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Biodiversity across boundary: Ethnoentomology among the Jakun of Kampung Peta, Mersing and the Malay, Chinese and Indian of Kahang, Kluang, Johor

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Abstract. An ethnoentomological survey was carried out on the usage of insects in the culture of several ethnics: Orang Asli Jakun in Kampung. Peta, Mersing; the Malay, Chinese and Indian in Kahang, Kluang. Responses from these four communities were compared to understand the uses of insects in their life as well as gauged their views on ethnoentomology. Insects were either part of their spiritual beliefs or used as food, medicine, and entertainment. Four groups of insects were considered, namely Lepidoptera, Homoptera, Odonata and Orthoptera. For example, *Dundubia vaginata* is used by Orang Asli as a source of food, by Malay as entertainment, by Chinese as medicine and by Indian as part of their beliefs. In terms of percentage of insect recognized per ethnicity, Orang Asli accounts for 44.44%, Malay 22.22%, Chinese 16.67% and Indian 16.67%. It was discovered that among the four communities, Orang Asli Jakun were more knowledgeable and open about using insects traditionally. Many insects were integrated in their folklore and myths. Orang Asli Jakun also had more variety of uses for insects in their day to day life compared to the other three communities. Based on this study, it indicated that much of the Malaysian diversity are known and familiar to Orang Asli. Throughout history, Orang Asli plays important roles in maintaining and managing natural resources through traditional systems. The frequency of human interaction with insects has created a close culture between humans and insects.

1. Introduction

Malaysia is a mega-biodiversity country housing a wide variety of plants and animals made possible by the tropical climate. Insects are a collection of life that covers half the species on the surface of this earth [2]. They have lived alongside humans since the beginning of human existence on earth; that they are virtually embedded within the culture of different communities. Culture is a behavior developed within a society and formed through social learning. It is also something that is repeatedly practiced in everyday life that it becomes the habit of community groups [3]. Ethnoentomology tries to explore the relationship between humans and insects, mainly among the indigenous people [4]. It is known that indigenous



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people are more knowledgeable about the natural world surrounding them. Usually, this knowledge is passed from one generation to another through oral communication, songs, dances or rituals. Over the last few decades, ethnoentomology has evolved into a discipline that studies the people-insect relationship in different aspects of life such as food, medicine, entertainment or spiritual beliefs [4].

In addition, some cultures also use insect for their medicinal benefits. The use of insects in medicine is defined as entomotherapy [5]. Entomotherapy is not something new; it has been practiced since the beginning of human civilization. Compared to other countries, Malaysia is still lacking in terms of the use of these insects in life [6]. Insects are also used as entertainment, games and beliefs as well as a variety of other uses. This study wishes to compare the usage and influence of insects on the daily life of different ethnics/communities in Malaysia. It also explores the depth of knowledge on insects of the different cultures.

2. Methodology

The general survey was conducted at Kampung Peta, Mersing (2°32.359' N; 103°24.833' E) and Kahang, Kluang (2°12'56.5" N; 103°32'24.9" E) in the state of Johor, Malaysia. The two study sites were chosen to allow comparison between the different cultures that exist within the same geographical region. The population of Kampung Peta consists of Orang Asli from the Jakun tribe, one of the 19 subtribes of indigenous people in Peninsular Malaysia [1]. Whereas Kahang is home to typically Chinese, Indian and Malay population; a general composition that is found spread across Malaysia. The location of Kampung Peta 86900 Mersing Johor and Kahang 86700 Kluang Johor, is shown in Figure 1.

The preliminary survey was done through face to face interviews with respondents. The number of respondents were as follows: Jakun tribe – 20 individuals, Malay -20, Chinese – 20 and Indian – 20. Total respondents were 80 people, 10 men and 10 women from each community. A series of questions were asked to test their ability to name and identify common insects and to explore the usage of insects in their culture. The interview was conducted according to the comfort of respondents; usually in the evening as they rest at the store and at work for the Malay, Chinese and Indian communities. While Orang Asli, night time is perfect for their interview. Photographs and illustrations from books of the four insect group chosen were used to assist in the interviews to facilitate respondents in identifying the names of insect groups. The insect groups were normally identified and called by their local names which were recorded using the spelling system of the Malaysian language. The lowest possible taxon endeavored by researchers was the taxon family. Lower taxon such as genus or species was not possible to be identified by common Malaysian. Vernacular names to differentiate these insects are recorded as being mentioned by the respective respondent. For the researcher's identification purposes, several books were used such as Barlow (1982), Holloway (1987) and Orr (2005).

