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The preliminary study of herbal rice plants in Pulau Tioman, Pahang, Malaysia

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Abstract

The herbal plant status in Pulau Tioman is unknown, and may be reduced due to extensive recreational activities in Kg. Tekek Waterfalls. The main objective of this preliminary survey is to assess the varieties of herbal plants that are found at Pulau Tioman, Pahang. Herbal plant survey was carried out in a transect of 5-meter width on both side of the 1 km main track connecting Kampung Tekek Jetty to Kampung Tekek Waterfalls. A total of seven species namely, *Dracaena umbratica, Flagellaria indica, Selaginella willdenowii, Ixora javanica, Lygodium microphyllum, Melastoma malabathricum* and *Cassia alata* which belong to seven (7) families namely Asparagaceae, Flagellariaceae, Selaginellaceae, Rubiaceae, Lygodiaceae, Melastomataceae and Leguminosae were collected, identified and reported. The list of plants recorded could be included in a datasheet for the study of plants with medicinal value and the distribution data could be used to update the IUCN and CABI database.

1. INTRODUCTION

Siamese communities are known as herbal consumers, they consume herbs for their medicinal value and for the nutrition. Food has been the biggest need in daily life not only for Siamese community but also for all life forms. Among humans, healthy and nutritional food has been the basic requirement. Healthy and nutritional food provides a balanced dietary intake of vitamins, protein, fat, energy, calories, and antioxidant compounds (Prior & Wu, 2013; Stipanuk & Caudill, 2013). Not only that, healthy and nutritional food contain antibacterial, anticarcinogenic, anti-fungal and other medicinal compounds concerning to health maintenance (Geybels *et al.*, 2013; Muruganantham *et al.*, 2016; Vazhacharickal *et al.*, 2015). These compounds even though can be found in most organic food sources, plant source has been regarded as the best in terms of the quality and quantity of the compounds acquired. This has been proven in traditional practice as most of the traditional healer or medicine practitioner use mostly plant parts as ailments for curing illnesses (Appalasamy *et al*., 2014; Bunalema *et al.*, 2014; Rahmatullah *et al.*, 2013; Tolossa *et al.*, 2013; Vijayakumar *et al.*, 2015; Appalasamy *et al.*, 2019).

Traditional medicine has been regarded as the basis of all modern medicine as it serves as a platform where researchers looks to in discovering medicinal source or ideas to explore in new medicine development (Pan *et al.*, 2013). As such, many cultures throughout the globe have their respective traditional medicine practice which sometimes coincides and also contradicts with other cultures. One of such culture is the Siamese community of Kelantan, Malaysia. The Siamese community has long been adapted to the culture and lifestyle of the local community. When they prepare their food, local herbs become an important ingredient and the famous food which uses herbs as the main ingredient is herbal rice. Herbal rice is a healthy and nutritional form of rice which is being consumed at least once a month by the Siamese community in Kelantan. The herbal plants used to prepare this herbal rice are usually collected from the surrounding area of their neighbourhood and from their gardens. However, the current generation and other communities are not well aware of these herbal plants and their importance. The traditional knowledge involving the usage of herbal plants in herbal rice preparation will become extinct if it is not well recorded. Hence, this study is conducted to survey the presence of herbal plants used in herbal rice preparation in Pulau Tioman, Pahang.

