and mixed with water	Patched topically	SK
77.	<i>Hibiscus rosa-sinensis</i> L. var. <i>alba</i> (Malvaceae)	Bunga raya putih (TM)	Root	Bloated stomach	Boiled with incantation	Drunk	HT

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
78.	<i>Homalomena sagittifolia</i> Jungh. ex Schott (Araceae)	Daun kemoyan (TM)	Leaf	Postpartum	Parched	Wrapped topically	G, KA
				Lochia (<i>meriyan</i>)	Parched	Wrapped topically	HT, SJG
			Rhizome	Itchiness caused by caterpillars	Charred	Rubbed topically	KA
				Swelling, pustule	Cut and parched	Placed topically	SJG
		Rhizome; stem; leaf		Fracture	Charred and pounded (rhizome); grated (stem); raw (leaf)	Mixed (rhizome and stem) and wrapped topically using leaf	KA
					Fever with bloated stomach	Parched	Placed and wrapped topically
		Pokok kemoyang (TM)	Leaf	Aches and swelling (postpartum)	Parched	Placed topically	TAR
					Parched	Wrapped topically	
				Swelling, sprained	Mixed	Applied topically	
				Lochia (<i>meriyan</i>)	Parched	Wrapped topically	

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
79.	<i>Horsfieldia</i> sp. (Myristicaceae)	Pokok mendarah (TM)	Exudates	Lip wound or ulcer	Raw	Applied topically	HT
80.	<i>Hymenocallis speciosa</i> (L.f. ex Salisb.) Salisb. (Amaryllidaceae)	Pokok demam panas (TM)	Leaf	High fever	Decoction	Bath	UK
81.	<i>Imperata cylindrica</i> (L.) Beauv (Poaceae)	Lalang (TM, MM)	Root and runners	Hypertension	Decoction	Drunk	BL, SK
				Diabetes			HT, SK
82.	<i>Indorouchera</i> sp. (Linaceae)	Akar kelait (TM)	Root's water	Antidote	Raw	Drunk	TAR
83.	<i>Ixonanthes icosandra</i> Jack (Ixonanthaceae)	Pokok kayu pagar anak (TM)	Root	Barrenness	Decoction	Drunk	UK
84.	<i>Justicia</i> sp. (Acanthaceae)	Daun tegukur (TM)	Leaf	Abortion	Decoction	Drunk	SJG
85.	<i>Kaempferia galanga</i> L. (Zingiberaceae)	Daun cekur (MM)	Rhizome	Cleanse blood to avoid foul odour (women)	Pounded and squeezed	Drunk	SJ
						Drunk with incantation	KS
86.	<i>Labisia pumila</i> (Blume) Fer.- Vill. (Myrsinaceae)	Akar sembelit (TM)	Root and underground stem	Lochia (<i>meriyan</i>)	Decoction	Drunk	G
			Leaf, root and underground stem	Waist pain	Decoction	Drunk	HT
		Kacip Fatimah/ Meriyan bombong (TM)	Root and underground stem	Tonic (women), postpartum	Decoction	Drunk	B

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
86.	<i>Labisia pumila</i> (Blume) Fer.- Vill. (Myrsinaceae)	Kacip fatimah (TM, MM)	Leaf, root and underground stem	Overall health	Decoction	Drunk	UK
				Swelling (postpartum)	Decoction and decoction	Bath and drunk	UK
			Root and underground stem	Postpartum	Decoction	Drunk	KS
				Expanded vagina (postpartum)	Decoction	Bath	UK
				Hypertension, tonic (women)	Decoction	Drunk	HT
87.	<i>Lasia</i> sp. (Araceae)	Akar segenuali (TM)	Root	Tonic (postpartum)	Decoction	Drunk	SB
				Flatulence, hypertension, and overall health	Decoction	Drunk	UK
				Aging	Comminute and mixed or decoction	Drunk	KP
88.	<i>Lawsonia inermis</i> L. (Lythraceae)	Pokok inai (MM)	Leaf	Rid of waste and impurities in stomach	Decoction	Drunk	SB
				Uterus expansion (postpartum)	Decoction	Drunk	SJ
			Root	Headache	Mashed	Placed topically	SK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
89.	<i>Leea indica</i> Merr. (Vitaceae)	Daun malik (TM)	Leaf or shoot	Fracture	Pounded	Patched topically	B
		Pokok membali/ Pokok memali (TM)	Leaf or shoot	Wound	Pounded or cut	Patched topically or patched topically	UK
90.	<i>Leptaspis urceolata</i> (Roxb.) R.Br. (Poaceae)	Daun bali (TM)	Shoot	Wound	Parched and pounded	Patched topically	G
		Pokok mali-mali (MM)	Bark	Fractured leg	Pounded	Patched topically	SK
91.	<i>Leucaena leucocephala</i> (Lam) de Wit. (Fabaceae)	Meriyan batu (TM)	Leaf	Postpartum	Decoction	Drunk	B
		Pokok petai belalang (TM)	Root	Diabetes	Decoction	Drunk	B
92.	<i>Lophatherum gracile</i> Brongn. (Poaceae)	Rumput banyak anak (TM)	Root (with nodules)	Barrenness	Decoction	Drunk	KA
		Rumput simbah (TM)					SJG
93.	<i>Lygodium salicifolium</i> Presl. (Schizaeaceae)	Pokok ribu-ribu (MM)	Fronde	Chicken pox	Ground	Applied topically	SB
94.	<i>Mallotus</i> sp. (Euphorbiaceae)	Pokok tembung (TM)	Leaf	Nosebleed, nasal congestion	Rolled	Inserted in nostril	UK
95.	<i>Mapania</i> sp. (Cyperaceae)	Mengkluang bantut (TM)	Shoot	Contraceptive (female)	Raw	Eaten	UK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
96.	<i>Melastoma decemfidum</i> Roxb. (Melastomataceae)	Senduduk putih (TM, MM)	Flower, root	Hypertension	Decoction (separately)	Drunk	B
		Kenduduk putih (TM)	Root	Jaundice	Decoction	Drunk	SR
		Senduduk bunga putih (MM)	Flower, root	Diseases antidote	Decoction	Drunk	HT
		Sekodok ungu (MM)	Root Shoot Flower	Hypertension Cough Hypertension, lassitude	Decoction Raw Infused	Drunk Eaten Drunk	SK
97.	<i>Melastoma malabathricum</i> L. (Melastomataceae)	Sekodok ungu (MM)	Root	Wound	Sliced and pounded	Applied topically	KP
98.	<i>Melastoma</i> sp. (Melastomataceae)	Senduduk (MM)	Root	Wound	Decoction	Applied topically	SK
99.	<i>Mikania cordata</i> (Burm. f.) B.L. Robins. (Asteraceae)	Peria hantu (TM)	Leaf	Scabies with pustule, wound	Mashed	Applied or patched topically	TAR
		Akar ulan (TM)	Leaf	Wound	Pounded	Patched topically	UK
		Peria hantu/ Peria hutan (TM)			Mashed	Patched topically	SJG
		Gentam (TM)			Mashed	Applied topically	B

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
100.	<i>Mikania micrantha</i> Kunth (Asteraceae)	Pokok mongol (TM)	Leaf	Ringworm	Mixed and mashed	Applied topically	B
		Peria hantu (TM)	Leaf	Wound	Mashed	Patched topically	KA, SJG
		Akar ulan (TM)	Leaf	Wound	Infused, dried, pounded	Applied topically	BL
		Daun ulan (TM)	Leaf	Wound	Pounded and mixed	Patched topically	UK
101.	<i>Milletia</i> sp. (Fabaceae)	Pokok kabau (TM)	Leaf	Dandruff	Mashed and mixed	Massage topically	SJG
				<i>Tinea versicolor</i> , ringworm	Mashed and rubbed	Rubbed topically	
102.	<i>Mimosa pudica</i> L. (Fabaceae)	Pokok malu (MM)	Root	High fever	Decoction	Drunk	SB
103.	<i>Mitragyna speciosa</i> (Korth.) Havil. (Rubiaceae)	Daun ketum (MM)	Leaf, root, stem	Tonic	Decoction	Drunk	SK
				Centipede bites	Raw	Tied topically	G
104.	<i>Molineria latifolia</i> (Dryand. ex W. T. Aiton) Herb. ex Kurz (Hypoxidaceae)	Pokok lembak (TM)	Shoot Exudates	Ulcer	Raw	Applied topically	UK
105.	<i>Momordica charantia</i> L. (Cucurbitaceae)	Peria katak (MM)	Fruit	Hypertension, diabetes	Fried or raw	Eaten	SJ

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
106.	<i>Morinda citrifolia</i> L. (Rubiaceae)	Pokok mengkudu (MM)	Fruit	Blood cleanser, diabetes, hypertension	Raw	Eaten	KP
				Hypertension, diabetes	Cut or blended, decocted, sieved	Drunk	SJ
			Shoot	Fever, stomach ache	Decoction	Drunk	KP
			Leaf	Fever, stomach ache	Parched	Patched	
	Root	Skin disease	Decoction	Applied topically			
107.	<i>Morinda umbellata</i> L. (Rubiaceae)	Akar pialu (TM)	Root	Cold (flu)	Decoction	Drunk	B
108.	<i>Muntingia calabura</i> L. (Muntingiaceae)	Daun cere (TM)	Leaf	Diabetes	Decoction	Drunk	UK
109.	<i>Musa acuminata</i> Colla (Musaceae)	Pisang abu (TM)	Inflorescence	Congestive heart failure, hypertension	Decoction	Drunk	UK
110.	<i>Musa balbisiana</i> Colla (Musaceae)	Pisang hutan (TM)	Inflorescence	Increase breast milk (lactagogue)	Decoction	Eaten	BL
			Fruit's exudates	Ulcer	Raw	Applied topically	UK
			Fruit's exudates	Mouth ulcer	Raw	Applied topically	SJ
111.	<i>Musa</i> sp. 1 (Musaceae)	Pisang bakar (MM)	Fruit (unripe)	Stomach cancer	Skinned	Eaten	SK
112.	<i>Nypa fruticans</i> Wurmbe (Arecaceae)	Nipah (MM)	Fruit (young) cluster	Diabetes, hypertension	Dried, cut, decoction	Drunk	SK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
113.	<i>Ochanostachys amentacea</i> Mast. (Olacaceae)	Pokok ketaling (TM) Pokok kayu petaling (TM)	Fruit's skin Bark, exudates	Diarrhoea Stomach ache	Skinned and decoction Decoction	Drunk Drunk	KA TAR
114.	<i>Orchidantha longiflora</i> Ridl. (Lowiaceae)	Daun lebak (TM)	Leaf	Dandruff	Pounded	Applied topically	G
115.	<i>Orthosiphon aristatus</i> (Blume) Miq. (Lamiaceae)	Pokok misai kucing (TM, MM)	Leaf	Diabetes Hypertension	Decoction Infused Decoction	Drunk Drunk Drunk	B, SB SJ G
116.	<i>Orthosiphon stamineus</i> Benth (Lamiaceae)	Misai kucing (MM)	Stem, leaf	Feverish	Mashed	Patched topically	SK
117.	<i>Pandanus</i> sp. (Pandanaaceae)	Daun mengkuang ketam (TM)	Leaf Root	Fracture Diarrhoea (child)	Parched Decoction	Wrapped topically Drunk	SJG
118.	<i>Paramignya</i> sp. (Rutaceae)	Cili bukit (TM)	Root	Aches (waist and body)	Decoction or raw	Drunk or eaten	B
119.	<i>Parkia speciosa</i> Hassk. (Fabaceae)	Petai (TM, MM)	Seed Bean pod, seed Root Pod	Diabetes Diabetes Diabetes Hypertension, diabetes Cleanse blood	Raw Raw Decoction Decoction Raw	Eaten Eaten Drunk Drunk Eaten	TAR UK B, SJG UK SK
120.	<i>Peltosanthus</i> sp. (Asparagaceae)	Bawang hutan/ Bawang nujuk (MM)	Fruit	Coughing up blood	Crushed and decoction	Drunk	SK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
121.	<i>Pereskia bleo</i> (Kunth) DC. (Cactaceae)	Pokok bunga berduri (TM)	Leaf	Hypertension, cancer	Blanched or raw	Eaten	KA
		Pokok jarum tujuh bilah (TM)	Flower	Scabies, boils	Pounded	Applied topically	BL
			Leaf	Hypertension, cancer	Decoction	Drunk	BL
		Pokok tujuh jarum (TM)	Leaf Root	Diabetes	Decoction	Drunk	BL, SJG
122.	<i>Phyllanthus rotundifolia</i> (Jack) Blume (Melastomataceae)	Dau kura-kura (TM)	Leaf	Hypertension, diabetes	Decoction	Drunk	UK
		Pokok serau malam (TM)	Root	Stomach ache	Parched	Wrapped topically	G
			Daun semalam (TM)	Root	Fever (night)	Decoction	Drunk
		Pokok cermai (MM)	Root	Overall health	Decoction	Drunk	UK
123.	<i>Phyllanthus acidus</i> (L.) Skeels (Phyllanthaceae)	Pokok cermai (MM)	Leaf	Rash	Mixed and pounded	Applied topically	KP
			Leaf	Stomach ache	Decoction	Drunk	SB
124.	<i>Phyllanthus amarus</i> Schumacher & Thonn. (Phyllanthaceae)	Pokok dukung anak (MM)	Leaf	Diabetes, excess body heat	Decoction	Drunk	SJ
			Leaf, root, stem	Stomach ache	Cut and decocted	Drunk	SK
125.	<i>Phyllanthus niruri</i> L. (Phyllanthaceae)	Dukung anak (MM)	Root	Diarrhoea	Decoction	Drunk	SB
126.	<i>Pinanga malaiana</i> (Mart.) Scheff. (Areaceae)	Pinang legung (TM)	Unripe fruit	Pit viper bite	Pounded	Patched topically	TAR

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)	
127.	<i>Piper betel</i> L. (Piperaceae)	Daun sireh (TM)	Leaf	High fever	Decoction	Drunk	B	
		Daun sirih (TM)	Shoot	Nosebleed	Mashed	Inserted in nostril	SJG	
		Sirih (MM)	Leaf	Feminine hygiene cleanser	Decoction	Used while cleansing	Swept topically	SJ
				Blackout	Ground	Ground		
128.	<i>Piper porphyrophyllum</i> N. E. Brown (Piperaceae)	Sirih hantu (TM)	Leaf	Myopia	Pounded and squeezed	Wrapped topically	G	
				Cracked heel	Parched	Applied topically		
		Sirih murai (TM)	Leaf	Use by midwife for postpartum	Pounded	Drunk	HT	
				Fever, cold	Decoction	Applied topically		
		Sirih hantu/ Sirih rimau (TM)	Leaf	Wound	Pounded	Crushed	Applied topically	UK
				Itchiness	Pounded	Pounded	Applied topically	BL

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
128.	<i>Piper porphyrophyllum</i> N. E. Brown (Piperaceae)	Pokok sirih rimau (TM)	Leaf	Swelling	Decoction	Bath and drunk	KS
			Root	<i>Tinea versicolor</i> , ringworm Ringworm, <i>Tinea versicolor</i>	Mashed Decoction	Dotted topically Bath	SJG
129.	<i>Piper</i> sp. 1 (Piperaceae)	Sirih hutan (TM)	Leaf	<i>Tinea versicolor</i> and ringworm	Mashed	Rubbed topically	TAR
130.	<i>Piper</i> sp. 2 (Piperaceae)	Sirih kalong (MM)	Leaf	Hypertension	Raw	Eaten	UK
131.	<i>Plagiostachys lateralis</i> Ridl. (Zingiberaceae)	Pokok penduk (TM)	Pith	Sore throat	Raw	Eaten	SB
132.	<i>Poikilospermum suaveolens</i> (Blume) Merr. (Cecropiaceae)	Pokok tawan (MM) Akar setiawan (TM)	Root's water	High fever	Pounded	Patched topically	KA
			Root's water	Cough Asthma	Raw	Drunk	SB SJG
133.	<i>Polyalthia bullata</i> King (Annonaceae)	Tongkat ali hitam (TM)	Root and underground stem	Overall health	Decoction	Drunk	BL
				Asthma, diabetes, waist pain, hypertension, constipation, weak body	Decoction	Drunk	UK
134.	<i>Pothos curtisii</i> Hook.f. (Araceae)	Akar resdung (TM)	Root	Sinusitis	Decoction	Drunk	B

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
135.	<i>Psidium guajava</i> L. (Myrtaceae)	Pokok jambu batu (TM, MM)	Bark	Diarrhoea	Decoction	Drunk	B
			Leaf	Diarrhoea	Decoction	Drunk	SJG
			Shoot	Wound, scabies	Decoction	Bath	SR
			Root	Stomach ache	Decoction	Drunk	KP
			Shoot	Stomach ache	Decoction	Drunk	SK
136.	<i>Punica granatum</i> L. (Puniaceae)	Pucuk jambu (TM)	Shoot	Diarrhoea	Decoction	Drunk	BL
			Leaf	Diarrhoea	Decoction	Drunk	TAR
137.	<i>Sansevieria trifasciata</i> Prain (Asparagaceae)	Buah delima (MM)	Fruit (young)	Gout	Raw	Eaten	SK
138.	<i>Santaloides rugosum</i> Kuntze (Connaraceae)	Akar sembelit (TM)	Leaf	Ear inflammation (with pustule)	Cut and parched	Placed and blown in ear	KP
			Root	Waist, backbone aches	Decoction	Drunk	B
			Root	Constipation	Cut and decoction	Drunk	
139.	<i>Scorodocarpus borneensis</i> Becc. (Olacaceae)	Pokok kulim (TM)	Seed	Intestinal worms	Raw	Eaten	HT
					Fried	Eaten	KA
					Roasted	Eaten	SJG
					Roasted or cooked	Eaten	TAR
					Raw	Eaten	TAR
139.	<i>Scorodocarpus borneensis</i> Becc. (Olacaceae)	Pokok kulim (TM)	Seed and leaf	Flatulence	Cooked	Eaten	TAR
					Raw	Eaten	TAR
					Raw	Eaten	TAR
139.	<i>Scorodocarpus borneensis</i> Becc. (Olacaceae)	Pokok kulim (TM)	Root	Waist pain and diarrhoea	Decoction	Drunk	TAR
					Decoction	Drunk	TAR

