The Diversity Of Medicinal Plant Resources In Kampung Batu Ring-Kampung Beng: A Case Study Of Lenggong Valley, World Heritage Site

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This ethnomedical survey was conducted in Kampung Batu Ring, part of the small villages included in Kampung Beng, a village commercialized and well known as one of the Homestay villages established in Lenggong District, Hulu Perak. The documentation focuses on the diversity of medicinal plants, its use and dependency of people in Kampung Batu Ring on herbal remedies. The richness of the biodiversity and cultural heritage of Kampung Batu Ring makes it more attractive as a potential traditional village to be commercialized in the tourism aspect. Geographically, it is located in the Piah Reserve Forest valley and mountains in the mid of Banjaran Titiwangsa. Data was obtained from the villagers of fifty most common wild plant species used in daily life in terms of cooking and healthcare. Most of the herbs used are harvested from the forests and being planted around their homeland. The remedies are used internally and externally for treating various ailments from common stomach ache to severe high blood pressure and diabetes. There are several species being consumed as salads especially those which are renown for anti-aging purposes. The practices on the utilization and consumption of these plants in the daily life of the villagers are traditionally transmitted from their great ancestors. Thus, these plant benefits are found to be well known amongst the elderly.

Key words: medicinal plants, remedies, consumption, villagers, Kampung Batu Ring

Introduction

Malaysia has been classified as one of the 12 mega diversity countries of the world. Thus, this signifies for the richness in diversity of wild natural resources in Malaysia's tropical rainforest and useful to be consumed by humankind. The application of wild plants as natural remedies was also practiced since time immemorial. However, the availability and benefit obtained from the wild natural resources are vast amongst the people living in rural areas as compared to the urban people that prefer to live in cities complete with various facilities (Samuel et al., 2010). It has been stated that the dependency of human on biodiversity is for their livelihood, nutrition and health

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(Payyapallimana, 2009), and being influenced by the economical, availability, facilities and geographical facet (Kumari et al., 2011).

Lenggong Valley is located in Hulu Perak district, about 50km north of Kuala Kangsar, the royal town of Perak. A place well known amongst locals as an archaeological site, Lenggong Valley has been declared as a world heritage site on 30th June 2012 by UNESCO, a worldwide organization for educational, scientific and culture. Besides the archeological popularity, Lenggong Valley is also known as a lush landscape profuse with rare and exotic flora diversity.

Geographically, Kampung Batu Ring is one of the sub villages making up the traditional village of Kampung Beng, and being isolated from other villages by Sungai Perak (Figure 1). Readily available and culturally important natural resources are an important source of livelihood for the rural population. The treasure trove inhabiting Kampung Batu Ring especially medicinal plant resources is still little known.

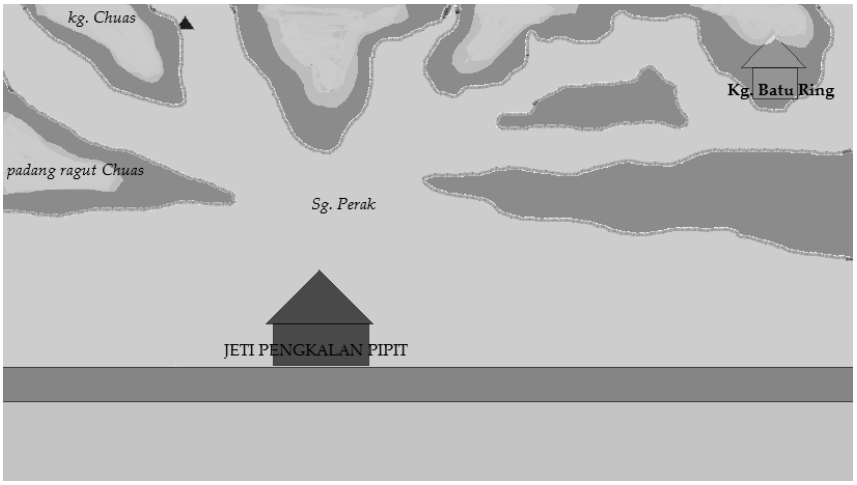

Figure 1: Geographic location of Kampung Batu Ring-Kampung Bang

Medicinal Plants

Medicinal plants form an important component of the rainforest biodiversity. They are the major component of traditional and herbal medicines and are more recently known as medicinal products. Medicinal plants are therapeutic resources much used by the traditional population of the world specifically for the health care. The plants are indeed used by many groups, mainly pharmaceutical and food industries, traditional or alternatives practitioners, folk or household users, and cosmetic and flavour industries (Rates, 2001). These plants are exploited traditionally, for remedy purposes alternatively for human healings and modernly, known as pharmaceuticals (Vandebroek et al., 2004) for resources of new drugs.