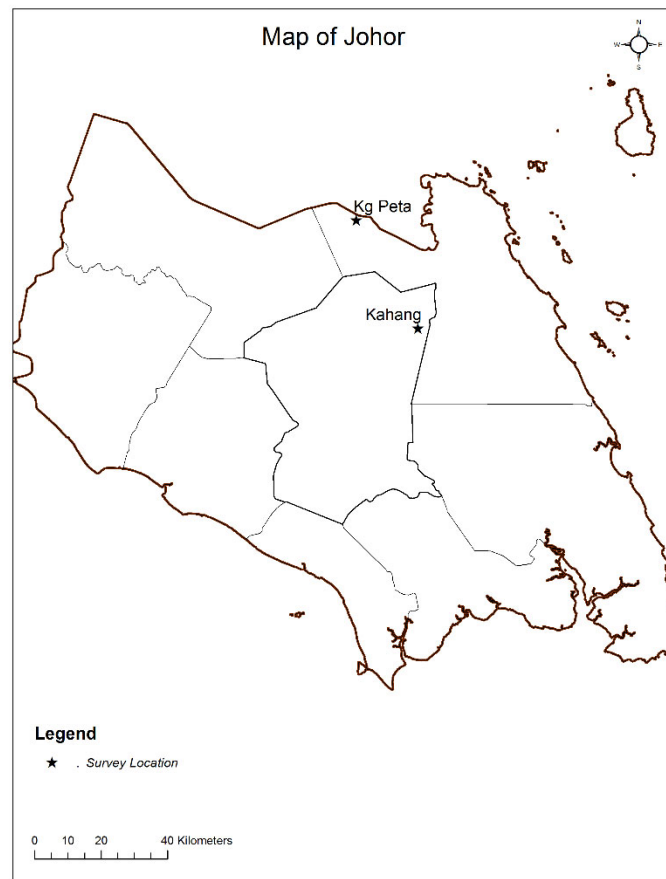


Figure 1. Location of Kampung Peta 86900 Mersing and Kahang 86700 Kluang in Johor.

3. Results

The majority of Orang Asli (Jakun of Kampung Peta) interviewed were able to correctly identify and name the selected insect, at the order level. They were also able to thoroughly provide different usage of the insects. Comparatively the Malay, Chinese and Indian were not able to correctly identify the insect. Generally, the Malay, Chinese and Indian of Kahang town were not able to recognize the insects shown to them and some say they have never seen these insects before. Some of the Malay, Chinese and Indian respondents showed minimum to no interest in insects and are not able to give any input. The common names provided by respondents for each of the insect groups are recorded. Table 1 shows the names of the insects in the language of the different communities.

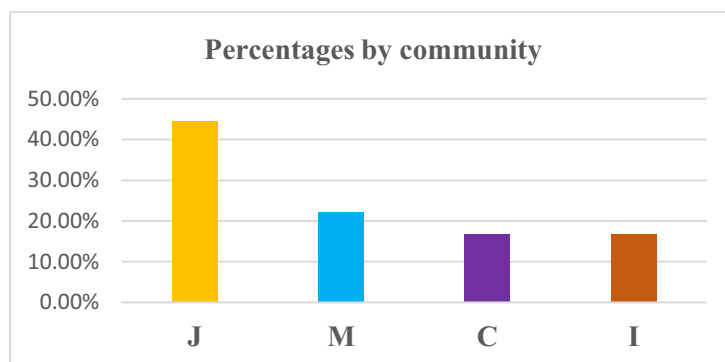


Figure 2. Percentage of recognized insect and their usage by community. J – Orang Asli tribes Jakun, M – Malay, C – Chinese, I – Indian

3.1. Insect as food source

Entomophagy, the practice of eating insects is common worldwide [7]. The method of preparation depends on individual preference on whether to roast, fry without oil, boil, or eat raw. Globally, insects play an important role in the history of human nutrition in Africa, Asia and Latin America [8]. Meanwhile in Thailand, entomophagy it is still practiced until now. It was reported that 194 species of edible insects are consumed daily in Thailand [9]. Historical and scientific studies carried out have proven that insects might be one of the most sustainable food sources for humans [10].