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
140.	<i>Senna alata</i> (L.) Roxb. (Fabaceae)	Pokok gelengang (MM)	Leaf	<i>Tinea versicolor</i> , skin fungal infection	Mashed	Applied topically	SB
		Daun gelengang (MM)			Pounded	Applied topically	KP
141.	<i>Senna obtusifolia</i> (L.) H. S. Irwin & Barneby (Fabaceae)	Pokok gelengang besar (TM, MM)	Leaf	<i>Tinea versicolor</i>	Mixed and pounded	Applied topically	SK
					Ground and mixed	Applied topically	SJ
142.	<i>Senna tora</i> (L.) Roxb. (Fabaceae)	Gelengang kecil (TM) Daun gelengang kecil (TM)	Leaf	Scabies	Pounded	Applied topically	UK
					Pounded	Applied topically	UK
143.	<i>Smilax myosotiflora</i> A. DC. (Smilacaceae)	Ubi jaga (TM)	Tuber	Ringworm	Crushed and mixed	Applied topically	BL
				Waist pain	Decoction	Drunk	KS
144.	<i>Smilax setosa</i> Miq. (Smilacaceae)	Janggut baung (TM) Terung ulam (MM)	Whole	Fracture, overall health, muscle aches	Decoction	Drunk	UK
				Diabetes, sexual prowess, overall health	Decoction	Drunk	B
145.	<i>Solanum ferox</i> L. (Solanaceae)	Janggut baung (TM) Terung ulam (MM)	Fruit	Tonic for men	Boiled	Eaten	HT
				Poison antidote	Raw	Eaten	KS
				Maintain energy of the body	Mixed and pounded	Eaten	SK

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
146.	<i>Solanum torvum</i> Sw. (Solanaceae)	Terung pipit (MM)	Fruit	Recover body condition	Raw or boiled	Eaten	SK
147.	<i>Sonneratia caseolaris</i> (L.) Engl. (Sonneratiaceae)	Bumbang (MM)	Leaf	Measles	Crushed and mixed	Applied topically	KP
148.	<i>Sonneratia ovata</i> Backer (Sonneratiaceae)	Pokok dabu (MM)	Fruit (white)	Opium or drug addiction	Raw	Eaten	SR
149.	<i>Spilanthes paniculata</i> Wall. ex DC. (Asteraceae)	Bunga sakit gigi (TM)	Flower	Toothache	Pounded	Applied topically	KA
150.	<i>Spondias dulcis</i> Parkinson (Anacardiaceae)	Pokok kedondong (TM)	Fruit	Cough	Raw	Eaten	TAR
151.	<i>Stenochlaena palustris</i> (Burm.f.) Bedd. (Blechnaceae)	Pucuk paku (MM)	Fronde (matured)	Diarrhoea	Boiled or cooked	Drunk	SJ
152.	<i>Styphelia malayana</i> (Jack) Spreng. (Epacridaceae)	Paku merah (MM)	Fronde	Diarrhoea, hypertension, diabetes	Cooked	Eaten	SJ
153.	<i>Syzygium</i> sp. (Myrtaceae)	Pokok perapat (TM)	Stem and leaf	Burn excessive fat (postpartum)	Decoction	Drunk	B
154.	<i>Tacca integrifolia</i> Ker Gawl. (Dioscoreaceae)	Pokok jambu hutan (TM)	Bark	Contraceptive	Decoction	Drunk	B
155.	<i>Tacca</i> sp. (Dioscoreaceae)	Pokok kelembun (TM)	Young leaf	Aches	Decoction	Drunk	KA
156.	<i>Tetracera indica</i> Merr. (Dilleniaceae)	Lebak merah (TM)	Root	Hypertension	Decoction	Drunk	UK
156.	<i>Tetracera indica</i> Merr. (Dilleniaceae)	Akar mempelas/ Sempelas pusung (TM)	Root	Hypertension, diabetes	Decoction	Drunk	B

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
157.	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson (Menispermaceae)	Patawali (MM)	Stem	Stomach ache, fever, diabetes, hypertension, gonorrhoea, intestinal worms, bacterial disinfectant, cleanse blood, wound	Decoction	Drunk	KP
158.	<i>Trevesia burckii</i> Boerl. (Araliaceae)	Pokok kia' (TM)	Root	Aches	Decoction	Bath	UK
159.	<i>Uncaria lanosa</i> Wall. (Rubiaceae)	Akar kait (MM)	Root	Cough, phlegm, asthma	Decoction	Drunk	SB
160.	<i>Uncaria</i> sp. (Rubiaceae)	Gambir melaka (TM)	Leaf (young)	Scabies	Sliced and infused	Patched	TAR
161.	<i>Urophyllum</i> sp. (Rubiaceae)	Pokok penggugur (TM)	Root	Abortion	Decoction	Drunk	B
162.	<i>Vernonia javanica</i> DC. (Asteraceae)	Pokok kepialu (TM)	Leaf	<i>Demam kepialu</i> (typhoid fever)	Mashed and infused	Drunk	B
163.	<i>Zingiber montanum</i> (J. König) Link ex A. Dietr. (Zingiberaceae)	Bonglai (TM)	Rhizome	Seizure, oedema	Sliced and infused	Applied	B
164.	<i>Zingiber officinale</i> Roscoe (Zingiberaceae)	Halia (TM)	Rhizome	Shingles, gout, oedema	Grated with incantation beforehand	Rubbed topically	UK
165.	<i>Zingiber puberulum</i> Ridl. (Zingiberaceae)	Pokok tepus balak (TM)	Exudates	Swellings from accident Tongue ulcer	Sliced Raw	Wrapped topically Applied topically	UK BL

Appendix 3: (continued)

No.	Botanical Name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
166.	<i>Zingiber spectabile</i> Griff. (Zingiberaceae)	Pokok tepus cadak (TM)	Root	High fever	Decoction	Drunk	SJG
		Pokok carak (TM)	Shoot's stem	Feverish	Skinned	Eaten	SJG
			Shoot	Antidote (diseases)	Raw	Eaten after incantation	TAR

Appendix 4: List of mushroom species utilized as medicines by the Orang Asli

No.	Mycological name	Vernacular name	Part(s) used	Ailment(s) or conditions treated	Preparation	Application	Village(s)
1.	<i>Auricularia auricula-judae</i> (Bull.) Quél. (Auriculariaceae)	Cendawan memeh (TM)	Whole	Fever	Charred	Applied topically	UK
		Petih bebek (MM)	Whole	Induce labour, soften skin (pregnant women) Soften skin	Cooked	Eaten	SB
2.	<i>Cookeina speciosa</i> (Fr.) Dennis (Sarcoscyphaceae)	Cendawan mangkuk (TM)	Whole	Nocturnal enuresis	Boiled	Eaten	SK
3.	<i>Cookiema</i> sp. (Sarcoscyphaceae)	Cendawan mangkuk (TM)	Whole	Weaned children	Infused	Drunk	B
4.	<i>Cookiema sulcipes</i> (Berk.) Kuntz (Sarcoscyphaceae)	Cendawan mangkuk (TM)	Whole	Diuretic	Mixed	Fed	B
5.	<i>Coprinus</i> sp. (Agaricaceae)	Cendawan mangkuk (TM)	Whole	Diuretic	Infused	Drunk	B
6.	<i>Ganoderma australe</i> (Fr.) Pat. (Ganodermataceae)	Cendawan kaki satu (TM)	Whole	Itchiness, <i>Tinea versicolor</i>	Pounded	Applied topically	UK
7.	<i>Ganoderma</i> sp. (Ganodermataceae)	Cendawan certing (TM)	Whole	Relieve lung pain	Infused	Applied topically	B
8.	<i>Lignosus rhinocerotis</i> (Cooke) Rywarden (Polyporaceae)	Cendawan dinding (TM)	Whole	Asthma	Decoction	Drunk	BL
		Petih a'a (MM)	Sclerotium	Enhance body strength and physical fitness	Raw	Eaten	SB

Appendix 4: (continued)

No.	Mycological name	Vernacular name	Part(s) used	Ailment(s) or conditions treated	Preparation	Application	Village(s)		
8.	<i>Lignosus rhinocerotis</i> (Cooke) Ryvarden (Polyporaceae)	Cendawan susu harimau (TM)	Sclerotium	Asthma	Decoction	Drunk	BL		
					Grated, dewed, mixed	Drunk	KS		
					Raw	Eaten	SJG		
				High fever, head ache, overall health	Decoction	Drunk	UK		
					Decoction	Drunk	HT		
					Decoction	Drunk	UK		
					Decoction	Drunk	UK		
				Cough, cold	Sclerotium	Cough, cold	Raw	Eaten	HT
							Lactagogue (increase breastmilk)	Applied topically	SJG
							Breathlessness and asthma	Eaten	UK
Aphrodisiac for women	Whole	Cendawan kelentik kering/ Cendawan kerting kering/ Cendawan kerteh kering (TM) Cendawan kering (TM) Cendawan matahari (TM)	Aphrodisiac for women	Infused	Drunk	B			
				Infused	Applied topically				
				Infused	Applied topically				
				Raw	Eaten				
				Decoction	Drunk				
9.	<i>Microporus xanthopus</i> (Fr.) Kuntze (Polyporaceae)	Cendawan matahari (TM)	Whole	Raw	Eaten	KS			
				Decoction	Drunk	HT			

Appendix 4: (continued)

No.	Mycological name	Vernacular name	Part(s) used	Ailment(s) or conditions treated	Preparation	Application	Village(s)
9.	<i>Microporus xanthopus</i> (Fr.) Kuntze (Polyporaceae)	Cendawan pengering (TM)	Whole	Contraceptive and uterus expansion (postpartum)	Mashed and mixed	Applied topically	UK
				Lochia (<i>meriyan</i>), body slimming	Decoction	Drunk	KA
				Lochia (<i>meriyan</i>)	Decoction	Drunk	SJG
10.	<i>Pycnoporus sanguineus</i> (L.) Murrill (Polyporaceae)	Cendawan mata (TM)	Whole	Sore eyes or red eyes	Infused	Applied topically	B
		Cendawan be'reng, Cendawan bereh (TM)		Wound, sore	Charred and mixed	Applied topically	UK
11.	<i>Termitomyces chypeatus</i> R. Heim (Lyophyllaceae)	Cendawan susu pelanduk (TM)	Whole	Lassitude, fever	Cooked	Eaten	UK
12.	<i>Volvvariella volvacea</i> (Bull.) Singer (Pluteaceae)	Cendawan kelapa sawit (MM)	Whole	Poison antidote	Boiled or dried	Eaten	KP
13.	<i>Xylaria polymorpha</i> (Pers.) Grev. (Xylariaceae)	Cendawan harimau (TM)	Liquid inside fruiting body	Asthma, delayed and painful urination, nocturia (excessive urination at night)	Raw	Drunk	KA
		Cendawan kemaluan musang (TM)		Nocturnal enuresis	Mixed	Drunk	TAR
14.	<i>Xylaria</i> sp. (Xylariaceae)	Cendawan punjut (TM)	Liquid inside fruiting body	Diuretic	Raw	Drunk	B

Appendix 5: List of animal species utilized as medicines by the Orang Asli

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
1.	<i>Achatina fulica</i> Ferussac (Achatinidae)	Siput babi (TM, MM)	Meat	Asthma, breathlessness	Boiled Mixed and boiled	Eaten Eaten	UK SK
2.	<i>Atherurus macrourus</i> L. (Hystriidae)	Landak (MM)	Gall	Various illnesses	Dried and infused	Drunk	SR
3.	<i>Apis</i> sp. (Apidae)	Lebah (MM)	Honey	Eye ointment (cleanse eyes from dust)	Raw	Instil in eye	SB
				Decrease stomach ache from internal wound, decrease heartburn	Raw	Drunk	
4.	<i>Callosciurus notatus</i> Boddaert (Sciuridae)	Tupai dalik (TM)	Meat	Health food	Cooked	Eaten	B
5.	<i>Callosciurus prevostii</i> Desmarest (Sciuridae)	Tupai kulit kelapa (MM)	Meat	Asthma	Fried	Eaten	KP
				Joint and arm pain	Fried and mixed	Applied topically	
6.	<i>Centropus bengalensis</i> Gmelin (Cuculidae)	Burung butbut kecil (MM)	Chick	Fracture	Cooked	Applied topically	SR
7.	<i>Centropus rectunguis</i> Strickland (Cuculidae)	Burung butbut (MM)	Newborn chick	Medicated oil for various maladies	Dried and infused	Applied topically	KP
				Fracture	Cooked	Applied topically	SB
8.	<i>Centropus sinensis</i> Stephens (Cuculidae)	Burung tagut/ Gutgut besar (MM)	Newborn chick	Sprained legs, arms, waist	Dried and infused	Applied topically	KP

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
9.	<i>Cervus unicolor</i> Kerr. (Cervidae)	Rusa (MM)	Horn	Boil, peptic ulcer	Filed or filed and infused	Rubbed topically or drunk	SB
10.	<i>Channa gachua</i> Hamilton (Channidae)	Ikam kedap (TM) Ikam (TM)	Meat Meat	Promote healing of post surgery wound Promote healing	Cooked Cooked	Eaten Eaten	B UK
11.	<i>Channa</i> sp. 2 (Ophiocephalidae)	Ikam haruan bujut (TM)	Meat	Promote healing of postpartum, accident, post-surgery	Cooked	Eaten	TAR
12.	<i>Channa</i> sp. 3 (Ophiocephalidae)	Ikam haruan hitam (TM)	Meat	Promote healing of postpartum, accident, post	Cooked	Eaten	TAR
13.	<i>Channa striata</i> Bloch (Ophiocephalidae)	Ikam haruan biasa (TM) Ikam haruan (MM)	Meat Meat Whole	Promote healing of postpartum, accident, post Promote wound healing, induce labour Internal and external wound, waist pain, heals muscle and tissues	Cooked Cooked Cooked	Eaten Eaten Drunk	TAR SB SK
14.	<i>Copsychus malabaricus</i> Scopoli (Muscicapidae)	Murai hutan (MM)	Newborn chick	Fracture	Cooked	Massaged topically	SB

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
15.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Kura-kura mangkuk/ Kura- kura temahang (MM)	Fat	Sprained (legs, arms and waist)	Mixed	Applied or massaged topically	KP
				Burn, sprained, fracture	Cooked	Applied topically	BL
			Fat	Sprained, injuries cramps	Cooked	Massaged topically	SB
				Massage oil for aches, sprained, weak knees and muscle strain	Raw or cooked or infused	Massaged topically	SJ
16.	<i>Dinopium javanense</i> Ljugh (Picidae)	Burung belatuk (TM)	Gall	Massage oil	Raw and mixed	Applied topically	SR
				High fever	Dried and infused	Drunk	SB
			Tongue	Asthma	Raw	Eaten	SJG
			Blood	Warmed body	Raw	Drunk	SJG
17.	<i>Dryocopus javensis</i> Horsfield (Picidae)	Burung belatuk (TM)	Tongue	Asthma	Raw	Eaten	SJG
			Blood	Warmed body	Raw	Drunk	SJG
18.	<i>Felis catus</i> L. (Felidae)	Kucing hitam (MM)	Meat	Yellow fever	Cooked	Eaten	SJ
			Eyeball	Strengthen body	Raw	Swallowed	SJ
19.	<i>Gallus gallus</i> L. (Phasianidae)	Ayam hutan (MM)	Legs	Breathlessness, asthma, diabetes, hypertension	Charred, crushed, decoction	Drunk	SK

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
20.	<i>Helarctos malayanus</i> Raffles (Ursidae)	Beruang (TM)	Gall	Chicken pox	Scraped, parched, mixed	Eaten	KA
21.	<i>Hippocampus</i> sp. (Syngnathidae)	Kuda laut (MM)	Meat	Health food	Boiled	Eaten	SB
22.	<i>Hirundo daurica</i> L. (Hirudinidae)	Layang-layang (TM)	Nest	Cramp, numbness	Decoction	Drunk	KA
23.	<i>Hylobates lar</i> L. (Hylobatidae)	Ungka (TM)	Liver	Asthma	Dried, scraped, infused	Drunk	B
					Fried, dried, pounded, infused	Drunk	BL
24.	<i>Hystrix brachyura</i> L. (Hystriidae)	Landak biasa (TM)	Quill (white part)	Asthma, breathlessness	Charred, mixed	Drunk	BL
		Landak (TM)	Quill (black part)	Breathlessness	Charred, mixed	Applied topically	UK
			Meat	High fever	Cooked	Eaten	UK
25.	<i>Irmengardia pilosimana</i> Roux (Gecarcinucidae)	Ketam imai (MM)	Meat	Asthma	Cooked	Eaten	SB
26.	<i>Lepidochelys olivacea</i> Eschscholtz (Cheloniidae)	Kura-kura (MM)	Fat	Joint pain	Dried, sieved, cooked	Applied topically	SK
27.	<i>Monopterus albus</i> Zuiew (Synbranchidae)	Belut (MM)	Meat	Induce labour	Cooked	Eaten	SB
28.	<i>Muntiacus muntjak</i> Zimmermann (Cervidae)	Kijang (TM)	Horn	Asthma	Filed, soaked, sieved	Drunk with incantation	KA