Traditional medicine defined as sum of remedy theories in old folk's practices, knowledge and skills, is based on experiences and beliefs diversified according to cultures, religions and philosophies for health maintenance, disease prevention and healing purposes (WHO, 2003). Traditional medicinal practices are common amongst all ethnics in Malaysia including Malays, Chinese, Indians and aborigines; and it is particularly hoped that the knowledge is passed down through many generations. In modern medicine or pharmaceutical formulation, the phytochemical and allopathic constituents derived from the plants are processed industrially and commercially

(Raskin et al., 2002). WHO has also emphasized and provided guidelines to ensure the quality control of medicinal plant products using modern methods.

Generally, medicinal plants are from herbs and woody plants. A report by Khatijah (2006) recorded that there are 1200 plants found in Malaysia that carries the medicinal or pharmaceuticals values. According to Food and Agriculture Organisation (FAO) statistics, Malaysia has a total of 15,500 plants in nature rich of medicinal properties and yet, only 7.7 % of the plants are exploited worldwide. All parts of the plants have own benefits for treating various ailments based on their percentage of phytochemical and allopathic constituents (Fasihuddin & Ghazali, 2003).

Medicinal plants can be used in two different forms. Firstly, as raw materials for extraction of active compounds or for extraction of abundant but inactive constituents which can be transformed by partial synthesis into active compounds. Secondly, as extracts or as traditional preparations. Plants produce chemical compounds naturally as part of their metabolic reaction. These chemical compounds are divided into primary metabolites such as fats and sugars, and secondary metabolites such as toxins, allelochemicals, phytoalexins, pheromones and many more. The most common phytochemicals used for human remedy are from the secondary metabolites of the plants which may be used directly, extracted or as agents for the synthesis of drugs.

Medicinal plants and their products have taken on increasing medicinal and economic importance. Lack of knowledge in medicinal plants has caused several loses economically and environmentally as reported in Klias Peat Swamp Forest in Sabah, Malaysia by Mojiol et al. (2010). For this reason, this preliminary study aims to record the medicinal plant resources at Kampung Batu Ring-Kampung Beng, especially those species used as traditional remedies. Information gathered will be reviewed and conserved for the coming generations of the community and tourists of Lenggong Valley alike.

Methodology

The easiest way of getting to the strategic location of Kampung Batu Ring-Kampung Beng in Lenggong Valley is by crossing Sungai Perak. It took approximately 20 calm minutes by punting (boating in a punt or *sampan*) from Pangkalan Pipit Jetty to berth by the jetty at Kampung Batu Ring-Kampung Beng. The study was conducted via interactive, spontaneous communication and also formal interviews with twenty five villagers of Kampung Batu Ring-Kampung Beng. Respondents from all walks of life, ranging from 15 to 80 years of age were randomly approached. Most of the common medicinal herbs were easily commented upon by the older generation. The diversification of the plant resources was observed and recorded by touring around the village and surrounded forests.

Result And Discussion

The demographic data of the twenty five respondents from Kampung Batu Ring-Kampung Beng is shown in Tables 1a-e based on gender, marital status, age, education level and occupation respectively. Most respondents have gone through primary and secondary education with majority occupation as a rubber tapper.

Table 1a: Respondents based on gender

Gender	**No. of respondents**
Male	9
Female	16
Total	25

Table 1b: Respondents based on marital status

Status	**No. of respondents**
Married	6
Single	17
Total	25

Table 1c: Respondents based on age

Age Range	**No. of respondents**
< 20	2
20-29	4
30-39	4
40-49	1
50-59	9
>59	5
Total	25

Table 1d: Respondents based on education level

Level of Study	**No. of Respondent**
Primary school	10
Secondary school	12
Higher education	2
No education	1
Total	25

Table 1e: Respondents based on occupation

Field of Work	**No. of respondents**
Rubber tapper	13
Cleaner	2
Housewife	7
Student	2
Private sector	1
Total	25

In the study conducted, we have successfully categorized the common 50 species known to possess medicinal properties (information from respondents) into 32 families (Table 2). Most of the plants were observed spreading naturally along the house compounds as tall trees, herbs or shrubs, or growing wildly in surrounding forests (Figure 2).

All the plants recorded are utilized by the locals. Parts of the plants that will be harvested are normally the shoot, flower, leaf, bark, rhizome or the whole plant. These plants are mostly consumed in their daily life as salad followed by as spices and improving healthcare. The villagers use the plants to cure several ailments encountered such as fever, wounds, aches, diarrhea, measles, high blood pressure,

diabetes, gallstone, anti-aging and maternity healing. Parts of shoots and leaves are commonly taken orally to curb diabetes, high blood pressure, gallstones and many more through decoction of the plant parts. The plant parts are also applied externally especially for external injuries or to stop bleeding caused by wounds.