Insects are often eaten from ancient times by most of the world's population [11]. In Papua New Guinea insects that are used as seasonal food sources, as was reported earlier [12] by Meyer-Rochow, 1973. They also stated that both immature and adult forms of numerous species of beetles belonging principally to the families Cerambycidae, Curculionidae, Scarabaeidae, Passalidae, and Tenebrionidae were consumed and that long as well as shorthorned grasshoppers and locusts, crickets, mole-crickets, praying mantids, and stick insects were also components of many local diet.

The Australian Aborigines consists of two tribes namely Walbiri and Pintupi made use of a variety of insects and their products and, in particular, ate wood-root, and timber-boring lepidopteran and coleopteran larvae, termites, and sugar-containing species [13]. In New Zealand, the larvae of the *Prionoplus reticularis* species is a source of food; however adult beetles are not consumed. These larvae can be found in damaged woods [14]. *Dundubia vaginata* is a source of food for the Orang Asli community. In addition, insects are also used as bait for fish bait or bird, for example beetle larvae [15].

3.2. Insect in medicine and health

Since ancient times, insects are used as a medical resource in most cultures. Despite the connotation that insects are disgusted and unpleasant [16] (Hall, 1969), many species of insects are used directly or cooked, patched wounds, and also in religious ceremonies [17]. The use of insects in medicine is known as entomotherapy. This is because the medical system is also involved in a cultural system. Therefore, the use of insect-based medicines should be viewed from a cultural perspective. In general insects may not be prominent among the people of this world, but they are known [8]. During the seventeenth century, Europeans believed that many types of insects had healing power [18]. Among examples are people believed oil derived from May beetle, *Melolontha vulgaris* (L.) 1758, could be used to treat scratches, wounds, rheumatic arthritis and mature beetles immersed in wine are useful in treating anemia. Meanwhile the cockroach is crushed for epilepsy treatment; and earwigs are used for ear pain [19].

Although entomotherapy is ancient practice, it is still not well known in the academic world. Holt in 1885 emphasized that the advancement of medical science has been pushing people's knowledge and eliminating the belief in insect quality as a drug [20]. In Brazil, for example, the practice of using insect medicines has been reported since the colonial period [17]. For example they used honey of *Partamona* sp. to treat sore throat. *Tropidacris* spider made into tea had been known to cure skin disease and stroke [17]. While in Mexico, medical doctors Crisenzia Rodriguez Nieves also use stinkbugs to treat goiters,

locusts to treat anemia and bee wax for joint pain. Insects are also used in the southwest of Nigeria, mole crickets are used to treat legged infections. Africa uses insects to heal some diseases, for example *Cubitermes* spp. is used to cure heart disease and *Macrotermes* spp. used for treating malnutrition of children [21], and the mandibles of termites *Termes bellicosus* were used to sew wound [22].

Chinese in Malaysia use stick insects as medicine; it is first dried, mixed with herbs aimed at asthma treatment, abdominal pain and muscle pain [23]. In China, every drug store sells cockroaches as they believe it could stimulate lactation [24]. The same report noted that giving concoction of *Periplaneta* spp. to children lazy going to school; thus ending up cheating (perhaps in exam) apparently solved the problem.

Additionally, insects are also used to maintain health for half the world's population. Entomotherapy is defined as the use of insects in medicine and is not new because it has been practiced since the beginning of time [4]. In Malaysia insects are also use as medicine and also to maintain health. Yet coupled between Malaysia and China, our country is far behind this. The documentation of insects is much done by the Chinese in China compared to our lesser countries. Even the religious factor is also a contradiction in the use of insects [4]. Among the examples of insects used in medicine for Chinese, ant (*Polyrhachis vicina*), is believed to reduce inflammation, fatigue [25], and increase the number of white blood cells in the body against cancer [26]. Documentation and study of chemical compounds found in insects should be further expanded to enable all information to be supported and scientifically proven. It is not impossible that someday the use of insects in medicine is more pronounced than conventional medicine [4].

For the Chinese community in Kahang, they use *Dundubia vaginata* as medicine by mixing it with herbs after the insect is dry. For the Indian community, they believe that these insects are a sign of no sustenance will be obtained on that day. Some insects are used for beauty. In Malaysia the *Erionata thrax* larvae are used to smoothen and whiten the face [15].