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)	
29.	<i>Naemorhedus sumatraensis</i> Bechstein (Bovidae)	Kambang gurun (TM)	Fat in head	Massage oil, wound	Cooked	Applied topically	BL	
		Kukang (TM)	Fur	Wound	Raw	Placed topically	B	
			Bones	Wound	Filed	Placed topically	G	
30.	<i>Nycticebus coucang</i> Boddaert (Loridae)	Kongkang (TM, MM)	Fur	Wound	Raw	Placed topically	BL, G, TAR, KP	
			Whole (without fur)	Strengthen body	Prepared	Applied topically	BL	
		Kokang (TM)	Fur	Wound	Raw	Placed topically	Placed topically	KA, UK
			Underarm hair	Wound	Raw	Raw	Placed topically	SJG
			Bones	Wound	Filed	Placed topically	Placed topically	KA, SJG, UK
31.	<i>Paratrypauchen microcephalus</i> Bleeker (Gobiidae)	Tilan (MM)	Meat	Induce labour	Cooked	Eaten	SB	
32.	<i>Periophthalmus</i> sp. (Gobiidae)	Ikan tembakul (MM)	Meat	Asthma	Roasted, fried, cooked	Eaten	SB	
				Increase the ability for a child to walk in the early walking stage	Cooked	Eaten		
33.	<i>Picus puniceus</i> Horsfield (Picidae)	Burung belatuk (TM)	Tongue	Asthma	Raw	Eaten	SJG	
			Blood	Warmed body	Raw	Drunk		
34.	<i>Pisodonophis cancrivorus</i> Richardson (Ophichthidae)	Ikan malung (MM)	Meat	Increase strength	Dried	Applied topically	SB	

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
35.	<i>Prebystis</i> sp. (Cercopithecidae)	Lotong (MM)	Meat	Enhance body resistance	Cooked	Eaten	SB
36.	<i>Pteropus vampyrus</i> L. (Pteropodidae)	Keluang (TM)	Meat	Asthma	Boiled	Eaten or drunk	B
37.	<i>Python brongersmai</i> Stull (Boidae)	Ular ipong/ Ular tesang (TM)	Meat	Cold	Skinned, cut, mixed, boiled	Eaten	UK
				Chicken pox	Parched and infused	Drunk and swallowed	KA
				Tuberculosis	Raw	Swallowed	SJG
				Chicken pox, fever, jaundice, enhance body immunity	Dried and infused	Drunk	SB
			Gall	Fever	Dried and infused	Drunk	SJ
				Asthma, chicken pox, jaundice	Dried and infused	Drunk	SR
				Measles	Infused	Drunk	KP
				Chicken pox, malaria	Dried and infused	Drunk	KP
			Meat	Strengthen body, overall health	Cooked	Eaten	SJ
				High fever	Cooked	Eaten	SB
			Fat	Cramps, sprained	Cooked	Massage topically	SB
38.	<i>Python reticulatus</i> Schneider (Boidae)	Ular sawa (TM, MM)					

Appendix 5: (continued)

No.	Zoological name	Vernacular name	Part(s) used	Ailment(s) or condition(s) treated	Preparation	Application	Village(s)
38.	<i>Python reticulatus</i> Schneider (Boidae)	Tijau (MM)	Meat Gall	Asthma Malaria	Cooked Dried and infused	Eaten Drunk	SK
39.	<i>Ratufa bicolor</i> Sparrmann (Scuridae)	Tupai mengas (TM)	Liver	Breathlessness	Dried	Eaten	UK
40.	<i>Scolopendra</i> sp. (Scolopendridae)	Lipau (MM)	Body	Millipede poison Asthma	Rubbed Roasted	Applied topically Eaten	SB
41.	<i>Scolopendra subspinipes</i> Leach ssp. <i>dehaani</i> (Scolopendridae)	Lipau api (TM)	Meat	Asthma, breathlessness	Roasted, skinned	Eaten	UK
42.	<i>Scylla</i> sp. (Portunidae)	Ketam gedeng (MM)	Shell	Asthma	Charred, pounded, and infused	Drunk	SK
43.	<i>Stichopus horrens</i> Selenka (Holothuroidea)	Lintah laut (MM)	Mucous Meat	Health food Medicated oil	Raw Fried	Eaten Various applications	KP
44.	<i>Termes</i> sp. (Termitidae)	Sarang anai-anai (TM)	Nest	Barrenness	Mixed	Applied topically	UK
45.	<i>Tomistoma schlegelii</i> Müller (Gavialidae)	Buaya (TM)	Fat	Fracture	Cooked	Applied topically	BL
46.	<i>Varanus salvator</i> Laurenti (Varanidae)	Biawak (MM)	Meat	Waist pain	Cooked	Eaten	SJ
47.	<i>Varanus</i> sp. (Varanidae)	Biawak (TM)	Fat	Burn	Raw	Applied topically	KA

Appendix 6: List of plant species utilized for consumption by the Orang Asli

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
1.	<i>Abelmoschus esculentus</i> (L.) Moench (Malvaceae)	Bendi (TM)	Fruit	Eaten	Cooked	TAR
2.	<i>Alocasia longiloba</i> Miq. (Araceae)	Keladi hitam (TM)	Stem	Eaten	Cooked	G, TAR
		Keladi bira hitam (TM)	Stem	Eaten	Cooked	BL
		Keladi batang hitam/ Keladi (TM)	Stem	Eaten	Cooked	TAR
			Rhizome	Eaten	Cooked	TAR
3.	<i>Alocasia</i> sp. (Araceae)	Keladi/ Keladi batang hijau (TM)	Stem	Eaten	Cooked	TAR
		Tepus (TM)	Rhizome	Eaten	Cooked	TAR
4.	<i>Alpinia javanica</i> Blume (Zingiberaceae)	Tepus bunga/ Tepus buah kanang/ Tepus buah di hujung (TM)	Fruit	Eaten	Raw	SJG
						B
5.	<i>Alpinia petiolata</i> Baker (Zingiberaceae)	Pokok mengkanang (TM)	Fruit	Eaten	Raw	TAR
6.	<i>Amaranthus dubius</i> Mart. ex Thellung (Amaranthaceae)	Bayam (TM, MM)	Leaf, stem	Eaten	Cooked	TAR
			Leaf			KP
7.	<i>Amaranthus</i> sp. (Amaranthaceae)	Pucuk bayam (TM)	Shoot	Eaten	Cooked	G
8.	<i>Amomum conoideum</i> (Ridl.) Elmer (Zingiberaceae)	Tepus susu (TM)	Fruit	Eaten	Raw	KA, TAR
9.	<i>Anacardium occidentale</i> L. (Anacardiaceae)	Gajus (MM)	Shoot	Eaten	Raw	SR
10.	<i>Angiopteris evecta</i> (Forst.) Hoffm. (Marattiaceae)	Paku gajah (TM)	Young frond	Eaten	Cooked	B
11.	<i>Archidendron bubalinum</i> (Jack) I. C. Nielsen (Fabaceae)	Pokok kerdas (TM)	Seed	Eaten	Cooked	BL, TAR
			Shoot	Eaten	Raw	B, BL, UK, B

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
12.	<i>Archidendron jiringa</i> (Jack) I. C. Nielsen (Fabaceae)	Pokok jering (TM)	Seed	Eaten	Cooked	B, BL, HT
			Seed	Eaten	Raw	BL, KA, TAR, UK
13.	<i>Ardisia</i> sp. 1 (Myrsinaceae)	Jering (MM)	Seed	Eaten	Cooked	SK
14.	<i>Ardisia</i> sp. 2 (Myrsinaceae)	Pokok mepenai (TM)	Fruit	Eaten	Raw	TAR
		Pokok mensia/ Geranap/ Mensia batu (TM)	Fruit	Eaten	Raw	TAR
15.	<i>Areca catechu</i> L. (Arecaceae)	Pokok pinang (TM)	Palm cabbage	Eaten	Cooked	BL
			Seed	Eaten	Raw	HT, KA, TAR
			Seed	Eaten	Raw	SB
16.	<i>Arenga obtusifolia</i> Mart. (Arecaceae)	Pokok langkap (TM)	Palm cabbage	Eaten	Raw	HT
17.	<i>Arenga pinnata</i> (Wurmb) Merr. (Arecaceae)	Pokok ketu/ Ketor (TM)	Palm cabbage	Eaten	Cooked	B, HT, KA, SJG, TAR
			Palm cabbage	Eaten	Cooked	TAR
18.	<i>Artocarpus heterophyllus</i> Lam. (Moraceae)	Nangka (MM, TM)	Fruit	Eaten	Raw	SR
			Young fruit	Eaten	Cooked	TAR
19.	<i>Artocarpus lanceifolius</i> Roxb. (Moraceae)	Pokok keledang (TM)	Fruit (flesh)	Eaten	Raw	BL
			Seed	Eaten	Cooked	
20.	<i>Artocarpus rigidus</i> Blume (Moraceae)	Buah temponek (TM)	Fruit (flesh)	Eaten	Raw	UK
			Seed	Eaten	Cooked	
21.	<i>Artocarpus integer</i> var. <i>silvestris</i> Corner (Moraceae)	Pokok bangkung/ Cempedak hutan (TM)	Seed	Eaten	Cooked	BL
		Pokok bangkung (TM)	Seed	Eaten	Cooked	TAR
22.	<i>Averrhoa bilimbi</i> L. (Oxalidaceae)	Belimbing buluh (MM)	Fruit	Eaten and used in cooking	Raw	SB

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
23.	<i>Averrhoa carambola</i> L. (Oxalidaceae)	Pokok belimbing (TM) Belimbing besi (TM)	Fruit	Eaten	Raw	B UK
24.	<i>Avicennia lanata</i> Ridley (Avicenniaceae)	Pokok api-api (MM)	Fruit	Eaten	Cooked	KP
25.	<i>Baccaurea bracteata</i> Müll. Arg. (Phyllanthaceae)	Rambai cicit (TM)	Fruit	Eaten	Raw	UK
26.	<i>Baccaurea lanceolata</i> (Miq.) Müll. Arg. (Phyllanthaceae)	Asam pahung (TM)	Fruit	Eaten	Cooked	TAR
			Fruit	Used in cooking	Raw	
			Fruit	Eaten	Cooked	KA
			Fruit's skin	Used in cooking	Raw	BL
27.	<i>Baccaurea macrocarpa</i> (Miq.) Müll. Arg. (Phyllanthaceae)	Buah pahung (TM) Pokok tampoi (TM)	Fruit's skin	Used in cooking	Raw	UK
			Fruit	Eaten	Raw	BL
28.	<i>Baccaurea parviflora</i> (Müll. Arg.) Müll. Arg. (Phyllanthaceae)	Buah taban (TM) Rambai tambun (TM) Pokok tambun (TM) Rambai pacat (TM)	Fruit	Eaten	Raw	KA
			Fruit	Eaten	Cooked	UK
			Leaf	Used in cooking	Raw	
			Fruit	Eaten	Raw	TAR
29.	<i>Baccaurea</i> sp. (Phyllanthaceae)	Rambai pacat (TM)	Fruit	Eaten	Raw	UK
30.	<i>Barringtonia racemosa</i> (L.) Spreng. (Lecythidaceae)	Pucuk putat (TM)	Shoot	Eaten	Raw	BL
31.	<i>Bouea macrophylla</i> Griff. (Anacardiaceae)	Asam kundang (MM)	Fruit	Eaten	Raw	SB
32.	<i>Capsicum frutescens</i> L. (Solanaceae)	Cili api (MM)	Shoot	Eaten	Cooked	SK

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
33.	<i>Carica papaya</i> L. (Caricaceae)	Pokok betik (TM, MM)	Shoot	Eaten	Raw	SJG
			Young fruit	Eaten	Cooked	B, TAR, KP, SR, SJ, SK
			Fruit	Eaten	Cooked	TAR
34.	<i>Caryota mitis</i> Lour. (Arecaceae)	Pokok tukas (TM)	Palm cabbage	Eaten	Cooked or raw	SJ
35.	<i>Castanopsis</i> sp. (Fagaceae)	Pokok berangan (TM)	Fruit	Eaten	Cooked	TAR
36.	<i>Centella asiatica</i> (L.) Urban (Apiaceae)	Daun gaga/ Pegaga (MM)	Leaf	Eaten	Raw or cooked	SJ
			Whole			KP, SK
			Leaf	Eaten	Raw	SB
37.	<i>Champereia manillana</i> (Blume) Merr. (Opiliaceae)	Pucuk cemperai (TM)	Shoot	Eaten	Cooked	B, G, TAR
			Leaf	Used in cooking	Raw	BL
			Shoot	Eaten	Cooked	HT, SJG, TAR
38.	<i>Cinnamomum zeylanicum</i> Blume (Lauraceae)	Kayu manis (MM)	Shoot	Eaten	Cooked	B
			Shoot	Eaten	Cooked	UK
			Shoot	Eaten	Raw	SJ
39.	<i>Citrus aurantiifolia</i> (Christm.) Swingle (Rutaceae)	Limau nipis (TM)	Juice	Used in cooking	Raw	B
			Drinks	Drunk	Raw	
40.	<i>Claoxylon longifolium</i> (Blume) Endl. ex Hassk. (Euphorbiaceae)	Pucuk salak (TM)	Shoot	Eaten and used in cooking	Raw	BL

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
41.	<i>Cocos nucifera</i> L. (Arecaceae)	Pokok kelapa (TM)	Palm cabbage	Eaten	Cooked	BL, TAR
			Young fruit juice	Drunk	Raw or cooked	HT
		Kelapa (MM)	Young fruit juice	Drunk	Raw	UK
			Matured fruit meat	Used in cooking	Raw	KP
42.	<i>Colocasia esculenta</i> (L.) Schott. (Araceae)	Kelapa mawar (MM)	Palm cabbage	Eaten	Cooked	KP, SJ, SK
			Young fruit juice	Drunk	Raw	SB
			Young fruit meat	Eaten	Raw	
43.	<i>Colocasia</i> sp. (Araceae)	Keladi udang (TM)	Stem	Eaten	Cooked	TAR
			Stem	Eaten	Cooked	TAR
44.	<i>Cosmos caudatus</i> Kunth (Asteraceae)	Ulam raja (TM, MM)	Leaf	Eaten	Cooked	TAR, SJ
			Shoot	Eaten	Cooked	SK
			Leaf	Eaten	Raw	KA
45.	<i>Cucurbita moschata</i> (Duchesne ex Lam.) Duchesne ex Poir (Cucurbitaceae)	Labu (TM, MM)	Leaf	Eaten	Cooked	KP
			Shoot	Eaten	Raw	B, SK
45.	<i>Cucurbita moschata</i> (Duchesne ex Lam.) Duchesne ex Poir (Cucurbitaceae)	Labu (TM, MM)	Shoot	Eaten	Cooked	TAR
			Fruit	Eaten	Cooked	KP

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
46.	<i>Curcuma longa</i> L. (Zingiberaceae)	Kunyit (TM, MM)	Rhizome	Used in cooking Eaten	Raw Raw	B, HT KP
47.	<i>Davallia denticulata</i> (Burm.f.) Mett. Ex Kuhn (Davalliaceae)	Paku hutan (TM)	Leaf	Used in cooking	Raw	HT
48.	<i>Dendrocalamus asper</i> (Schultes f.) Backer ex Heyne (Poaceae)	Buluh betong (TM, MM) Buluh betung (TM)	Shoot	Eaten	Raw or cooked	SJG
49.	<i>Dillenia indica</i> L. (Dilleniaceae)	Pokok sampu (TM)	Shoot	Eaten	Cooked	B, BL, SJ, SB TAR
50.	<i>Diplazium esculentum</i> (Retz.) Sw. (Dryopteridaceae)	Pokok sampu (TM)	Leaf	Eaten	Raw	TAR
		Pucuk paku (TM, MM)			Raw or cooked	BL
		Paku padang (TM)	Young frond	Eaten	Cooked	B, HT, SK
		Pucuk paku/ Paku padang (TM)				KA, TAR
		Pokok tanjung (MM)				UK
Tanjung/ Paku hijau (MM)				KP, SJ SB		
51.	<i>Donax canniiformis</i> (G. Forst.) K. Schum. (Marantaceae)	Daun bemban (TM, MM)	Fruit	Eaten	Raw	B, SB
52.	<i>Durio zibethinus</i> Murray (Bombacaceae)	Pokok durian (TM)	Fruit	Eaten	Raw	HT, UK
53.	<i>Eichhornia crassipes</i> (Mart.) Solms (Ponterideriaceae)	Kembayau (TM)	Shoot, stem, leaf	Eaten	Cooked	TAR
54.	<i>Elaeis guineensis</i> Jacq. (Arecaceae)	Kelapa sawit (MM)	Palm cabbage	Eaten	Cooked	KP, SB
		Kelapa bali (MM)	Palm cabbage	Eaten	Cooked	SK
55.	<i>Elateriospermum tapos</i> Blume (Euphorbiaceae)	Pokok perah/ Buah perah (TM)	Seed	Used in cooking	Cooked (smoked)	HT, TAR

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
56.	<i>Elattariopsis curtisii</i> Baker (Zingiberaceae)	Kari hutan/ Daun semomok (TM)	Leaf	Used in cooking	Raw	BL
		Semomok (TM)	Leaf	Used in cooking	Raw	B
		Pokok semomok (TM)	Leaf	Used in cooking	Raw	BL, TAR
				Eaten and used in cooking	Raw	HT
57.	<i>Eleiodoxa conferta</i> (Griff.) Burret (Arecaceae)	Daun semomok (TM)	Leaf	Used in cooking	Raw	G, SJG
		Asam kelubi (TM, MM)	Fruit	Eaten	Raw	TAR, SB
58.	<i>Embelia</i> sp. (Myrsinaceae)	Ubat demam (TM)	Fruit	Eaten	Raw	SB, SJ
		Pokok (TM)	Leaf	Used in cooking	Raw	KA
59.	<i>Erechtites valerianifolia</i> (Link ex Wolf) Less ex. DC. (Asteraceae)	Bayam layar (TM)	Leaf, stem	Eaten	Cooked	B
		Bayam terbang (TM)	Leaf	Eaten	Cooked	KA
		Pokok gabong (TM)	Leaf, whole	Eaten	Cooked	TAR
60.	<i>Etilingera elatior</i> (Jack) R. M. Sm. (Zingiberaceae)	Bunga kantan (TM)	Flower	Used in cooking	Raw	G
61.	<i>Etilingera littoralis</i> (J. König) Giseke (Zingiberaceae)	Tepus kancil (TM)	Fruit	Eaten	Raw	HT
62.	<i>Etilingera rubrolutea</i> (Baker) C. K. Lim (Zingiberaceae)	Tepus tungku (TM)	Fruit	Eaten	Raw	HT
		Tepus merah (TM)	Fruit	Eaten	Raw	SJG
63.	<i>Etilingera</i> sp. (Zingiberaceae)	Tepus padi/ Tepus biasa (TM)	Fruit	Eaten	Raw	HT
		Pokok tepus padi (TM)				KA, TAR
64.	<i>Etilingera triorgyalis</i> (Baker) R. M. Sm. (Zingiberaceae)	Tepus susu (TM)	Fruit	Eaten	Cooked	HT
65.	<i>Eulophia graminea</i> L. (Orchidaceae)	Bawang hantu (MM)	Bulb	Eaten	Raw or cooked	KP