The knowledge on the medicinal properties of these plant parts in treating various ailments was much grasped from the elders especially those who are the village descendants, as opposed to the youngsters. The reasons for the knowledge differences between the older and younger generations may be due to issues of migration, modernization, technology development and lifestyle. The young generations nowadays are mostly not knowledgeable on traditional plant remedies as they are more contented with modern facilities especially in terms of healthcare (Ong et al., 2011). Practices on application of traditional remedies for healthcare, as observed from the study area, are more preferred and appreciated by the older community. This precious knowledge arguably will become a waste, fade and forgotten as time goes by because eventually, the old generation dies without having the opportunity to pass on to non-existent interested parties.

Table 2: Herbal plants used by the villagers of Kampung Batu Ring-Kampung Beng

No	Local name	Scientific name	Family	Part used	Medicinal practices
1	Ara	*Ficus sp*	Moraceae	Fruit	Bait, Salad
2	Asam gelugor	*Garcinia cambogia*	Clusiaceae	Fruit	Spices, Ulcer, Maternity
3	Bambu	*Azadirachta indica*	Meliaceae	Leaf	High Fever, Measles
4	Batu jin	*Strobilanthes crispa*	Acanthaceae	Leaf	Gallstone, Diabetes
5	Beka / Berelai	*Oroxylum indicum*	Bignoniaceae	Leaf Fruit Bark	Fever, Gastric, Ulcer **potential anti-cancer*
6	Capa	*Blumea balsamifera*	Asteraceae	Leaf	Fever, Stomach ache, Head ache, Gallstone, High blood pressure, Gout, Maternity
7	Cekur manis	*Sauropus androgynus*	Phyllanthaceae	Leaf	Fever, Ulcer
8	Duit-duit	*Pyrrosia piloselloides*	Polypodiaceae	Leaf	Gallstone *(thoroughly used with Batu Jin leaves)*
9	Halia	*Zingiber officinale*	Zingiberaceae	Rhizome	Spices, Bloating, Maternity
10	Jambu batu	*Psidium guajava*	Myrtaceae	Leaf	Diarrhea, Rashness, Diabetes, Lowering cholesterol level, Maternity
11	Jarum tujuh	*Pereskia sacharosa/saecnarosa*	Cactaceae	Leaf	High blood pressure, Diabetes

12	Jenjuang	*Cordyline terminalis*	Agavaceae	Whole plant	Fever, Stomach ache, Head ache, Gout, Urine difficulty
13	Kacip fatimah	*Labisa pumila*	Myrsinaceae	Root	Energy booster
14	Kaduk	*Piper sarmentosum*	Piperaceae	Leaf	Salad, Bloating, Maternity
15	Kantan	*Etlingera eliator*	Zingiberaceae	Leaf Flower Stem	Spices, Maternity **antioxidant*
16	Kapal terbang / Malialam	*Eupatorium odoratum / Chromolaena odorata*	Asteraceae	Leaf	Wound, Bloating, Diarrhea (baby) **poisonous when used excessively*
17	Kari	*Murraya koenigii*	Rutaceae	Shoot Leaf	Salad, Spices, Diabetes, Stomach ache
18	Keladi kemahang	*Colocasia sp*	Araceae	Rhizome	Cooking
19	Kelompang telur	*Agave angustifolia*	Agavaceae	Leaf	Tooth ache
20	Kesum	*Polygonum minus*	Polygonaceae	Fruit	Salad, Maternity
21	Kunyit hidup	*Curcuma longa*	Zingiberaceae	Leaf Rhizome	Spices, Skin, Maternity **antioxidant anticancer*
22	Kunyit terus	*Zingiber ottensii valeto*	Zingiberaceae	Rhizome	Wounds, Maternity
23	Lempoyang	*Zingiber aromaticum*	Zingiberaceae	Rhizome	Maternity
24	Lengkuas hutan	*Alpinia sp*	Zingiberaceae	Leaf Rhizome	Spices, Stomach ache, Maternity
25	Letup-letup	*Physalis minima*	Solanaceae	Fruit	Salad, Head ache, Waist ache, Sore throat
26	Lidah buaya	*Aloe vera*	Aspholdelaceae	Leaf	Wound
27	Limau kasturi	*Citrus microcarpa*	Rutaceae	Fruit	Head ache, Cooler, Maternity
28	Limau telur buaya	*Citrus sp*	Rutaceae	Fruit	Juice, Maternity
29	Limau nipis	*Citrus aurantifolia*	Rutaceae	Fruit	Scalp care, Spices, Maternity
30	Limau purut	*Citrus hystrix*	Rutaceae	Leaf Fruit	Hair care
31	Mas cotek	*Ficus deltoidea*	Moraceae	Leaf	High blood pressure, Diabetes, Maternity
32	Mengkudu	*Morinda citrifolia*	Rubiaceae	Leaf Fruit	Salad, Diabetes, High blood pressure, Stomach ache, Head ache,