3.3. Insect as part of spiritual belief

In the Orang Asli community, when *Lyssa zampa* enters a house, it is believed to be a bad omen indicating danger in the forest. While the Malay community believed that if *Lyssa zampa* entered the house, a distant family would come visiting. For the Chinese and Indians, they believe that *Lyssa zampa* that entered the home was a spirit of the deceased relatives who came to visit them. *Elimaesa* sp. that produced ringing sound in a house the Orang Asli and the Malays have generated a belief that bad things would happen as these insects are associated with magic and ghost. It is also a bad omen for the Indian community. The common dragonfly, *Orthetrum chrysis*; in the Orang Asli community, is regarded as carriers of diseases such as fever and cough, especially when they are in a large number. Dragonfly is also used as a measure of water hygiene [27]. In China, they believe the sound of male cicadas signify rebirth [28].

3.4. Insect in entertainment

Insects are not only used as food and medicines, they are also used as toys, merge in beliefs and for various other uses. In Malaysia, some Malays and Orang Asli used insects for entertainment especially those who lived isolation, far from other people. For *Dundubia vaginata*, Orang Asli regarded them as entertainment for Orang Asli children; likewise for the Malay community. The dragonfly too is also entertaining for Orang Asli children. When its abdomen is tied with a string or thread and released it behave like a kite. The same goes for children of the Malay and Chinese societies.

3.5. Other uses of insects

Other uses for insects include as bait for fishing riverine fishes such as the Tinfoil Barb (*Barbonymus schwanefeldii*). The checklist in Table 2 shows that insects are more commonly used by the Jakun community compared to the others. It plays a huge part in their spiritual and day to day beliefs. Other communities did not use insects as much in their cultural beliefs as it has been forgotten with time.



Figure 3. Photos of some of the respondents. A. Dido Bte Lanau, Age: 67; B Rajesvaran A/L Kesavan, Age: 35 and Kamalrudin bin Adul, Age: 36; C. Kamala Saraswathy, Age: 61; D. Ng Chin Lai, Age: 70 and Ng Soo Hoon, Age: 43

4. Conclusion

Each insect has its own function, embedded in folklore, myths and culture of people. They are used as food, medication for entertainment and other purposes, every day. However, modern lifestyle had eroded this knowledge. While the Orang Asli may still hold on to their belief in insects; many other ethnics had already forgotten most of it. Insects are better known by people more than other animal groups it is because they are world's most populous organisms. They have existed in human culture for so long. Hopefully, with this initial study, it would provide a starting point for next researcher who would like to venture into ethnoentomology.

Table 1. The name of insects in the language of different communities

Language	Taxon / Scientific name				
	Lepidoptera (<i>Lyssa zampa</i>)	Homoptera (<i>Dundubia vaginata</i>)	Odonata (<i>Orthethrum chrysis</i>)	Orthoptera (<i>Elimaea</i> sp.)	
English	Moth	Cicada	Dragonfly	Katydid	
Indigenous People (Jakun) Malay Mandarin	Rerabik	Senderong	Dediyui	Pelesit	
	Rama – rama	Riang – riang	Pepatung	Pelesit	
	Fei'e	Chan	Qing ting	Huang chong	
Tamil	Pattam puchi @ Vannatha puchi	Pachi vindu	Tatan puchi	Pachai venthukili	

Table 2. A checklist of selected insect usage in different communities in Kampung Peta and Kahang

	Lepidoptera (<i>Lyssa zampa</i>)					Homoptera (<i>Dundubia vaginata</i>)					Odonata (<i>Orthethrum chrysis</i>)					Orthoptera (<i>Elimaea</i> sp.)				
	J	M	C	I	J	M	C	I	J	M	C	I	J	M	C	I	J	M	C	I
Food																				
Medicine																				
Spiritual Belief	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Entertainment																				
Others																				