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
66.	<i>Euodia ridleyi</i> Hochr. (Rutaceae)	Pokok setenggek burung (MM)	Shoot	Eaten	Raw	SJ
67.	<i>Ficus grossularioides</i> Burm.f. (Moraceae)	Pokok jemantung (TM)	Ripe fruit	Eaten	Raw	SJG
			Unripe fruit	Eaten	Cooked	
68.	<i>Ficus obpyramidata</i> King ex Hook.f. (Moraceae)	Pokok kelempong (TM)	Shoot's stem	Eaten	Raw	B, TAR
			Fruit	Eaten	Raw	SJG
69.	<i>Ficus variegata</i> Blume (Moraceae)	Buah klepong (TM)	Shoot's stem	Eaten	Raw	SJG
70.	<i>Garcinia nervosa</i> Miq. (Clusiaceae)	Asam kandis (TM)	Leaf	Used in cooking	Raw	UK
			Fruit	Eaten	Raw	
71.	<i>Garcinia urophylla</i> Scott. ex King (Clusiaceae)	Buah kandis (TM)	Fruit	Eaten and used in cooking	Raw	BL
			Fruit	Eaten and used in cooking	Raw	SB
72.	<i>Garcinia xanthochymus</i> Hook. f. ex T. Anderson (Clusiaceae)	Asam kandis (TM)	Fruit	Eaten	Raw	SJG
			Fruit	Shoot	Used in cooking	
73.	<i>Gigantochloa levis</i> (Blanco) Merr. (Poaceae)	Buluh padi (TM)	Shoot	Eaten	Cooked	TAR
74.	<i>Gigantochloa scortechinii</i> Gamble (Poaceae)	Buluh china (TM)	Shoot	Eaten	Cooked	BL
			Buluh leman (TM)	Eaten	Cooked	SJG
75.	<i>Gigantochloa wrayi</i> Gamble (Poaceae)	Buluh manis (TM)	Shoot	Eaten	Cooked	SJG, TAR
76.	<i>Helminthostachys zeylanica</i> (L.) Hook. (Ophioglossaceae)	Pokok tunjuk langit (TM)	Fruond	Eaten	Cooked	HT

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
77.	<i>Hevea brasiliensis</i> (Willd. ex A. Juss.) Müll. Arg. (Euphorbiaceae)	Pucuk getah (TM)	Shoot	Eaten	Raw	BL
		Buah getah/ Pokok getah (TM)	Seed	Used for cooking	Cooked	TAR
78.	<i>Holttumochloa magica</i> (Ridley) K.M. Wong (Poaceae)	Buluh perindu (MM)	Shoot	Eaten	Cooked	KP
79.	<i>Homalomena sagittifolia</i> Jungh. ex Schott (Araceae)	Pokok kemoyang (TM)	Leaf	Eaten	Cooked	TAR
80.	<i>Ipomea aquatica</i> Forssk. (Convolvulaceae)	Leaf, stem	Leaf, stem	Eaten	Cooked	TAR
		Leaf	Leaf	Eaten	Cooked	SJ
81.	<i>Ipomea batatas</i> (L.) Lam. (Convolvulaceae)	Tuber	Tuber	Eaten	Cooked	HT
		Leaf	Leaf	Eaten	Cooked	SJ
82.	<i>Leea indica</i> (Burm.f.) Merr. (Vitaceae)	Keledek (MM)	Shoot	Eaten	Cooked	SK
		Pokok memali (TM)	Leaf	Eaten	Cooked	UK
83.	<i>Leucaena leucocephala</i> (Lam) de Wit. (Fabaceae)	Pokok petai belalang (TM)	Seed	Eaten	Raw or cooked	B
		Pokok kipas (TM)	Fruit	Eaten	Raw	UK
84.	<i>Licuala longipes</i> Griff. (Arecaceae)	Petola (TM, MM)	Shoot	Eaten	Cooked	TAR
		Buluh padi (TM)	Fruit	Eaten	Cooked	KP
85.	<i>Luffa acutangula</i> (L.) Roxb. (Cucurbitaceae)	Asam pelam (MM)	Shoot	Eaten	Cooked	SJG
		Ubi kayu (TM, MM)	Fruit	Eaten	Raw	KP
86.	<i>Maclurochloa montana</i> (Ridl.) K. M. Wong (Poaceae)	Pokok ubi/ Pucuk ubi (TM)	Tuber	Eaten	Cooked	HT, SB
		Pokok ubi/ Pucuk ubi/ Ubi kayu (MM)	Shoot	Eaten	Cooked	SB
87.	<i>Manihot esculenta</i> Crantz (Euphorbiaceae)	Pokok ubi/ Pucuk ubi (TM)	Shoot	Eaten	Cooked	TAR
		Pokok ubi/ Pucuk ubi/ Ubi kayu (MM)	Shoot	Eaten	Cooked	SJ

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
88.	<i>Manihot esculenta</i> Crantz (Euphorbiaceae)	Pucuk ubi (TM, MM)	Shoot	Eaten	Raw Cooked Raw or cooked	B, KA, SB, SK, SR G, HT, KP, SB, SK UK, BL
89.	<i>Melicope</i> sp. (Rutaceae)	Pokok tenggek burung (TM, MM)	Tuber	Eaten	Cooked	B, BL, KA, UK, SK, SR
90.	<i>Mikania cordata</i> (Burm.f.) B. L. Rob. (Asteraceae)	Peria hutan (MM)	Shoot Fruit	Eaten Eaten	Raw Cooked Cooked Cooked or raw	BL SJ SB
91.	<i>Molineria latifolia</i> (Dryand. ex W. T. Aiton) Herb. ex Kurz (Hypoxidaceae)	Pokok lembak (TM, MM) Lembak gajah (TM) Pucuk lembak (TM)	Fruit	Eaten	Raw	G, HT, TAR, SB SJK B
92.	<i>Momordica charantia</i> L. (Cucurbitaceae)	Peria katak (MM) Peria tikus/ Peria hutan (MM)	Fruit	Eaten	Cooked Raw	SJ SK
93.	<i>Morinda citrifolia</i> L. (Rubiaceae)	Pokok mengkudu (MM)	Fruit Shoot	Eaten	Raw	KP
94.	<i>Murraya</i> sp. (Rutaceae)	Kari hutan (TM)	Leaf	Used in cooking	Raw	SJK
95.	<i>Musa acuminata</i> Colla (Musaceae)	Pisang abu (TM, MM)	Inflorescence	Eaten	Cooked or raw Cooked	UK SJ
96.	<i>Musa acuminata</i> x <i>balbisiana</i> Colla cv. 'Pisang Awak' (Musaceae)	Pisang awak (MM)	Pith Inflorescence Pith	Eaten Eaten Eaten	Cooked Cooked Cooked	SJ KP, SJ SJ

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
97.	<i>Musa balbisiana</i> Colla (Musaceae)	Pisang cebok (TM)	Inflorescence	Eaten	Raw or cooked	B
		Pisang jai (TM)	Inflorescence	Eaten	Cooked	HT
		Pisang hutan/ Pisang jai (TM)	Inflorescence	Eaten	Cooked	TAR
			Pith	Eaten	Cooked	
		Pisang top/ Pisang hutan (MM)	Inflorescence	Eaten	Cooked	SB
	Pith	Eaten	Cooked			
98.	<i>Musa nana</i> Lour. (Musaceae)	Pisang serendah (TM)	Fruit	Eaten	Raw	KS
99.	<i>Musa</i> sp. 1 (Musaceae)	Pisang bakar (MM)	Fruit	Eaten	Raw	SK
100.	<i>Musa</i> sp. 2 (Musaceae)	Pisang tok (TM)	Inflorescence	Eaten	Cooked	HT
101.	<i>Musa</i> sp. 3 (Musaceae)	Pisang berangan (MM)	Inflorescence	Eaten	Cooked	KP
102.	<i>Nephelium lappaceum</i> L. (Sapindaceae)	Rambutan (TM)	Fruit	Eaten	Raw	HT
103.	<i>Nypa fruticans</i> Wurm (Arecaceae)	Nipah (MM)	Fruit	Eaten	Raw	KP, SB, SJ, SR
			Unripe fruit	Eaten	Raw	SJ
		Flower	Eaten	Raw	SJ, SR, SB	
		Palm cabbage	Eaten	Raw	SJ	
104.	<i>Ochanostachys amentacea</i> Mast. (Olacaceae)	Pokok ketaling (TM)	Fruit	Eaten	Cooked	KA
		Pokok kayu petaling (TM)				TAR
105.	<i>Oenanthe javanica</i> (Blume) DC. (Apiaceae)	Pucuk minyak gas (TM)	Shoot	Eaten	Raw	SJG
		Pucuk tangki (TM)			Cooked or raw	UK
		Daun selom (MM)	Leaf	Eaten	Raw	SK
106.	<i>Oncosperma horridum</i> (Griff.) Scheff. (Arecaceae)	Bayas (TM)	Palm cabbage	Eaten	Raw or cooked	HT

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
107.	<i>Oncosperma tigillarum</i> (Jack) Ridl. (Arecaceae)	Pokok nibung (TM, MM)	Palm cabbage	Eaten	Raw	B, HT, SB
108.	<i>Paederia foetida</i> L. (Rubiaceae)	Akar seth (TM)	Ripe fruit	Eaten	Raw	SJ
109.	<i>Pangium edule</i> Reinw. (Flacourtiaceae)	Pokok kepayang (TM)	Leaf	Eaten	Cooked	B
			Fruit	Eaten	Cooked	TAR
110.	<i>Parkia speciosa</i> Hassk. (Fabaceae)	Pokok petai (TM)	Seed	Eaten	Cooked	B, BL
				Used in cooking	Raw	B, BL, TAR, UK
				Eaten	Cooked or raw	SJG
				Eaten	Cooked or raw	B
				Eaten	Cooked or raw	SK
111.	<i>Passiflora foetida</i> L. (Passifloraceae)	Pokok (MM)	Fruit	Eaten	Raw	SB
			Flower	Eaten	Raw	
112.	<i>Peliosanthes</i> sp. (Asparagaceae)	Bawang hutan/ Bawang nujuk (MM)	Bulb	Eaten	Cooked	SK
113.	<i>Peliosanthes teta</i> Andrews (Asparagaceae)	Lembak biasa (TM)	Fruit	Eaten	Raw	SJG
114.	<i>Pellacalyx axillaris</i> Korth. (Rhizophoraceae)	Pokok kenunung/ Pokok kanau hutan (TM)	Fruit	Eaten	Raw	SJG
115.	<i>Pereskia bleo</i> (Kunth) DC. (Cactaceae)	Pokok jarum tujuh bilah (TM)	Fruit	Eaten	Raw	SJG
116.	<i>Phaseolus vulgaris</i> L. (Fabaceae)	Kacang buncis (TM)	Fruit	Eaten	Cooked	TAR
117.	<i>Phyllanthus</i> sp. (Phyllanthaceae)	Sangkang hayam (TM)	Leaf	Eaten	Cooked	TAR

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
118.	<i>Phyllostachys aurea</i> Carr. ex A. & C. Rivière (Poaceae)	Rebung (TM)	Shoot	Eaten	Cooked	UK
119.	<i>Pinanga malatiana</i> (Mart.) Scheff. (Arecaceae)	Pinang legong (TM) Pokok pinang legung (TM)	Seed	Eaten	Raw	HT TAR
120.	<i>Piper aduncum</i> L. (Piperaceae)	Sirih cambai (TM)	Leaf	Eaten	Raw	UK, SJG
121.	<i>Piper betel</i> L. (Piperaceae)	Daun sireh (TM) Sirih (TM, MM)	Leaf Leaf	Eaten Eaten	Raw Raw	B KA, SJG, TAR, SJ
122.	<i>Piper caninum</i> Blume (Piperaceae)	Sirih hutan/ Pokok gao' (TM)	Leaf	Eaten	Raw	SJG
123.	<i>Piper sarmentosum</i> Roxb. (Piperaceae)	Pokok kaduk (TM, MM)	Leaf	Eaten	Raw	B, SJ
124.	<i>Piper</i> sp. 1 (Piperaceae)	Sirih kemayong (TM)	Leaf	Eaten	Raw	B
125.	<i>Piper</i> sp. 2 (Piperaceae)	Daun kadok hutan (TM)	Tuber	Eaten	Cooked	SJG
126.	<i>Piper</i> sp. 3 (Piperaceae)	Sireh kalong (MM)	Leaf	Eaten	Raw	SB
127.	<i>Piptospatha perakensis</i> (Engl.) Ridl. (Araceae)	Pokok cacok (TM)	Shoot	Eaten	Cooked	UK
128.	<i>Pleocnemia irregularis</i> (C. Presl) Holttum (Dryopteridaceae)	Paku papan (TM)	Young frond	Eaten	Cooked	B, G, HT, KA, TAR, UK
129.	<i>Pometia pinnata</i> J. R. Frost. & G. Frost (Sapindaceae)	Pokok kasai (TM)	Fruit	Eaten	Raw	HT
130.	<i>Psidium guajava</i> L. (Myrtaceae)	Pokok jambu batu (TM, MM)	Fruit Shoot	Eaten Eaten	Raw Raw	B, KP, SK SB
131.	<i>Psophocarpus tetragonolobus</i> (L.) DC. (Fabaceae)	Kacang botol (TM, MM)	Fruit	Eaten	Raw	TAR, SK
132.	<i>Punica granatum</i> L. (Punicaceae)	Buah delima (MM)	Fruit	Eaten	Raw	SK
133.	<i>Rhizophora apiculata</i> Blume (Rhizophoraceae)	Bakau minyak (MM)	Seed	Eaten	Raw	SJ, SR

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
134.	<i>Rhizophora mucronata</i> Lam. (Rhizophoraceae)	Bakau kurap (MM)	Seed	Eaten	Raw	SR
135.	<i>Rhodamnia</i> sp. (Myrtaceae)	Pokok rohat (TM)	Shoot	Eaten	Cooked	SJG
136.	<i>Salacca zaiacca</i> (Gaertn.) Voss (Arecaceae)	Asam paya (MM)	Fruit	Eaten	Raw	SB
137.	<i>Saraca cauliflora</i> Baker (Fabaceae)	Kasai (TM)	Fruit	Eaten	Raw	B
138.	<i>Saraca declinata</i> Miq. (Fabaceae)	Pokok kapih (TM)	Shoot	Eaten	Raw or cooked	KA
		Pokok kapih api (TM)	Shoot	Eaten	Cooked	TAR
			Fruit	Eaten	Cooked	
139.	<i>Saraca</i> sp. 1 (Fabaceae)	Pucuk kapih (TM)	Shoot	Eaten and used in cooking	Raw	BL
140.	<i>Saraca</i> sp. 2 (Fabaceae)	Pucuk kapih (TM)	Leaf, fruit	Eaten	Cooked	G
		Pucuk kapih (TM)	Shoot	Eaten	Cooked	B
141.	<i>Saraca thaipingensis</i> Prain (Fabaceae)	Pokok kapih biasa/ Kapih air/ Pokok kapih (TM)	Fruit	Eaten	Cooked or raw	TAR
142.	<i>Sauropus androgynus</i> (L.) Merr. (Phyllanthaceae)	Pucuk semanis (TM)	Shoot	Eaten	Cooked	B, G, UK
		Pucuk manis (TM)				TAR
143.	<i>Schizostachyum brachycladum</i> Kurz (Poaceae)	Buluh lehang (TM)	Shoot	Eaten	Raw or cooked	BL
		Buluh kuning (TM)	Shoot	Eaten	Cooked	SJG
144.	<i>Schizostachyum gracile</i> (Munro) Holttum (Poaceae)	Buluh akar (TM)	Shoot	Eaten	Cooked	B

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
145.	<i>Scorodocarpus borneensis</i> Becc. (Olacaceae)	Pokok kulim (TM)	Seed	Used in cooking	Raw	HT, KA, SJG, TAR
			Shoot	Eaten	Cooked	KA, HT
			Leaf	Eaten	Raw	KA
146.	<i>Sesbania grandiflora</i> (L.) Pers. (Fabaceae)	Pokok turi (MM)	Shoot	Eaten	Raw	TAR
			Flower	Used in cooking	Raw	SJ
147.	<i>Smilax</i> sp. (Smilacaceae)	Majon (TM)	Tuber	Eaten	Cooked	SJG
148.	<i>Solanum ferrox</i> L. (Solanaceae)	Terung ulam (MM)	Fruit	Used in cooking	Raw	SK
		Terung panjang/ Terung bulat (MM)	Fruit	Eaten	Cooed	KP
		Terung kecil/ Terung bulat (MM)	Leaf	Eaten	Cooked	SJ
150.	<i>Solanum torvum</i> Sw. (Solanaceae)	Terung lembang (TM)	Fruit	Used in cooking	Raw	SJG
		Terung pipit (TM, MM)	Fruit	Eaten and used in cooking	Raw	SK
		Terung geret (MM)	Fruit	Eaten	Raw	SJ
151.	<i>Sonerila heterophylla</i> Jack (Melastomataceae)	Asam puyuh (TM)	Leaf	Used in cooking and eaten	Raw	BL
		Berembang (MM)				KP, SR
152.	<i>Sonneratia caseolaris</i> (L.) Engl. (Sonneratiaceae)	Bembang/ Pokok berembang (MM) Asam bumbang (MM)	Fruit	Eaten	Raw	SJ SB