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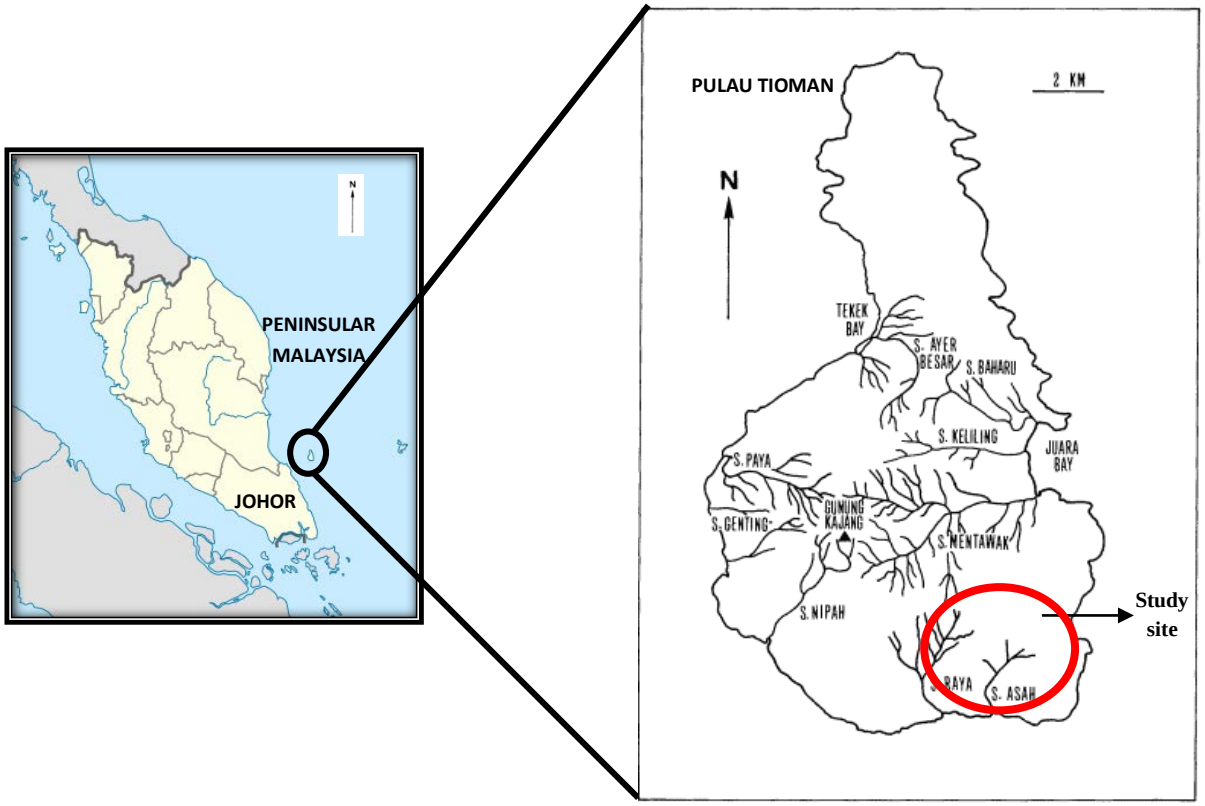

Figure 1: Map of Pulau Tioman, Pahang, Malaysia adapted from Appalasamy *et al.* (2018). The red circle encircling Sungai Asah which goes through Kampung Tekek. This area is the study site for this herbal rice plant observation.

2. MATERIALS AND METHODS

Herbal plant survey was carried out on 14-17 April 2016 during the Scientific Expedition organised by the Department of Wildlife and National Parks, Malaysia. The preliminary survey was conducted in transect of 5 meter width on both side of the 1 km main track connecting the jetty at Kampung Tekek to Kampung Tekek Waterfalls, Tioman (Figure 1). The identification was verified by the botanist at Forest Research Institute of Malaysia (FRIM) who also participated in the expedition. All identified plants were then compared with the plants collected in the Siamese villages in Kelantan namely Kubang Panjang, Kampung Kuang and Kampung Mentua.

3. RESULTS AND DISCUSSION

A total of seven species namely *Dracaena umbratica, Flagellaria indica, Selaginella willdenowii., Ixora javanica, Lygodium microphyllum, Melastoma malabathricum* and *Cassia alata* which belong to seven 7 families namely Asparagaceae, Flagellariaceae, Selaginellaceae, Rubiaceae, Lygodiaceae, Melastomataceae and Leguminosae were collected, identified and reported. The plants were listed in order of family, botanical name, vernacular name (EN: English name, SN: Siamese name and MN: Malay name), description and uses are given below.

[F: Flagellariaceae] *Flagellarian indica* L. (EN: False Rattan, SN: Wai Ling, MN: Rotan dini) found growing in wild bushes (Figure 2). Their stems are rigid and usually climb on the bushes. They produce small-sized pink fruits. Leaves are traditionally used as cardiotonic, antenatal care and rhizome are used as atreatment for fever, malaria and jaundice (Neamsuvan *et al.*, 2012).

Figure 2: *F. indica* showing the climbing stem and leaves and pinkish fruits.