					Gout, Maternity
33	Mertajam	*Erioglossum rubiginosum*	Sapindaceae	Leaf	Wound, Deworming, Cooler
34	Pandan wangi	*Pandanus amaryllifolius*	Pandanaceae	Leaf	Measles, Maternity
35	Pegaga	*Centella asiatica*	Mackinlayaceae	Leaf	Salad, Gallstone, Polycystic kidney disease, Ulcer, High blood pressure **anticancer*
36	Putat laut	*Barringtonia asiatica*	Lecythidaceae	Shoot Leaf Fruit Bark	Salad, Skin diseases, Cooler, Sinus, Blood circulation
37	Ros hutan	*Rosa canina*	Rosaceae	Shoot	Salad
38	Rosel	*Hibiscus sabdariffa*	Malvaceae	Leaf Flower	Salad, Drinks
39	Samak serai	*Eugenia polyantha*	Myrtaceae	Shoot Leaf	Salad, High blood pressure, Diabetes **antioxidant Anti-tumor*
40	Selaput tunggul / Ulan gila	*Mikania micrantha*	Asteraceae	Leaf	Wound, Stomach ache, Insect bites
41	Senduduk	*Melastoma sp*	Melastomataceae	Leaf	High blood pressure, Diabetes
42	Senia	*Ficus hispida*	Moraceaea	Leaf	Salad, Decoction of fish
43	Sentang	*Azadirachta excelsa*	Meliaceae	Shoot Leaf	Diabetes
44	Serai wangi	*Cymbopogon nardus*	Poaceae	Leaf	Spices, Head ache, Bloating, Maternity
45	Seringai	*Flemingia strobilifera*	Fabaceae	Leaf	Maternity, Stomach ache (baby)
46	Setawar	*Kalanchoe pinnata*	Crassulaceae	Leaf	Fever, Maternity
47	Sirih	*Piper betle*	Piperaceae	Leaf	Diarrhea, Blood clotting, Maternity
48	Temu	*Curcuma sp*	Zingiberaceae	Rhizome	Maternity
49	Tepos gajah	*Beaucarnea recurvata*	Asparagaceae	Leaf	Maternity
50	Tongkat ali	*Eurycoma longifolia*	Simaroubaceae	Root	Energy booster

Generally, however the community in this rural area was aware on the diversity of the medicinal plants specifically traditional herbs which are found in abundance. The reason is probably due to lack of modern medical support. Thus, in this unfavorable condition the people will tend to use natural medicinal plants as an alternative source of therapeutic for their primary healthcare (Kumari et al., 2011). According to the villagers, there are several plant species deteriorating in numbers because of continuous harvesting by traditional healers. Over exploitation of the

medicinal plants will sooner or later cause an extinction of the species and plant genetic resources. Obviously without practicing the sustainable way of harvesting, the existence of plant species may severely be affected (Sharif et al., 2007). The dependency on these natural resources as medicines should be more diverse and not depending on the same particular plants. Thus, preservation of the plant species is a crucial measure to conserve and protect the plant from extinct (Kulip et al., 2010).

Priority on conserving the nature to prevent extensive destruction of the habitats, species extinction and also continuation of knowledge and information regarding the natural resources of Kampung Batu Ring was in turn advised to the community.

Conclusion

Great dependency of the humankind on biodiversity of the forests signifies that Kampung Batu Ring-Kampung Beng at Lenggong Valley is suitable as the site for plant diversification research. In addition, Lenggong Valley was one of the places considered as a disturbed forest. Gobilik (2008) related this kind of place with high diversity of plants specifically traditional medicinal species.

The survey has revealed a rich diversity of ethno-medicinal practices by the villagers of their natural flora in and around the Kampung Batu Ring. The plants were easily harvested as they diversely available throughout the village land. Thus, knowledge on conserving the plants was informed to the villagers as crucial. This is to sustain the wild species present in the area because overharvesting will make the species becoming extinct or rarely to be found in the future.

The study also showed that the practices on application of the medicinal plants in their daily life as remedies were generally dominated by the elderly. This vast knowledge on ethno-medicinal plants will be a waste if it is not being practiced by the younger community. The uses as remedies should be known as one of Lenggong Valley's ultimate heritage and tradition that need to be passed from ancestor to future generation, to be preserved and remain eternal.

As a conclusion, the findings of this study have revealed a respect to the rights, traditions and practices on the medicinal plant resources amongst the local community of Kampung Batu Ring-Kampung Beng at Lenggong Valley, World Heritage Site.

(a) Senia

(b) Batu Jin

(c) Setawar


(d) Capa


(e) Kunyit Terus


(f) Limau Telur Buaya


(g) Tepos Gajah


(h) Jenjuang

Figure 2: Some of the medicinal plants found in the village of Kampung Batu Ring-Kampung Beng

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