Appendix 6: (continued)

No.	Botanical name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)	
153.	<i>Sonneratia ovata</i> Backer (Sonneratiaceae)	Gedabu/ Asam dabu (MM)	Fruit	Eaten	Raw	SB	
		Pokok dabu (MM)				SJ, SR	
154.	<i>Stenochlaena palustris</i> (Burm.f.) Bedd. (Blechnaceae)	Paku larat (TM)				TAR	
		Paku hele' (MM)				KP	
		Pucuk paku/ Hele'k (MM)	Young frond	Eaten	Cooked		SJ
		Paku (MM)					SR
155.	<i>Syzygium polyanthum</i> (Wight) Walp. (Myrtaceae)	Heleh/ Pucuk paku merah/ He'le/ Paku merah (MM)	Young frond	Eaten	Raw or cooked	SB	
		Pucuk salam (TM)	Shoot	Eaten	Cooked Raw	B BL	
156.	<i>Tamarindus indica</i> L. (Fabaceae)	Asam jawa (MM)	Fruit	Used in cooking and eaten	Raw	KP	
157.	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson (Menispermaceae)	Patawali (MM)	Leaf	Eaten	Raw	KP	
158.	<i>Uncaria</i> sp. (Rubiaceae)	Gambir melaka (TM)	Fruit	Eaten	Raw	TAR	
159.	<i>Vigna unguiculata</i> subsp. <i>sesquipedalis</i> (L.) Verdc. (Fabaceae)	Kacang panjang (TM)	Fruit	Eaten	Cooked	TAR	
160.	<i>Vitex pubescens</i> Vahl. (Verbenaceae)	Pucuk leban (TM, MM)	Shoot	Eaten	Raw	BL, SJ	
161.	<i>Wikstroemia ridleyi</i> Gamble (Thymelaeaceae)	Pucuk depu (TM)	Shoot	Eaten	Cooked	B	
162.	<i>Zea mays</i> L. (Poaceae)	Jagung (TM)	Fruit	Eaten	Cooked	G	
163.	<i>Zingiber spectabile</i> Griff. (Zingiberaceae)	Pokok carak (TM)	Fruit	Eaten	Raw	B	
		Tepus carak (TM)	Pith	Eaten	Cooked	KA	

Appendix 7: List of mushroom species utilized for consumption by the Orang Asli

No.	Mycological name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
1.	<i>Agaricus moelleri</i> Wasser (Agaricaceae)	Cendawan susu pelanduk (TM)	Whole	Eaten	Cooked	B
		Cendawan lebeng (TM)	Whole	Eaten	Cooked	B
2.	<i>Auricularia auricula-judae</i> (Bull.) Quél. (Auriculariaceae)	Cendawan memeh (TM, MM)	Whole	Eaten	Cooked	BL, G, KA, SJG, TAR, UK, SJ
		Cendawan telinga beruk (TM)				
		Cendawan terbebeh (TM)				
		Cendawan bebek (MM)				
		Petih bebek (MM)				
Cendawan telinga kelawar/ Petih telinga kelawar/ Cendawan telinga monyet (MM)	Whole	Eaten	Cooked	KP		
3.	<i>Calvatia craniformis</i> (Schw.) Fr. (Lycoperdaceae)	Cendawan pau (TM)	Whole	Eaten	Cooked	UK
4.	<i>Cantharellus</i> sp. (Cantharellaceae)	Cendawan raja (TM)	Whole	Eaten	Cooked	B
		Cendawan merbau/ Cendawan pokok merbau (TM)	Whole	Eaten	Cooked	B
5.	<i>Clavulina</i> sp. (Clavulinaceae)	Cendawan batang/ Cendawan merbau (TM)	Whole	Eaten	Cooked	BL
6.	<i>Filoboletus manipularis</i> (Berk.) Singer (Tricholomataceae)	Cendawan butang (TM)	Whole	Eaten	Cooked	UK
		Cendawan tiong (TM)	Whole	Eaten	Cooked	B, BL
Cendawan kaki tiung (TM)	G					
7.	<i>Hygrocybe conica</i> (Scop.) P. Kumm. (Hygrophoraceae)	Cendawan kaki tiung (TM)	Whole	Eaten	Cooked	BL, HT, TAR

Appendix 7: (continued)

No.	Mycological name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
8.	<i>Lentinus connatus</i> Berk. (Polyporaceae)	Cendawan takau (TM)	Whole	Eaten	Cooked	B, BL
9.	<i>Lentinus sajor-caju</i> (Fr.) Fr. (Polyporaceae)	Cendawan cicar (TM)	Whole	Eaten	Cooked	TAR
10.	<i>Lentinus squarrosulus</i> Mont. (Polyporaceae)	Cendawan putih mata (TM)	Whole	Eaten	Cooked	B, BL, G, HT, KA, SJG, TAR
		Cendawan putih (TM)				SJG, TAR
		Cendawan sial (TM)				UK
		Cendawan tunggul (TM)				HT
		Petih putih (MM)				KP
11.	<i>Lentinus strigosus</i> (Schwein) Fr. (Polyporaceae)	Cendawan telinga beruk (TM)	Whole	Eaten	Cooked	B, BL, G, SJG, TAR, UK
		Cendawan telinga beruk/ Cendawan memeh (TM)				HT
12.	<i>Lignosus rhinocerotis</i> (Cooke) Ryvarden (Polyporaceae)	Cendawan susu harimau (TM)	Whole	Eaten	Cooked	TAR
13.	<i>Microporus xanthopus</i> (Fr.) Kuntze (Polyporaceae)	Cendawan perapat/ Cendawan pengereng (TM)	Whole	Eaten	Cooked	BL
14.	<i>Schizophyllum commune</i> Fr. (Schizophyllaceae)	Cendawan kukur (TM, MM)	Whole	Eaten	Cooked	B, BL, G, HT, KA, SJG, UK, SB, SJ, SR
		Cendawan kokor (TM, MM)				KA, TAR, KP
		Cendawan kongkong (TM)				HT
		Cendawan kerang (TM)				B
		Petih kukur (MM)				SB, SK
		Cendawan kukuh (MM)				SJ

Appendix 7: (continued)

No.	Mycological name	Vernacular name	Part(s) used	Utilization	Preparation	Village(s)
14.	<i>Schizophyllum commune</i> Fr. (Schizophyllaceae)	Cendawan kokor/ Cendawan kukuh (MM)	Whole	Eaten	Cooked	KP
		Cendawan susu (TM)				B
15.	<i>Termitomyces clypeatus</i> R. Heim (Lyophyllaceae)	Cendawan pelanduk kancil (TM)	Whole	Eaten	Cooked	G
		Cendawan busut (TM)				B, KA, UK
		Cendawan susu pelanduk (TM)				B, BL, HT, KA, SJG, TAR, UK
16.	<i>Termitomyces heimii</i> Natarajan (Lyophyllaceae)	Cendawan tahu (TM)	Whole	Eaten	Cooked	BL
		Cendawan busut (TM, MM)				B, BL, G, HT, KA, SJG, TAR, UK, SJ, SR
		Cendawan guruh (MM)				KP, SB, SJ
		Petih busut (MM)				KP
		Petih guruh (MM)				SB, SJ, SK
		Cendawan susu pelanduk (TM)				B
		Cendawan kaki pelanduk (TM)				UK
17.	<i>Termitomyces microcarpus</i> (Berk & Broome) R. Heim (Lyophyllaceae)	Cendawan melukut (TM)	Whole	Eaten	Cooked	B, BL, UK
		Cendawan (TM)				KA
		Cendawan kelapa sawit (MM)				KP, SJ, SB, SK
		Cendawan tandan kelapa sawit (MM)				SJ
18.	<i>Volvariella volvacea</i> (Bull.) Singer (Pluteaceae)	Cendawan tandan (MM)	Whole	Eaten	Cooked	KP, SR

Appendix 8: List of animal species utilized for consumption by the Orang Asli

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
1.	<i>Acridotheres grandis</i> Moore (Sturnidae)	Burung tiong (TM)	Meat	Eaten	Cooked	UK
2.	<i>Acrossocheilus deuratus</i> Cuvier & Valenciennes (Cyprinidae)	Ikan daun (TM)	Meat	Eaten	Cooked	HT
3.	<i>Aeromys tephromelas</i> Günther (Sciuridae)	Tupai terbang (TM)	Meat	Eaten	Cooked	BL
4.	<i>Amaurornis phoenicurus</i> Pennant (Rallidae)	Burung guang (TM)	Meat	Eaten	Cooked	B
		Burung wakwak (MM, TM)				KA, TAR, KP, SJ, SK, SR
5.	<i>Amblyceps mangois</i> Hamilton (Amblycipitidae)	Ikan keli sungai (TM)	Meat	Eaten	Cooked	UK
6.	<i>Anabas testudineus</i> Bloch (Anabantidae)	Ikan puyuh (TM)	Meat	Eaten	Cooked	BL
		Ikan puyuh (TM)				TAR
7.	<i>Anadara</i> sp. (Arcidae)	Kerang (MM)	Meat	Eaten	Cooked	SK
8.	<i>Anas</i> sp. (Anatidae)	Itik (TM, MM)	Meat	Eaten	Cooked	B, KP, SJ
9.	<i>Anodontostoma chacunda</i> Hamilton-Buchanan (Clupeidae)	Ikan selangat (MM)	Meat	Eaten	Cooked	KP, SK
10.	<i>Anser cygnoides</i> L. (Anatidae)	Angsa (TM, MM)	Meat	Eaten	Cooked	B, SJ
		Kangait (TM)				BL
		Kalau (TM)				KA
11.	<i>Anthracoceros albirostris</i> Shaw (Bucerotidae)	Burung raya (TM)	Meat	Eaten	Cooked	TAR
		Kelicap (TM)				KA
12.	<i>Anthreptes malacensis</i> Scopoli (Nectariniidae)	Burung isan'ik/ Burung isait (TM)	Meat	Eaten	Cooked	KA
						TAR

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
13.	<i>Anthus novaeseelandiae</i> J. F. Gmelin (Motacillidae)	Burung taren (TM)	Meat	Eaten	Cooked	TAR
14.	<i>Apis</i> sp. (Apidae)	Lebah (MM)	Eggs	Eaten	Cooked	SB
			Meat	Eaten	Raw	
15.	<i>Apus affinis</i> J. E. Gray (Apodidae)	Burung layang/ Burung la'yan (TM)	Honey	Eaten	Raw	TAR
			Meat	Eaten	Cooked	
16.	<i>Arachnothera longirostra</i> Latham (Nectariniidae)	Burung isak (TM)	Meat	Eaten	Cooked	BL
17.	<i>Arctictis binturong</i> Raffles (Viverridae)	Binturong (TM)	Meat	Eaten	Cooked	B, UK
		Musang sempang (TM)				BL, UK
		Musang turun (TM)				HT
		Musang buah/ Musang menturun/ Musang/ Ijok (TM)				KA
		Musang akar (TM)				TAR
18.	<i>Arctogalidia trivirgata</i> Gray (Viverridae)	Langkap (TM)	Meat	Eaten	Cooked	B
		Musang aleau (TM)				BL
		Musang (TM)				TAR, UK
		Burung kuang (TM)				UK
19.	<i>Argusianus argus</i> L. (Phasianidae)	Landak batu (TM)	Meat	Eaten	Cooked	B, BL, HT, KA, UK
		Temboin/ Landak nibung (TM)				B, KA, TAR
20.	<i>Atherurus macrourus</i> L. (Hystricidae)	Landak kecil (TM)	Meat	Eaten	Cooked	BL
		Landak (TM, MM)				HT, TAR
		Ikan selar (MM)				TAR, KP, SJ
21.	<i>Atule mate</i> Cuvier (Carangidae)		Meat	Eaten	Cooked	SJ

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
22.	<i>Barbonyms schwanenfeldii</i> Bleeker (Cyprinidae)	Ikan lampan (TM)	Meat	Eaten	Cooked	TAR
23.	<i>Batagur affinis</i> Cantor (Geoemydidae)	Tempaya (TM)	Meat	Eaten	Cooked	BL
24.	<i>Batagur baska</i> Gray (Geoemydidae)	Jelebau (TM)	Meat	Eaten	Cooked	BL
25.	<i>Bos taurus</i> L. (Bovidae)	Lembu (TM, MM)	Meat	Eaten	Cooked	B, BL, G, HT, TAR, UK, KP, SJ, SK, SR
26.	<i>Bubulcus ibis</i> L. (Ardeidae)	Burung pocong (TM)	Meat	Eaten	Cooked	TAR
27.	<i>Buceros bicornis</i> L. (Bucerotidae)	Burung enggang (TM)	Meat	Eaten	Cooked	HT
28.	<i>Buceros rhinoceros</i> L. (Bucerotidae)	Burung enggang (TM)	Meat	Eaten	Cooked	B, BL, KA, TAR, UK
29.	<i>Callosciurus caniceps</i> Gray (Sciuridae)	Tupai ceguk/ Tupai kelapa sawit (TM) Tupai (MM)	Meat	Eaten	Cooked	B SK
30.	<i>Callosciurus nigrovittatus</i> Horsfield (Sciuridae)	Tupai pecong (TM) Tupai (MM)	Meat	Eaten	Cooked	TAR KP
31.	<i>Callosciurus notatus</i> Boddaert (Sciuridae)	Tupai merah (TM) Tupai dalik (TM) Tupai miah (TM) Tupai (TM, MM)	Meat	Eaten	Cooked	G, TAR B UK G, HT, TAR, SK
32.	<i>Callosciurus prevostii</i> Desmarest (Sciuridae)	Tupai belang (TM) Tupai (TM) Tupai mengas (TM) Tupai paeung (MM)	Meat	Eaten	Cooked	B BL, UK B, BL, TAR KP
33.	<i>Capra hircus</i> L. (Bovidae)	Kambing (TM, MM)	Meat	Eaten	Cooked	BL, HT, SJ, SR
34.	<i>Caprimulgus macrurus</i> Horsfield (Caprimulgidae)	Burung tukang (TM)	Meat	Eaten	Cooked	TAR

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
35.	<i>Centropus bengalensis</i> Gmelin (Cuculidae)	Butbut kecil (TM) Pegam (TM)	Meat	Eaten	Cooked	KA HT
36.	<i>Centropus sinensis</i> Stephens (Cuculidae)	Butbut besar (TM)	Meat	Eaten	Cooked	KA
37.	<i>Cephalocassis borneensis</i> Bleeker (Ariidae)	Ikan duri (MM)	Meat	Eaten	Cooked	SJ
38.	<i>Cervus unicolor</i> Kerr. (Cervidae)	Rusa (TM, MM)	Meat	Eaten	Cooked	B, BL, HT, KA, TAR, KP, SJ, SK
39.	<i>Chalcophaps indica</i> L. (Columbidae)	Burung punai (TM, MM) Burung koconk (MM)	Meat	Eaten	Cooked	BL, KP SK
40.	<i>Channa lucius</i> Cuvier & Valenciennes (Channidae)	Ikan bujur (TM)	Meat	Eaten	Cooked	TAR
41.	<i>Channa micropeltes</i> Cuvier & Valenciennes (Channidae)	Ikan tuman (TM)	Meat	Eaten	Cooked	TAR
42.	<i>Channa</i> sp. (Channidae)	Ikan haruan (TM)	Meat	Eaten	Cooked	TAR
43.	<i>Channa striata</i> Bloch (Channidae)	Ikan haruan (TM, MM) Ikan landang (TM)	Meat	Eaten	Cooked	SJG, TAR, SJ TAR
44.	<i>Chirocentrus dorab</i> Forsskål (Chirocentridae)	Ikan cabuk (MM)	Meat	Eaten	Cooked	SJ
45.	<i>Chirodomys gliroides</i> Blyth (Muridae)	Tikus buluh (TM) Tikus (TM)	Meat	Eaten	Cooked	BL G
46.	<i>Clarias nieuhofii</i> Valenciennes (Clariidae)	Ikan limbat (TM)	Meat	Eaten	Cooked	BL, G, TAR
47.	<i>Clarias</i> sp. (Clariidae)	Ikan keli (TM)	Meat	Eaten	Cooked	BL, KA

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
48.	<i>Coilia dussumieri</i> Valenciennes (Engraulidae)	Ikan bulu ayam (MM)	Meat	Eaten	Cooked	SJ
49.	<i>Collocalia esculenta</i> L. (Apodidae)	Burung laying/ Burung la'yan (TM)	Meat	Eaten	Cooked	TAR
50.	<i>Columba livia</i> Gmelin (Columbidae)	Burung merpati (TM)	Meat	Eaten	Cooked	B, BL
51.	<i>Copsychus malabaricus</i> Scopoli (Muscicapidae)	Burung garut (TM)	Meat	Eaten	Cooked	TAR
52.	<i>Coturnix coturnix</i> L. (Phasianidae)	Burung puyuh (TM, MM)	Meat	Eaten	Cooked	TAR, KP
53.	<i>Cultellus attenuatus</i> Dunker (Pharidae)	Siput pahat/ Siput buluh (MM)	Meat	Eaten	Cooked	SJ
54.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Kura-kura (TM, MM)	Meat	Eaten	Cooked	BL, UK, SJ
		Kura-kura katup (TM)				G
55.	<i>Cynoglossus arel</i> Bloch & Schneider (Cynoglossidae)	Ikan lidah daun (MM)	Meat	Eaten	Cooked	SJ
56.	<i>Cynoglossus puncticeps</i> Richardson (Cynoglossidae)	Ikan sebelah (MM)	Meat	Eaten	Cooked	SJ
57.	<i>Cynoglossus</i> sp. (Cynoglossidae)	Ikan sebelah (TM)	Whole	Eaten	Cooked	BL
		Belibis (TM)				BL
		Itik air (TM)				TAR
58.	<i>Dendrocygna javanica</i> Horsfield (Anatidae)	Itik hutan (MM)	Meat	Eaten	Cooked	SK
		Burung kumang (TM)				TAR
59.	<i>Dicaeum cruentatum</i> L. (Nectariniidae)	Burung kumang (TM)	Meat	Eaten	Cooked	TAR
60.	<i>Dicerorhinus sumatrensis</i> Fischer (Rhinocerotidae)	Badak (TM)	Meat	Eaten	Cooked	BL