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References

- [1] Jaringan Perkampungan Orang Asli Johor 2018.
- [2] Speight M R, Hunter M D and Watt A D 1999 *Insect ecology: concept & application* (Oxford: Blackwell Science)
- [3] Hidayat R A 2012 *Pendekatan Antropologi Budaya dalam Memahami Perilaku Konsumen: Sebuah Kerangka Konsep Pemikiran* (Jakarta: Universitas Esa Unggul)
- [4] Nurul Ashikin 2015 Ethnoentomologi dalam kalangan kaum Orang Asli dan Melayu di Semenanjung Malaysia. *Master's Thesis*. Universiti Tun Hussein Onn Malaysia.
- [5] Rastogi N 2011 Provisioning services from ants: food and pharmaceuticals *Asian Myrmecology* **4** 103–20
- [6] Chen Y and Alue R D 1994 Ants Used as Food and Medicine in China *Food Insects Newsletter* **7** 2-9
- [7] Chakravorty J, Ghosh S and Meyer-Rochow V B 2011 Practices of entomophagy and entomotherapy by members of the Nyishi and Galo tribes, two ethnic groups of the state of Arunachal Pradesh (North-East India) *J. of Ethnobiology and Ethnomedicine* **7** 321-32
- [8] Bodenheimer F S 1951 Insects as Human Food: A Chapter of the Ecology of Man (The Hague: W. Junk)
- [9] Sirimungkarat S, Saksirirat W, Nopparat T and Natongkham A 2008 Edible product from eri silkworm (*Samia ricini* D.) and mulberry silkworm (*Bombyx mori* L.) in *Humans Bite Back. Thailand* ed Durst P B, Johnson D V, Leslie R N and Shono K (Thailand: Food and Agriculture Organization) pp 151-60
- [10] Durst P B and Shono K 2008 Edible forest insects: exploring new horizons and traditional practices *Proceedings of a Workshop on forest insects as food: Humans bite back* (Thailand: Food and Agriculture Organization) pp 1-4
- [11] Gorham J R 1976 Insects as food *Bulletin of the Society of Vector Ecology* **3** 11-6
- [12] Meyer-Rochow V B 1973b Edible insects in three different ethnic groups of Papua New Guinea *American J. Clinical Nutrition* **26** 673-7
- [13] Wurm S 1971 Classification of Australian Languages including Tasmanian in *Linguistics in Oceania* **8** ed T A Sebeok (Mouton: The Hague) pp 721-778
- [14] Meyer-Rochow V B 1996 Uses of insects as human Food in Papua New Guinea, Australia, and North-East India: Cross-cultural considerations and cautious conclusions. *Eco. Food Nut.* **36** 118-59
- [15] Chung A Y C, Petronella D and John L Y 2005 Ethnoentomological survey of the local community near Meliau Range, Ulu Tungud Forest Reserve Sabah in *Second workshop on biodiversity conservation at Meliau Range, Ulu Tungud Forest Reserve Sabah*
- [16] Hall E T 1969 The hidden dimension (Anchor: Garden City)
- [17] Costa N 2002 The use of insects in folk medicine in the state of Bahia, northeastern Brazil, with notes on insects reported elsewhere in Brazilian folk medicine *Human Ecology* **30** 245-63
- [18] Wigglesworth V B 1976 *Insects and the Life of Man* (New York: Halsted Press)
- [19] Ratcliffe B C 1990 The significance of scarab beetles in the ethnoentomology of non-industrial indigenous peoples in *Proceedings of the 1st International Congress of Ethnobiology* **2** 159-85

- [20] Holt V M 1992 *Why not Eat Insects?* (Kent: Pryor Publications)
- [21] van der Waal B C W 1999 Ethnobiology and uses of grasshoppers in Venda, Northern Province, South Africa. *S. African J. of Ethnology* **22**103-9
- [22] Marie R 1955 Contribution a l'histoire des insectes en the Ârapeutique *Ph.D. Dissertation* (Strasbourg: Strasbourg University)
- [23] Boyle R H 1992 The joy of cooking insects *Audubon* **94**100-3
- [24] Lenko K and Papavero N 1996 *Insetos no folclore* (Sao Paulo: Pleide)
- [25] Zhao Y J, Wang A U, Xie P and Pan S 1983 Studies on medicinal function of the weaver ant *Guangxi Chinese Medicine* **6** 39-43
- [26] Wang Z J, Nan Z Y and Shen Y 1987 Studies on effect of the ant extracts on immune system and slowing down aging in little white mice *J. of Gerantology* **7** 41-4
- [27] Kemalok J and Maryati M 2018 Serangga dan mitos suku kaum Jakun, Kampung Peta, Mersing Johor *Serangga* **23** 1-11
- [28] Gullan P J and Cranston P S 2010 *The Insects-An Outline of Ethnoentomology* 4th ed (USA: Wiley-Blackwell)