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[F: Lygodiaceae] *Lygodium microphyllum* (Cav.) R. Br. (EN: Climbing Maidenhair Fern, SN: Rebunyung, MN: Pakis ribu-ribu) is a fern (Figure 3). It is mostly found near rivers where the soil is moist with bushes which allow this plant to climb for support. It has few traditional medicine uses. It can be used to treat dysentery, skin disease and swelling (Panda *et al.*, 2011; Rout *et al.*, 2009).

Figure 3: *L. microphyllum* showing a few pinna

[F: Melastomataceae] *Melastoma malabathricum* L. (EN: Singapore rhododendron, SN: Khering, MN: Senduduk) are common shrubs with brown-red soft stem and leaves with rough surface due to minute hair-like structures (Figure 4). The flowers are purple and they are bulb-shaped with reddish surface. It is used traditionally in treating diarrhoea, dysentery, wound healing, post-partum treatment puerperal infection, leucorrhoea and haemorrhoids (Susanti *et al.*, 2008).

Figure 4: *M. malabathricum* showing the flower and

leaves.

[F: Selaginellaceae] *Selaginella willdenowii* (Desv.) Baker. (EN: Lesser Clubmoss, SN: Wew Nok Jung, MN: Pakis merak) are fern-like plant with greenish-blue fronds (Figure 5). It has been utilised as treatment for wound, menstruation, uterine disorder, internal injuries, heat stroke and jaundice (Antony & Thomas, 2011; Ganeshaiah *et al.*, 2009).

Figure 5:*S. willdenowii* showing the fronds.

[F: Asparagaceae] *Dracaena umbratica* Ridl. (EN: - , SN: Khe Niau Besang, MN: Pandan serani) is a shrub with dark green leaves and white flowers (Figure 6). The stems are rigid and can grow to a height of 1.5 m tall. The root portion was known to be useful in treating rheumatism (Zuki *et al.*, 2012).

Figure 6: *D. umbratica* showing the habit

[F: Leguminosae] *Cassia alata* L. (EN: Candle bush, SN: Chum Het, MN: Gelenggang besar) is an erect syrub (Figure 7). It is known to grow up to 8 m high. The flowers are yellow and orange. The leaves are bilateral-symmetrical, while the seeds are enclosed in a pod. The leaves of the plant are traditionally used to treat ringworm, skin diseases, eczema, scabies, ulcer, inflammation and fungal infection (Agnaniet *et al.*, 2005; Ogunwande *et al.*, 2010; Okwu & Nnamdi, 2011; Phongpaichit *et al.*, 2004).

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Figure 7: *C. alata* showing the leaves and flowers.

[F: Rubiaceae] *Ixora javanica* DC. (EN: Flame of woods, SN: Khem Deng, MN: Bunga siantan) a common shrub (Figure 8). It can grow up to 3 m tall. Bracts are light orange-pink. The flowers look is like needles in shape. It has globose fruits and red-green. The plant is essentially used to treat skin diseases, flatulence, inflammation, diarrhoea, indigestion, ulcer, headache, hypertension, dysentery and cancer (Akter *et al.*, 2015; Dontha *et al.*, 2015; Kharat *et al.*, 2013).

Figure 8: *I. javanica* showing the inflorescence, leaves and fruits

The seven plants identified in the Kampung Tekek of Tioman Island were found to be similar to the plants that are traditionally used by Siamese community of Kelantan. The uniqueness of the plants being utilised by the Siamese community is that, they consume these plants as a part of their diet in the form of herbal concoction. The community believe that, the plants has good health benefit, thus the consumption of these plants ensures their well-being. As such, the presence of the plants in Kampung Tekek shows the plants are highly available in various geographical locations. It also means that local community in the Tioman Island could utilise the plants for similar health benefit. It serves as a natural resource for healthy lifestyle. It is also possible that the local community of Kampung Tekek might have some traditional knowledge of this plant on its uses. Future exploration on their traditional uses might unveil new possibilities of their uses.

4. CONCLUSION

This survey provides additional information to be included in the herbal plants database for future study on the distributions of herbal plants used by Siamese community to prepare herbal rice as well as to unveil more substantial evidence on the nutritional value of the plants being consumed. In addition, these plants have the potential to treat some severe diseases such as cardiovascular disease, diabetes, cancer, gonorrhoea, tuberculosis as well as other illnesses. There are scientific gaps that can be further studied to improve as well as create better nature based medication in combating health related problems faced by the human population.

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