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
61.	<i>Dinopium javanense</i> Ljugh (Picidae)	Belatuk (TM) Burung belatuk/ Teki'l (TM)	Meat	Eaten	Cooked	HT, KA TAR
62.	<i>Dremomys rufigenis</i> Blanford (Sciuridae)	Tupai kerok Tupai (TM)	Meat	Eaten	Cooked	TAR
63.	<i>Egretta</i> sp. (Ardeidae)	Bangau (TM)	Meat	Eaten	Cooked	BL
64.	<i>Elephas maximus</i> L. (Elephantidae)	Gajah (TM)	Meat	Eaten	Cooked	BL
65.	<i>Eleutheronema tetradactylum</i> Shaw (Polynemidae)	Ikan senangin (MM)	Meat	Eaten	Cooked	SJ, SK
66.	<i>Epalzeorhynchus kalopterus</i> Bleeker (Cyprinidae)	Ikan selimang (TM)	Meat	Eaten	Cooked	TAR
67.	<i>Eurystomus orientalis</i> L. (Coraciidae)	Tiong batu (TM)	Meat	Eaten	Cooked	BL
68.	<i>Fenneropenaeus merguensis</i> De Man (Penaeidae)	Udang jaring/ Udang putih (MM)	Meat	Eaten	Cooked	SJ
69.	<i>Gallinula chloropus</i> L. (Rallidae)	Tiong air (TM)	Meat	Eaten	Cooked	BL
70.	<i>Gallus domesticus</i> Höns (Phasianidae)	Ayam (TM, MM)	Meat	Eaten	Cooked	G, TAR, B, BL, KA, SJG, UK, KP, SJ, SK, SR
71.	<i>Gallus gallus</i> L. (Phasianidae)	Ayam hutan (TM, MM) Burung punai hutan (TM)	Meat	Eaten	Cooked	B, BL, KA, KP, SJ
72.	<i>Geopelia striata</i> L. (Columbidae)	Burung merbok (MM)	Egg Meat	Eaten Eaten	Cooked Cooked	TAR SJ SK
73.	<i>Gracula religiosa</i> L. (Sturnidae)	Burung tong hutan (TM) Burung tong (MM)	Meat	Eaten	Cooked	TAR SK
74.	<i>Gymnura poecilura</i> Shaw (Gymnuridae)	Ikan pari tembikar/ Ikan pari kelawar (MM)	Meat	Eaten	Cooked	SJ

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
75.	<i>Halcyon smyrnensis</i> L. (Halcyonidae)	Burung udang (TM)	Meat	Eaten	Cooked	TAR
76.	<i>Haliastur indus</i> Boddaert (Accipitridae)	Burung helang ayam (TM)	Meat	Eaten	Cooked	TAR
77.	<i>Hampala macrolepidota</i> van Hasselt (Cyprinidae)	Ikan sebarau (TM)	Meat	Eaten	Cooked	TAR
78.	<i>Harpactes kasumba</i> Raffles (Trogonidae)	Burung hudang (TM)	Meat	Eaten	Cooked	TAR
79.	<i>Helarctos malayanus</i> Raffles (Ursidae)	Beruang (TM, MM)	Meat	Eaten	Cooked	B, HT, KP
80.	<i>Himantura</i> sp. (Dasyatidae)	Ikan tuka (MM)	Meat	Eaten	Cooked	SJ
81.	<i>Hirundo daurica</i> L. (Hirundinidae)	Burung layang/ Burung la'yan (TM)	Meat	Eaten	Cooked	TAR
82.	<i>Hirundo tahitica</i> Gmelin (Hirundinidae)	Burung layang/ Burung la'yan (TM)	Meat	Eaten	Cooked	TAR
83.	<i>Hylobates lar</i> L. (Hylobatidae)	Tembok (TM)	Meat	Eaten	Cooked	B, G, TAR, UK
		Ungka (TM)				
		Lotong (TM)				
84.	<i>Hylobates</i> sp. (Hylobatidae)	Monyet (MM)	Meat	Eaten	Cooked	SJ
85.	<i>Hylobates syndactylus</i> Raffles (Hylobatidae)	Siamang (TM)	Meat	Eaten	Cooked	B, BL, G, HT, TAR
86.	<i>Hylomyscus lepidus</i> Horsfield (Sciuridae)	Tupai (TM)	Meat	Eaten	Cooked	TAR

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
87.	<i>Hystrix brachyura</i> L. (Hystricidae)	Landak raya (TM)	Meat	Eaten	Cooked	B, KA, TAR
		Landak besar (TM)				HT, TAR
		Landak biasa (TM)				BL
		Landak (TM, MM)				B, BL, HT, KA, UK, SB, SJ, SK
88.	<i>Ilisha pristigastroides</i> Bleeker (Pristigasteridae)	Ikan puput (MM)	Meat	Eaten	Cooked	SJ
89.	<i>Ilisha</i> sp. (Pristigasteridae)	Ikan beliak mata (MM)	Meat	Eaten	Cooked	SK
90.	<i>Iomys horsfieldii</i> Waterhouse (Scuriidae)	Kubong (TM)	Meat	Eaten	Cooked	B, HT, TAR, UK
		Tupai terbang (TM)				BL
		Keluang (TM)				UK
		Tupai (TM, MM)				TAR, KP
91.	<i>Irena puella</i> Latham (Irenidae)	Burung tinjang galah (TM)	Meat	Eaten	Cooked	TAR
92.	<i>Johnius amblycephalus</i> Bleeker (Sciaenidae)	Ikan gelama (MM)	Meat	Eaten	Cooked	KP, SJ, SK
93.	<i>Lariscus insignis</i> F. Cuvier (Scuriidae)	Tupai (TM)	Meat	Eaten	Cooked	TAR
94.	<i>Leptobarbus hoevenii</i> Bleeker (Cyprinidae)	Ikan jelawat (TM)	Meat	Eaten	Cooked	SJG
95.	<i>Limnonectes blythii</i> Boulenger (Dicroglossidae)	Katak behong/ Katak guguh (TM)	Meat	Eaten	Cooked	B
		Katak (TM)				B, HT, UK
96.	<i>Lonchura malacca</i> L. (Estrildidae)	Burung kerak (TM)	Meat	Eaten	Cooked	TAR
97.	<i>Lonchura punctulata</i> L. (Estrildidae)	Burung pipit (TM)	Meat	Eaten	Cooked	KA, TAR
98.	<i>Lophura erythrophthalma</i> Raffles (Phasianidae)	Pucong/ Pega (TM)	Meat	Eaten	Cooked	BL

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
99.	<i>Loriculus galgulus</i> L. (Psittacidae)	Burung selindit (TM) Serindit (MM)	Meat	Eaten	Cooked	TAR SK
100.	<i>Macaca arctoides</i> I. Geoffroy Saint-Hilaire (Cercopithecidae)	Beruk (TM)	Meat	Eaten	Cooked	HT
101.	<i>Macaca fascicularis</i> Raffles (Cercopithecidae)	Kera (TM)	Meat	Eaten	Cooked	B, BL, G, HT, SJG, TAR, UK
		Tembok (TM)				
		Monyet (TM)				
		Yen (MM)				
102.	<i>Macaca nemestrina</i> L. (Cercopithecidae)	Trup (TM) Beruk (TM, MM)	Meat	Eaten	Cooked	G B, BL, HT, TAR, UK, SB
103.	<i>Macrobrachium rosenbergii</i> de Man (Palaemonidae)	Udang galah (TM)	Meat	Eaten	Cooked	SJG
104.	<i>Macrobrachium</i> sp. (Palaemonidae)	Udang sungai (TM)	Meat	Eaten	Cooked	B
105.	<i>Malacocincla abbotti</i> Blyth (Timaliidae)	Burung hutan (TM)	Meat	Eaten	Cooked	B
106.	<i>Manis javanica</i> Desmarest (Manidae)	Kondok (TM)	Meat	Eaten	Cooked	B
		Tenggiling (TM, MM)				
107.	<i>Megalaima chrysopogon</i> Temminck (Ramphastidae)	Burung telung (TM)	Meat	Eaten	Cooked	TAR
108.	<i>Megalaspis corchyla</i> L. (Carangidae)	Ikan cencaru (MM)	Meat	Eaten	Cooked	KP, SJ
109.	<i>Merops philippinus</i> L. (Meropidae)	Burung keyok (TM)	Meat	Eaten	Cooked	TAR

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
110.	<i>Metapenaeus lysianassa</i> De Man (Penaeidae)	Udang kecil (TM)	Meat	Eaten	Cooked	B
111.	<i>Muntiacus muntjak</i> Zimmermann (Cervidae)	Kijang (TM, MM)	Meat	Eaten	Cooked	B, BL, G, HT, KA, TAR, SJ
112.	<i>Mystacoleucus marginatus</i> Cuvier & Valenciennes (Cyprinidae)	Ikan siak (TM)	Meat	Eaten	Cooked	TAR
113.	<i>Mystus baramensis</i> Regan (Bagridae)	Ikan mangit (TM)	Meat	Eaten	Cooked	TAR
114.	<i>Mystus nigriceps</i> Cuvier & Valenciennes (Bagridae)	Ikan baung pisang (TM)	Meat	Eaten	Cooked	TAR
115.	<i>Mystus vittatus</i> Bloch (Bagridae)	Ikan baung (TM)	Meat	Eaten	Cooked	TAR
116.	<i>Naemohedus sumatraensis</i> Bechstein (Bovidae)	Kambing batu (TM)	Meat	Eaten	Cooked	B
		Unggang (TM)				KA
		Kambing hutan (TM, MM)				B, HT, TAR, SK
117.	<i>Nandus nebulosus</i> Gray (Nandidae)	Ikan tamil (TM)	Meat	Eaten	Cooked	BL
118.	<i>Neolissochilus hexagonolepis</i> McClelland (Cyprinidae)	Ikan tengas (TM)	Meat	Eaten	Cooked	BL, HT, TAR
119.	<i>Neolissochilus soroides</i> Duncker (Cyprinidae)	Ikan tengas (TM)	Meat	Eaten	Cooked	G
120.	<i>Notochelys platynota</i> Gray (Geoemydidae)	Kura-kura (TM)	Meat	Eaten	Cooked	UK
121.	<i>Nycticebus coucang</i> Boddaert (Lorisidae)	Kukang (TM, MM)	Meat	Eaten	Cooked	B, SK
		Kokang (TM)				HT
		Kongkang (TM)				TAR
122.	<i>Ocypode</i> sp. (Ocypodidae)	Ketam linjung/ Ketam putih (MM)	Meat	Eaten	Cooked	SJ

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
123.	<i>Oreochromis</i> sp. (Cichlidae)	Ikan tilapia kecil (TM)	Meat	Eaten	Cooked	B
124.	<i>Oriolus chinensis</i> L. (Oriolidae)	Burung sagung (TM)	Meat	Eaten	Cooked	KA, TAR
125.	<i>Oriolus xanthonotus</i> Horsfield (Oriolidae)	Burung dendang (TM)	Meat	Eaten	Cooked	B
126.	<i>Oriitia borneensis</i> Gray (Geoemydidae)	Baning (TM)	Meat	Eaten	Cooked	G
127.	<i>Orthotomus sutorius</i> Pennant (Sylviidae)	Burung gelecet/ Gelecek (TM)	Meat	Eaten	Cooked	TAR
128.	<i>Oryctolagus</i> sp. (Leporidae)	Arnab (TM)	Meat	Eaten	Cooked	B
129.	<i>Otolithes ruber</i> Bloch & Schneider (Sciaenidae)	Ikan gelama gigi (MM)	Meat	Eaten	Cooked	SJ
130.	<i>Paguma larvata</i> C. E. H. Smith (Viverridae)	Musang merah (TM)	Meat	Eaten	Cooked	TAR
		Musang (MM)				KP
131.	<i>Pampus argenteus</i> Euphrasen (Stromateidae)	Ikan bawal (MM)	Meat	Eaten	Cooked	SJ
132.	<i>Pangasius pangasius</i> Hamilton (Pangasiidae)	Ikan patin (TM)	Meat	Eaten	Cooked	UK
133.	<i>Panthera pardus</i> L. (Felidae)	Harimau kumbang (TM)	Meat	Eaten	Cooked	B
134.	<i>Panthera tigris</i> L. (Felidae)	Harimau (TM, MM)	Meat	Eaten	Cooked	BL, HT, KP
		Chekong (TM)				HT
135.	<i>Paradoxurus hermaphroditus</i> Pallas (Viverridae)	Musang aliau (TM)	Meat	Eaten	Cooked	BL
		Musang turun (TM)				UK
		Musang kecil (MM)				KP
		Musang (TM, MM)				UK, SK
		Musang pandan (TM, MM)				BL, SK

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
136.	<i>Passer montanus</i> L. (Passeridae)	Burung kedekok/ Burung pipit (TM)	Meat	Eaten	Cooked	TAR
137.	<i>Pelargopsis capensis</i> L. (Alcedinidae)	Burung cincang galah (TM)	Meat	Eaten	Cooked	BL
138.	<i>Pelodiscus sinensis</i> Wiegmann (Trionychidae)	Kura-kura sungai (TM)	Meat	Eaten	Cooked	BL
139.	<i>Penaeus monodon</i> Fabricius (Penaeidae)	Udang harimau (MM)	Meat	Eaten	Cooked	SJ
140.	<i>Penaeus</i> sp. (Penaeidae)	Udang (MM)	Meat	Eaten	Cooked	KP
141.	<i>Petaurista petaurista</i> Pallas (Sciuridae)	Kandau (TM) Tupai terbang (TM)	Meat	Eaten	Cooked	B BL
142.	<i>Ploceus philippinus</i> L. (Ploceidae)	Burung tempua (TM)	Meat	Eaten	Cooked	TAR
143.	<i>Plotosus canius</i> Hamilton (Plotosidae)	Ikan sembilang (TM)	Meat	Eaten	Cooked	BL, UK
144.	<i>Polymesoda expansa</i> Mousson (Corbiculidae)	Lokan (MM)	Meat	Eaten	Cooked	SK, SB
145.	<i>Polymesoda</i> sp. (Corbiculidae)	Kepah (MM)	Meat	Eaten	Cooked	SJ, SK
146.	<i>Poropuntius deauratus</i> Valenciennes (Cyprinidae)	Ikan daun (TM)	Meat	Eaten	Cooked	BL
147.	<i>Poropuntius</i> sp. (Cyprinidae)	Ikan daun (TM)	Meat	Eaten	Cooked	G
148.	<i>Portunus pelagicus</i> L. (Portunidae)	Ketam (MM)	Meat	Eaten	Cooked	KP, SB, SK
149.	<i>Prebystis cristata</i> Raffles (Cercopithecidae)	Kengkong (TM)	Meat	Eaten	Cooked	HT
		Monyet (TM)				TAR
		Lotong (TM)				UK

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
150.	<i>Prebystis melalophos</i> Raffles (Cercopithecidae)	Senekah (TM)	Meat	Eaten	Cooked	G
		Cenekah/ Pamtem (TM)				HT
		Sikah (TM)				B, BL, KA, SJG, TAR, UK,
151.	<i>Prebystis obscura</i> Reid (Cercopithecidae)	Lotong (TM)	Meat	Eaten	Cooked	B, KA, TAR
152.	<i>Prebystis</i> sp. (Cercopithecidae)	Lotong (TM, MM)	Meat	Eaten	Cooked	BL, G, KA, SK, SR
153.	<i>Prionailurus planiceps</i> Vigors and Horsfield (Felidae)	Kucing hutan (MM)	Meat	Eaten	Cooked	SB
154.	<i>Pristolepis fasciatus</i> Bleeker (Nandidae)	Ikan patung (TM)	Meat	Eaten	Cooked	TAR
155.	<i>Psettodes erumei</i> Bloch & Schneider (Psettodidae)	Ikan lidah/ Ikan sebelah (MM)	Meat	Eaten	Cooked	SJ
156.	<i>Pteropus vampyrus</i> L. (Pteropodidae)	Keluang (TM, MM)	Meat	Eaten	Cooked	B, BL, KP, SK, TAR
		Kelawar (TM)				HT, TAR
157.	<i>Pycnonotus atriceps</i> Temminck (Pycnonotidae)	Merbah kuning (TM)	Meat	Eaten	Cooked	KA
158.	<i>Pycnonotus brunneus</i> Blyth (Pycnonotidae)	Burung kekong (TM)	Meat	Eaten	Cooked	TAR
		Burung kelepok (TM)				B
159.	<i>Pycnonotus goiavier</i> Scopoli (Pycnonotidae)	Merbah coklat (TM)	Meat	Eaten	Cooked	KA
		Burung merbah (TM, MM)				TAR, SK
160.	<i>Pycnonotus melanicterus</i> Gmelin (Pycnonotidae)	Merbah jambul (TM)	Meat	Eaten	Cooked	KA

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
161.	<i>Python brongersmai</i> Stull (Boidae)	Ular nipong (TM)	Meat	Eaten	Cooked	B
		Ular ipong, Ular tesang (TM)				UK
162.	<i>Python reticulatus</i> Schneider (Boidae)	Ular sawa (TM, MM)	Meat	Eaten	Cooked	B, G, HT, UK, KP
		Ular (TM, MM)				BL, KP, SK
		Tijau (MM)				SK
		Katak (MM)				KP, SB, SJ
163.	<i>Rana</i> sp. (Ranidae)		Meat	Eaten	Cooked	
164.	<i>Rasbora einthovenii</i> Bleeker (Cyprinidae)	Ikan daun/ Ikan seluan (TM)	Meat	Eaten	Cooked	B
165.	<i>Rasbora</i> sp. (Cyprinidae)	Ikan seluang/ Ikan sungai (TM)	Meat	Eaten	Cooked	UK
166.	<i>Rastrelliger</i> sp. (Scombridae)	Ikan kembong (TM)	Meat	Eaten	Cooked	BL
167.	<i>Rattus sabanus</i> Thomas (Muridae)	Tikus perah (TM)	Meat	Eaten	Cooked	BL
168.	<i>Ratufa affinis</i> Raffles (Sciuridae)	Tupai aleau (TM)	Meat	Eaten	Cooked	B
		Tupai bakah (TM)				KA
		Tupai jinjang (TM)				B
		Tupai (TM)				UK
169.	<i>Ratufa bicolor</i> Sparrman (Sciuridae)	Tupai mengas (TM)	Meat	Eaten	Cooked	B, BL, KA, TAR, UK
170.	<i>Rhamdia quelen</i> Quoy & Gaimard (Heptapteridae)	Ikan patin (TM)	Meat	Eaten	Cooked	B
171.	<i>Rhinoplax vigil</i> Forster (Bucerotidae)	Tekok (TM)	Meat	Eaten	Cooked	KA
		Burung tekok (TM)				TAR
172.	<i>Rhinosciurus laticaudatus</i> Müller (Sciuridae)	Tupai (TM)	Meat	Eaten	Cooked	TAR
173.	<i>Rhizomys</i> sp. (Muridae)	Tikus tekong (TM)	Meat	Eaten	Cooked	B

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
174.	<i>Rhizomys sumatrensis</i> Raffles (Muridae)	Dekan (TM)	Meat	Eaten	Cooked	KA, BL
		Tikus dekan (TM)				HT, TAR
		Tikus kadoi (TM)				B
		Sangkeh (TM)				TAR
		Kaneu (MM)				SK
175.	<i>Rhynchophorus ferrugineus</i> Olivier (Curculionidae)	Ulat kundi (TM)	Whole	Eaten	Cooked	BL
		Ulat di pokok kelapa (MM)	Meat	Eaten	Raw or cooked	SB
176.	<i>Robertsiella</i> sp. (Pomatiopsidae)	Siput sungai (TM)	Meat	Eaten	Cooked	B
177.	<i>Scolopendra</i> sp. (Scolopendridae)	Lipan (MM)	Meat	Eaten	Cooked	KP, SB
178.	<i>Scomberoides</i> sp. (Carangidae)	Ikan talang (MM)	Meat	Eaten	Cooked	SJ
179.	<i>Scomberomorus guttatus</i> Bloch & Schneider (Scombridae)	Ikan tenggiri (MM)	Meat	Eaten	Cooked	KP
180.	<i>Scylla serrata</i> Forskål (Portunidae)	Ketam nipah (MM)	Meat	Eaten	Cooked	KP
		Ketam batu (MM)				KP, SJ
181.	<i>Scylla</i> sp. (Portunidae)	Ketam gedeng (MM)	Meat	Eaten	Cooked	SK
182.	<i>Setipinna taty</i> Valenciennes (Engraulidae)	Ikan bersia (MM)	Meat	Eaten	Cooked	SJ
		Ikan bulus (MM)				SJ
184.	<i>Streptopelia chinensis</i> Scopoli (Columbidae)	Burung tekukur (TM, MM)	Meat	Eaten	Cooked	TAR, SK
185.	<i>Sundasciurus lowii</i> Thomas (Sciuridae)	Tupai (TM, MM)	Meat	Eaten	Cooked	TAR, KP, SJ

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
186.	<i>Sundasciurus tenuis</i> Horsfield (Scuriidae)	Tupai chuchong (TM)	Meat	Eaten	Cooked	B
		Chuichoi (TM)				HT
		Tupai (TM)				KA, TAR
187.	<i>Sus scrofa</i> L. (Suidae)	Penyondol (TM)	Meat	Eaten	Cooked	B
		Degan/ Khinzir (TM)				BL
		Babi hutan (TM)				HT
		Babi (TM)				B, KA, TAR, UK
		Ketu (MM)				SK
188.	<i>Tamias macclllandii</i> Horsfield (Scuriidae)	Tupai kodes (TM)	Meat	Eaten	Cooked	UK
		Tupai belang (MM)				KP
189.	<i>Taphozous melanopogon</i> Temminck (Emballonuridae)	Kelawar (TM)	Meat	Eaten	Cooked	UK
190.	<i>Tapirus indicus</i> Desmarest (Tapiridae)	Badak sipan (TM)	Meat	Eaten	Cooked	TAR
191.	<i>Terapon jarbua</i> Forsskal (Terapontidae)	Ikan kironng (MM)	Meat	Eaten	Cooked	SJ
192.	<i>Terebralia sulcata</i> Born (Potamididae)	Siput hisap/ Belitong (MM)	Meat	Eaten	Cooked	SJ
193.	<i>Thunnus alalunga</i> Bonnaterre (Scombridae)	Ikan kembung hidup (TM)	Meat	Eaten	Cooked	B
194.	<i>Todiramphus chloris</i> Boddaert (Halcyonidae)	Burung cincang galah (TM)	Meat	Eaten	Cooked	TAR
195.	<i>Tor</i> sp. (Cyprinidae)	Ikan kelah batu (TM)	Meat	Eaten	Cooked	G
196.	<i>Tor tambroides</i> Bleeker (Cyprinidae)	Ikan kelah (TM)	Meat	Eaten	Cooked	TAR, HT

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
197.	<i>Tragulus javanicus</i> Osbeck (Tragulidae)	Kancil (TM)	Meat	Eaten	Cooked	B, BL, G, HT, KA, TAR, UK
		Pelanduk (TM, MM)				
		Kancel (MM)				
198.	<i>Tragulus napu</i> Cuvier (Tragulidae)	Napuh (TM, MM)	Meat	Eaten	Cooked	B, BL, KA, UK, SJ
		Kancil (TM)				
		Pelanduk (TM)				
		Panduk (MM)				
199.	<i>Treron</i> sp. (Columbidae)	Burung punai (TM, MM)	Meat	Eaten	Cooked	SJ, BL, TAR
200.	<i>Trigoniulus corallinus</i> Gervais (Trigoniulidae)	Gonggok (TM)	Meat	Eaten	Cooked	B
201.	<i>Tupaia glis</i> Diard (Tupaiaidae)	Tupai chong (TM)	Meat	Eaten	Cooked	HT, TAR
		Tupai (TM)				
202.	<i>Tupaia minor</i> Günther (Tupaiaidae)	Tupai tanah (TM)	Meat	Eaten	Cooked	UK
203.	<i>Turnix suscitator</i> Gmelin (Turnicidae)	Burung puyuh (TM, MM)	Meat	Eaten	Cooked	BL, KA, KP
204.	<i>Tyto alba</i> Scopoli (Tytonidae)	Burung kuit (TM)	Meat	Eaten	Cooked	TAR
205.	<i>Valanga nigricornis</i> Burm. (Acrididae)	Belalang (MM)	Meat	Eaten	Cooked	SB
206.	<i>Varanus bengalensis</i> Daudin (Varanidae)	Biawak (TM)	Meat	Eaten	Cooked	HT, UK
207.	<i>Varanus salvator</i> Laurenti (Varanidae)	Biawak/ Baset/ Merian (TM)	Meat	Eaten	Cooked	UK
		Bangkang (MM)				
208.	<i>Varanus</i> sp. (Varanidae)	Biawak (TM, MM)	Meat	Eaten	Cooked	SJG, KP, SK

Appendix 8: (continued)

No.	Zoological Name	Vernacular name	Part(s) Used	Utilization	Preparation	Village(s)
209.	<i>Vespa</i> sp. (Vespidae)	Tebuan/ Penyegat (MM)	Eggs Meat	Eaten Eaten	Cooked Raw	SB
210.	<i>Viverra tangalunga</i> Gray (Viverridae)	Musang jebat (TM)	Meat	Eaten	Cooked	TAR
211.	<i>Viverra zibetha</i> L. (Viverridae)	Musang jebat (TM)	Meat	Eaten	Cooked	BL

Appendix 9: List of plant species utilized for spiritual purpose by the Orang Asli

No.	Botanical Name	Vernacular name	Usage	Part(s) used	Preparation and administration	Village(s)
1.	<i>Acorus calamus</i> L. (Acoraceae)	Jerangau (MM)	Child protection charm child from supernatural existence	Rhizome	Mixed with <i>Daun cekur</i> (<i>Kaempferia galanga</i>) and <i>Bonglai</i> (<i>Zingiber montanum</i>); and fixed with strings to be tied to the child's wrist as a charm	SJ
2.	<i>Bauhinia</i> sp. (Fabaceae)	Akar lapar (TM)	Dispel supernatural existence	Leaf	Dried and burned in the evening	HT
3.	<i>Cheilocostus speciosus</i> (J. König) C. Specht (Costaceae)	Pokok penduk (TM)	Kept from hunger	Root	Tied around the stomach	HT
4.	<i>Citrus aurantiifolia</i> (Christm.) Swingle (Rutaceae)	Limau nipis (TM)	<i>Demam sampu</i>	Whole	Grated and patched to the head	TAR
5.	<i>Elettariopsis</i> sp. (Zingiberaceae)	Tepus sengloi (TM)	<i>Santau</i>	Root	Boiled and the root decoction is drunk	BL
6.	<i>Durio</i> sp. (Bombacaceae)	Durian hutan (TM)	Material used in healing ceremony to cure diseases (<i>ubat jampi utuk menyembuhkan penyakit</i>)	Shoot	Eaten raw	BL
7.	<i>Embelia</i> sp. (Myrsinaceae)	Ubat demam (TM)	Protection from and dispelled evil spirit	Bud and leaf	The bud is wrapped with leaf followed by incantations	SJG
			Disturbed by spirits	Juice	Sprayed around the house yard	B
			Protection against black magic	Leaf	Rubbed and hit the affected person with leaf	B
			Fever	rind	Hung on door sill	HT
				Young shrub	Placed under patient's pillow	KA

Appendix 9: (continued)

No.	Botanical Name	Vernacular name	Usage	Part(s) used	Preparation and administration	Village(s)
8.	<i>Kaempferia galanga</i> L. (Zingiberaceae)	Daun cekur (MM)	Children who cried caused from supernatural existence	Rhizome	Fixed with strings and tied to the child's wrist	SJ
9.	<i>Lasianthus cyanocarpus</i> Jack (Rubiaceae)	Kayu celaka (TM)	Separate couples or caused hatred in other people	Leaf or root	Infused in oil (e.g. coconut oil) and sprayed to the intended person or couple	B
10.	<i>Melastoma sanguineum</i> Sims. (Melastomaceae)	Senduduk bunga putih (MM)	Protection from fever caused from sun shower	Root, flower and shoots	Placed behind the ear to protect from the fever	SK
11.	<i>Pandanus</i> sp. (Pandanaeae)	Mengkuang (MM)	Dispel spirit from entering the house	Thorn	Hanged in front of the house	SB
12.	<i>Scindapsus hederaceus</i> Miq. (Araceae)	Akar lapar (TM)	Kept from hunger	Root	Tied around the wrist	SJG
13.	<i>Xylocarpus moluccensis</i> (Imk.) Roem. (Meliaceae)	Nyireh batu (MM)	Woodcarving	Wood	Carved for beliefs and medicinal healing	SB
14.	<i>Zingiber montanum</i> (J. König) Link ex A. Dietr. (Zingiberaceae)	Bonglai (TM)	Spiritual disturbances	Rhizome	Sliced and infused with water. The water is applied to the body and affected area	B

Appendix 10: List of animal species utilized for spiritual purpose by the Orang Asli

No.	Zoological Name	Vernacular name	Usage	Part(s) used	Preparation and administration	Village(s)
1.	<i>Channa striata</i> Bloch (Ophiocephalidae)	Ikkan haruan (TM)	Delayed walking in children	Head (living fish)	Tapped to the knees three times on both legs	TAR
2.	<i>Cuora amboinensis</i> Daudin (Geoemydidae)	Kura-kura mangkuk/ Kura-kura temahang (MM)	Boil	Head (living tortoise)	Moved back and forth to the affected area 7 times per set (to be practice 2 to 3 set per day)	KP
3.	<i>Hylobates</i> sp. (Hylobatidae)	Ungka (TM)	Spirit disturbance	Liver	Fried, dried, pounded, infused in water and drunk	BL
4.	<i>Hystrix brachyura</i> L. (Hystriidae)	Landak (MM)	Avoid disease from entering the house Medicine	Whole Magic stone	Hanged outside of the house Dried until it hardens and used as a medicine	KP SK
5.	<i>Limulus polyphemus</i> L. (Limulidae)	Belangkas (MM)	Love potion for spouses	Oil (tail) Fat	Applied to the groin Cooked until it turns to oil and eaten by couples or spouses	SK SB
6.	<i>Manis javanica</i> Desmarest (Manidae)	Tenggiling (TM, MM)	Avoid the fever caused from sun shower Prevent high fever caused from sun shower Charm to avoid any diseases caused by sun shower Frequently crying children	Scale	Burned a little Worn by children (as amulet or charm) Worn in the evening and night as a charm as necklace (for children) or keychain (for adult) Charred and the ashes is applied on the child's face	KA SB UK SJG

Appendix 10: (continued)

No.	Zoological Name	Vernacular name	Usage	Part(s) used	Preparation and administration	Village(s)
7.	<i>Rhinoplax vigil</i> Forster (Bucerotidae)	Burung tekok (TM)	Poison detector (exposed poison)	Casque	Made into a ring and worn. It will break if there is poison nearby (in the food or water served)	BL, KA, UK
8.	<i>Termes</i> sp. (Termitidae)	Tekoi (TM)	Sleepwalking	Whole	Kicked from its original place without glancing back	B, SJG

PUBLICATION

Ethno-medicinal Resources Used By the Temuan in Ulu Kuang Village

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ABSTRACT Orang Asli is a term used for the aborigines in Peninsular Malaysia. This study reveals the ethno-medicines used by one of the tribes of Orang Asli, Temuan in Ulu Kuang Village, Gombak, Selangor, Malaysia. The study which was conducted through semi-constructed questionnaire found a total of 47 species of plants from 36 families, 7 species of mushrooms from 5 families, and 12 species of animals from 10 families being utilized as medicines by the villagers. Among the ailments treated, hypertension was shown to be the most treated ailment utilizing 12 species of natural resources in total. The most utilized species of plant, mushroom, and animal by the Temuan in Ulu Kuang Village for medicine are *Eurycoma longifolia*, *Lignosus rhinocerus*, and *Hystrix brachyura*, respectively.

INTRODUCTION

Natural resources such as plants, animals, and mushrooms play a vital role since ancient times to treat illnesses. In recent years, the research on ethno-medicinal resources has been extensive in order to develop new products and medicines to treat diseases. Medicines derived from natural resources posed a potentially safer and more reliable medicine than synthetically produced drugs.

The Temuan is one of the eighteen tribes of Orang Asli or aborigines in Peninsular Malaysia. They belong to the ethnicity of Proto-Malays who originated from middle Asia and settled in Peninsular Malaysia around 4000 years ago (Fix 1995; Lim et al. 2010). They have been utilizing the natural resources around them all this time for food, daily used materials - and medicinal purposes. The Temuan are known as 'Orang Bukit' or Hill People among the Orang Asli since they reside in jungle areas near the hill side. Thus, they are among the most knowledgeable Orang Asli tribes on natural resources utilization, especially for medicinal purposes. This study gathered ethno-medicinal information from the Temuan in Ulu Kuang Village to treat and cure ailments. It is of great importance to record such traditional knowledge and pub-

lish the scientific data before it becomes completely depleted with the loss of natural habitats surrounding them and the passing away of the older generations.

METHODOLOGY

The study was conducted in the year 2010 in Ulu Kuang Village, Kuang, Gombak, Selangor, which is located at N 03° 15' 46.0" E 101° 34' 59.5" and a total area of 121.46 hectares. The interviews were conducted with semi-constructed questionnaires among the villagers who possess the knowledge of medicinal usage of natural resources recommended by the head of the village or 'Tok Batin' and Malaysian Department of Orang Asli Development officers.

RESULTS AND DISCUSSION

The study reveals 47 species of plants from 36 families (Table 1); 7 species of mushrooms from 5 families (Table 2); and 12 species of animals from 10 families (Table 3) are utilized by the Temuan in Ulu Kuang Village, Gombak, Selangor, Malaysia for various medicinal purposes.

From the result, it shows that *Eurycoma longifolia*, *Lignosus rhinocerus*, and *Hystrix brachyura* are used in treating the highest number of ailments in comparison to other species of plants, mushrooms, and animals with four ailments treated, each. *Eurycoma longifolia* is used in treating muscle pain, diabetes, hypertension, and overall health using its leaf and

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Table 1: The plants used for medicinal purposes in Ulu Kuang Village

<i>Botanical name</i>	<i>Local name</i>	<i>Part(s) used</i>	<i>Ailments treated</i>	<i>Preparation(s)</i>	<i>Administration</i>
<i>Alpinia galanga</i> (L.) Willd. (Zingiberaceae)	Sengkuas	Rhizome	<i>Tinea versicolor</i>	Raw	Topical
<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Bayam Duri	Whole	Jaundice	Decoction	Bath
<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Ness (Acanthaceae)	Hempedu Bumi	Leaf	Hypertension and diabetes	Decoction or infuse with water	Oral
<i>Angiopteris evecta</i> (Forst.) Hoffm. (Marattiaceae)	Paku Gajah	Root Tuber	Hematochezia Ringworm and <i>Tinea versicolor</i>	Decoction Comminute and infuse with coconut oil	Oral Topical
<i>Archidendron jiringa</i> (Jack) I.C.Nielsen (Fabaceae)	Pokok Jering	Root	Hypertension and diabetes	Decoction	Oral
<i>Artabotrys</i> sp. (Annonaceae)	Sembelit	Seed	Diabetes	Raw	Oral
	Betina	Root	Constipation and joint pain	Decoction	Oral
<i>Artocarpus heterophyllus</i> Lam. (Moraceae)	Nangka	Leaf	Scabies	Charred and infuse with oil	Topical
<i>Averrhoa carambola</i> L. (Oxalidaceae)	Belimbing Besi	Dried or fallen leaf	Hypertension and diabetes	Decoction	Oral
<i>Bauhinia crudiantha</i> (de Wit) Cusset (Fabaceae)	Akar Lembang	Exudates	Rashes on lips	Infuse with water or raw	Oral or topical
<i>Capsicum baccatum</i> var. <i>pendulum</i> (Willd.) Eshb. (Solanaceae)	Pokok Lada	Leaf	Ringworm	Parched and mashed with slaked lime	Topical
<i>Cheilocostus speciosus</i> (Koenig) Smith (Costaceae)	Pokok Penduk	Stem	Antidote	Raw	Oral
<i>Cinnamomum</i> sp. (Lauraceae)	Medang Tijo	Leaf and root	Muscle stiffness or pain	Raw and infuse with coconut oil	Embrocation
<i>Cleome viscosa</i> L. (Capparaceae)	Bunga Maman	Shoot	Light-headedness	Raw	Oral
<i>Cnestis palala</i> (Lour.) Merr. (Connaraceae)	Sembelit Jantan	Root	Constipation and joint pain	Decoction	Oral
<i>Cnestis</i> sp. (Fabaceae)	Akar Sembelit	Root (twining root)	Hypertension and diabetes	Decoction	Oral
<i>Cocos nucifera</i> L. (Arecaceae)	Kelapa Muda	Young coconut milk	Shingle	Chanted	Oral
<i>Crinum asiaticum</i> L. (Amaryllidaceae)	Tembaga Suasa	Leaf	Fracture and sprained	Parched	Wrapped
<i>Didymocarpus platypus</i> C.B. Clarke (Gesneriaceae)	Meriyan Gete'h	Leaf	High fever	Decoction	Bath
<i>Donax canniiformis</i> (G.Forst.) K.Schum. (Marantaceae)	Daun Bemban	Fruit	Boils and abscess	Raw	Oral
<i>Durio zibethinus</i> Murray (Bombacaceae)	Pokok Durian	Root	Hypertension and diabetes	Decoction	Oral
<i>Eurycoma longifolia</i> Jack (Simaroubaceae)	Tongkat Ali	Root	Muscle pain, diabetes, and hypertension	Decoction	Oral
		Leaf and root	Overall health	Decoction	Oral
<i>Fagraea obovata</i> Wall. (Loganiaceae)	Akar Tengkok Jawak	Root	Asthma and cough	Decoction	Oral
<i>Globba patens</i> Miq (Zingiberaceae)	Tepus Pemulih	Exudates	Mouth ulcer	Raw	Topical
<i>Hymenocallis speciosa</i> (L.f. ex Salisb.) Salisb. (Alliaceae)	Pokok Demam Panas	Leaf	Jaundice	Decoction	Bath

Table 1: Contd.....

Botanical name	Local name	Part(s) used	Ailments treated	Preparation(s)	Administration
<i>Ixonanthes icosandra</i> Jack (Ixonanthaceae)	Pokok Kayu Pagar Anak	Root	Fertility	Decoction	Oral
<i>Labisia pumila</i> (Blume) Fer.-Vill. (Myrsinaceae)	Kacip Fatimah	Leaf and root	Overall health	Decoction	Oral
<i>Lasia</i> sp. (Araceae)	Akar Segenuali	Leaf or root	Swelling (postpartum)	Decoction	Bath (leaf) or oral (root)
		Root	Postpartum	Decoction	Bath or oral
<i>Leea indica</i> (Burm.f.) Merr. (Leeaceae)	Pokok Membali or Pokok Memali	Leaf or shoot	Wound	Mashed	Poultice
<i>Mallotus</i> sp. (Euphorbiaceae)	Pokok Tembung	Leaf	Nose bleeding or blocked nose	Raw and rolled	Inserted in nostril
<i>Mapania</i> sp. (Cyperaceae)	Mengkuang Bantut	Shoot	Family planning	Raw	Oral with <i>Piper betel</i> L.
<i>Mikania cordata</i> (Burm.f.) B.L.Roxb. (Asteraceae)	Akar Ulan	Leaf	Wound	Mashed	Poultice
<i>Mikania micrantha</i> Kunth. (Asteraceae)	Daun Ulan	Leaf	Wound	Mashed with charcoal	Poultice
<i>Molineria latifolia</i> (Dryand.) Herb. ex Kurz (Hypoxidaceae)	Lembak	Exudates	Ulcer	Raw	Topical
<i>Muntingia calabura</i> L. (Muntingiaceae)	Daun Cere	Leaf	Diabetes	Decoction	Oral
<i>Musa balbisiana</i> Colla (Musaceae)	Pisang Hutan	Fruit's exudates	Ulcer	Raw	Topical
<i>Musa</i> sp. (Musaceae)	Pisang Abu	Pith	Congestive heart failure and hypertension	Decoction	Oral
<i>Parkia speciosa</i> Hassk. (Fabaceae)	Pokok Petai	Bean pod and seed	Diabetes	Raw	Oral
		Root	Hypertension and diabetes	Decoction	Oral
<i>Phyllagathis rotundifolia</i> (Jack) Blume (Melastomataceae)	Daun Semalam	Root	Overall health	Decoction	Oral
<i>Piper porphyrophyllum</i> N.E. Brown (Piperaceae)	Sirih Murai	Leaf	Febrifuge and cold	Mashed	Topical
<i>Piper</i> sp. (Piperaceae)	Sirih Camai	Leaf	Hypertension	Raw	Oral
<i>Polyalthia bullata</i> King (Annonaceae)	Tongkat Ali Hitam	Root	Asthma, diabetes, waist pain	Decoction	Oral
<i>Smilax myosotiflora</i> A.DC. (Smilacaceae)	Ubi Jaga	Rhizome	Fracture, overall health, muscle pain	Decoction	Oral
<i>Tacca</i> sp. (Dioscoreaceae)	Lebak Merah	Root	Hypertension	Decoction	Oral
<i>Trevesia burckii</i> Boerl. (Araliaceae)	Pokok Kia'	Root	Aches	Decoction	Bath
<i>Zingiber montanum</i> (J.König) Link ex A. Dietr. (Zingiberaceae)	Bonglai	Rhizome	Shingles, gout, and ascites	Chanted and grated	Topical
<i>Zingiber officinale</i> Roscoe (Zingiberaceae)	Halia	Rhizome	Contusions	Raw	Poultice
<i>Zingiber</i> sp. (Zingiberaceae)	Tepus Belang-Belang	Exudates	Carminative (children)	Raw	Topical

root (Table 1). *Lignosus rhinocerus* meanwhile is used in treating postpartum, cough, cold, and asthma using its sclerotium (Table 2), and *H. brachyura* is used to treat asthma, breathlessness, stomach diseases, and high fever using the quill, gall, faeces, and meat, respectively (Table 3). Overall, twelve different species of natural

resources are used in treating hypertension using 11 species of plants and one species of animal, making it the most commonly treated ailment using the natural resources in the village studied. Most of the medicines are prepared through decoction and most are taken orally with 25 and 44 medicines, respectively.

Table 2: The mushrooms used for medicinal purposes in Ulu Kuang Village

<i>Mycological name</i>	<i>Local name</i>	<i>Parts(s) used</i>	<i>Ailments treated</i>	<i>Preparation(s)</i>	<i>Administration</i>
<i>Amauroderma</i> sp. (Ganodermataceae)	Cendawan Sawan	Stipe	Epilepsy	Raw	Wore like necklace
		Whole	Baby cries late at night	Raw	Wore like necklace
<i>Auricularia auricula-judae</i> (Bull.) Quél. (Auriculariaceae)	Cendawan Memeh	Whole	Febrifuge	Charred	Topical
<i>Coprinus</i> sp. (Agaricaceae)	Cendawan Kaki Satu	Whole	Pruritis and <i>Tinea versicolor</i>	Mashed	Topical
<i>Lignosus rhinocerus</i> (Cooke) Ryvarden (Polyporaceae)	Cendawan Susu Harimau	Sclerotium	Postpartum	Concocted with <i>Polyalthia bullata</i>	Oral
			Cough, cold, and asthma	Decoction	Oral
<i>Microporus xanthopus</i> (Fr.) Kuntze (Polyporaceae)	Cendawan Pengering	Whole	Contraceptive	Mashed with <i>P. betel</i> extract and chanted	Topical
<i>Pycnoporus sanguineus</i> (L.) Murill (Polyporaceae)	Cendawan Be'reng or Bereh	Whole	Wound and sore	Charred and concocted with oil	Topical
<i>Termitomyces clypeatus</i> R.Heim (Lyophyllaceae)	Cendawan Susu Pelanduk	Whole	Lassitude and febrifuge	Boiled	Oral

A total of 40 ailments are treated using plants where the most frequently treated ailment is hypertension using eleven species of plants followed by diabetes with nine species of plants (Table 1). The most frequently utilized plant part is root from 17 species followed by leaf from 15 species of plants (Table 1). Among the species of plants used by the villagers, only *Angiopteris evecta* which is used for ringworm and *Tinea versicolor* belong to the Pteridophytes group while the others are either monocotyledon (16 species) or dicotyledon (30 species). The mushroom species on the other hand are utilized by the Temuan villagers in treating 13 ailments (Table 2). The whole part of mushroom is frequently utilized specifically from 6 species of mushrooms. Two species of mushrooms can be used in treating fever which is the most frequently treated ailment using mushroom species, namely *Auricularia auricula-judae* and *Termitomyces clypeatus*. Eleven ailments meanwhile are treated using animal species (Table 3). Among them, the most frequently treated ailment is breathlessness with four species of animals, *Achatina fulica*, *H. brachyura*, *Ratufa bicolor* and *Scolopendra* sp., followed by asthma with three species, using the same species as breathlessness except for *R. bicolor*. Among

the parts of animals used, the most frequently utilized part is meat followed by gall from 6 and 2 species of animals, respectively. Overall, the most utilized families are Zingiberaceae (Table 1), Polyporaceae (Table 2), Boidae, and Channidae (Table 3).

Certain species such as *Donax canniformis* which is used for boil and abscess in this study is also used by other tribe of Orang Asli in Peninsular Malaysia such as the Jakun of Endau Rompin who also used it in treating boil (Johor Biotechnology and Biodiversity Corporation 2007). Meanwhile, the Malays of Machang, Kelantan used the species *Polyalthia bullata* in treating diabetes (Ong and Nordiana 1999) which is one of the ailments treated by the Temuan in this study using the very same species of plant. Chang and Lee (2001) and Lee and Chang (2007) meanwhile revealed that *Pycnoporus sanguineus* is used in Malaysia in treating wound, which is similar to the result of this study where it is used for wound and sore. The Temuan of Ulu Kuang Village used the species *A. paniculata* in treating hypertension and diabetes using the decoction or infusion of its leaf and hematochezia or bloody stools using its root's decoction. In Malaysia, it is also generally used in treating hypertension and diabe-

Table 3: The animals used for medicinal purposes in Ulu Kuang Village

Zoological name	Local name	Parts(s) used	Ailments treated	Preparation(s)	Administration
<i>Achatina fulica</i> Ferussac (Achatinidae)	Siput Babi	Meat	Asthma and breathlessness	Boiled with salt	Oral
<i>Channa gachua</i> Hamilton (Channidae)	Ikan	Meat	Increase wound healing	Concocted with <i>Zingiber officinalis</i> 's rhizome and <i>Allium cepa</i> 's bulb	Oral
<i>Channa striata</i> Bloch (Channidae)	Ikan Haruan	Meat	Increase wound healing	Cooked	Oral
<i>Hystrix brachyura</i> L. (Hystricidae)	Landak	The black part of the quill	Asthma	Charred and concocted with oil	Topical
		Gall	Breathlessness	Dried and infuse with water	Oral
		Faeces	Stomach diseases	Dried	Oral
<i>Manis javanica</i> Desmarest (Manidae)	Tenggiling	Meat	High fever	Cook	Oral
		Scale	Diseases caused by exposed to sun shower	Raw	Worn as charm
<i>Nycticebus coucang</i> Boddaert (Lorisidae)	Kokang	Fur and bones	Wound	Comminute or raw	Poultice
<i>Python brongersmai</i> Stull (Boidae)	Ular Ipong or Ular Tesang	Meat	Cold	Skinned, cut, and cooked	Oral
<i>Python reticulatus</i> Schneider (Boidae)	Ular Sawa	Gall	Various diseases including hypertension	Dried and infuse with water	Oral
<i>Ratufa bicolor</i> Sparrmann (Sciuridae)	Tupai Mengas	Liver	Breathlessness	Dried	Oral
<i>Rhinoplax vigil</i> Forster (Bucerotidae)	Burung Tekok	Casque	Detect poison	Raw	Made into ring
<i>Scolopendra</i> sp. (Scolopendridae)	Lipan Api	Meat	Asthma and breathlessness	Skinned and grilled	Oral
<i>Termes</i> sp. (Termitidae)	Sarang Anai-Anai	Nest	Fertility	Raw (without termites)	Topical

tes (Rukayah 2006; Samy et al. 2009), where for example, the Malays took the decocted or fresh leaf orally specifically to treat hypertension (Ong and Nordiana 1999; Ong and Norzalina 1999) or the infusion of the whole plant for hypertension, diabetes, and fever (Ong et al. 2011b). Meanwhile, *Parkia speciosa* which is used for diabetes and hypertension in this study is also used for treating diabetes in Malaysia (Ong and Norzalina 1999; Faridah and Shamsul 2004; Samy et al. 2005). In comparison, a recent study by Ong et al. (2011a) showed that even among the Temuan tribe, there exists a very different utilization of natural resources in treating ailments where, only seven species of plants are used by both villages namely *Cheilocostus speciosus*, *Globba patens*, *Labisia pumila*, *P. speciosa*, *Phyllagathis rotundifolia*, *P. bullata*, and *Zingiber officinale*; where all of them are used in treating different ailments in both Temuan villages. For example, *P. speciosa*'s root is used in treating toothache in Jeram

Kedah village, whereas in Ulu Kuang it is used for hypertension and diabetes even though it holds the same vernacular name in both villages, *Petai*. This shows the diverse knowledge of the Temuan tribe where even between neighbouring states in Malaysia, the differences of the same natural resources utilization can be seen clearly. The result also shows that the villagers in Ulu Kuang village still retained their knowledge and utilization of natural resources where they still relied on them in treating conditions from wound and fertility to chronic diseases such as hypertension, diabetes, asthma, and congestive heart failure. The importance of natural resources to the villagers could also be noted from their utilization of natural resources for the ailments related with their beliefs where some of the species are worn as necklace (*Amauroderma* sp.) for babies who cry late at night, or charm (*Manis javanica*) to avoid diseases from sun shower, or made into ring and worn in detecting poison (*Rhinoplax vigil*).

CONCLUSION

The knowledge of the Temuan people should be appreciated so that the knowledge and natural resources that they use can be conserved and utilized in the future. Further studies however are needed in order to determine the chemical constituents in the natural resources mentioned in the results for its efficacy in treating the ailments respectively and thus can be used in producing the medicine in treating the ailments mentioned in the results.

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REFERENCES

- Chang YS, Lee SS 2003. Utilization of wild mushrooms by the Temuans in Selangor, Malaysia. In: HM Azmy, HP Parlan, I Shamsudin, YMY Safiah, HF Lin et al. (Eds.): *Tropical Forestry Research in The New Millennium: Meeting Demands and Challenges*. Kuala Lumpur: Forest Research Institute, pp. 488-489.
- Faridah H, Shamsul K 2004. *A Guide to the Common Plants of Ayer Hitam Forest Selangor, Peninsular Malaysia*. Serdang: Universiti Putra Malaysia Press.
- Fix AG 1995. Malayan paleosociology: Implications for patterns of genetic variation among the Orang Asli. *Am Anthropol*, 97: 313-323.
- Johor Biotechnology and Biodiversity Corporation 2007. *Khazanah Endau Rompin: Herba*. Kuala Lumpur: Utusan Publication.
- Lee SS, Chang YS 2007. Ethnomycology. In: EBG Jones, KD Hyde, S Vikineswary (Eds.): *Malaysian Fungal Diversity*. Kuala Lumpur: Mushroom Research Centre, University of Malaya and Ministry of Natural Resources and Environment Malaysia, pp. 307-318.
- Lim LS, Ang KC, Mahani MC, Shahrom AW, Md-Zain BM 2010. Mitochondrial DNA polymorphism and phylogenetic relationships of Proto Malays in Peninsular Malaysia. *Journal of Biological Sciences*, 10(2): 71-83
- Ong HC, Nordiana M 1999. Malay Ethno-medico botany in Machang, Kelantan, Malaysia. *Fitoterapia*, 70: 502-513.
- Ong HC, Norzalina J 1999. Malay herbal medicine in Gemencheh, Negeri Sembilan, Malaysia. *Fitoterapia*, 70: 10-14
- Ong HC, Chua S, Milow P 2011a. Ethno-medicinal plants used by the Temuan villagers in Kampung Jeram Kedah, Negeri Sembilan, Malaysia. *Studies on Ethno-Medicine*, 5(2): 95-100
- Ong HC, Ruzalila BN, Milow P 2011b. Traditional knowledge of medicinal plants among the Malay villagers in Kampung Tanjung Sabtu, Terengganu, Malaysia. *Indian Journal of Traditional Knowledge*, 10(3): 460-465
- Rukayah A 2006. *Tumbuhan Liar Berkhasiat Ubatan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Samy J, Sugumaran M, Lee KLW 2005. *Herbs of Malaysia: An Introduction to the Medicinal, Culinary, Aromatic, and Cosmetic Use of Herbs*. Selangor: Times Edition.