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Traditional Processing Method of Smoked *Corbicula fluminea* (Etak): Case of Etak Vendor in Kelantan, Malaysia.

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Abstract. Traditional knowledge is very synonymous with communities and tribes around the world, especially indigenous peoples or in Malaysia known as Orang Asli. This knowledge is borne out of the constraints faced by society in daily life and often passed down from generation to generation. All aspects of life in the community such as traditional medicines, pest and disease control, farming method, tools used in the preparation of soil and roads, methods of food preparation and so on are assisted by the traditional knowledge created by the community itself. Asian clams (*Corbicula fluminea*), locally known as "etak" in Kelantan dialect, Malaysia, has been consumed by the local community as a snack for a years. Smoked "etak" is prepared traditionally using freshly harvested "etak" from the river or natural habitat. Freshly harvested "etak" is then washed thoroughly and soak overnight to remove sand and dirt. Followed by, marinating with the previously prepared spices and soak for about 2 hours. The last process is to smoke the "etak" on the fire with medium heat. "Etaks" are placed on a platform made of bamboo with height of about one meter above the ground. Beneath it was lighted with firewood and before "etak" can be placed on a bamboo platform, it was necessary to make sure that the firewood is burned to the coals. This is to ensure that the "etak" shell is not opened as it is considered to be damaged and should not be eaten as a snack. "Etak" with shell open will dry and lose its juiciness and flavor. "Etak" should be stirred all the time when it is on a platform with medium heat fire. "Etak" is usually smoked for about 45 minutes and left to cool down before eating or selling. Based on an interview and observation conducted, it can be concluded that smoked "etak" which is prepared using traditional method is preferred by consumers, as it has a unique aroma and flavor. Hence, the current study aims to document this knowledge through informal conversational interview with "etak" smokers and consumers in Kelantan as well as observing the working mechanism of this method.



1. Introduction

Traditional knowledge is very synonymous with communities and tribes around the world, especially indigenous peoples or in Malaysia known as Orang Asli. Every community and tribe around the world has its own languages, lifestyles, and cultures [1]. Each commune has its own traditional knowledge that are either inherited from their parents or gained through experience in their daily lives. This knowledge is borne out of the constraints encountered by society in everyday life. This knowledge is often passed down from generation to generation. All aspects of life in the community such as traditional medicines, pest and disease control, traditional farming method, tools used in the preparation of soil and planting land, methods of food preparation and so on are assisted by the traditional knowledge created by the community itself.

Malaysia is a federation consisting of 13 states and 3 federal territories. These are divided into two parts, which are the peninsula and Sabah and Sarawak. Peninsular Malaysia is consisting of 11 states and Kelantan is one of the state located at the east-coast of Peninsular Malaysia. Tumpat, Pasir Mas and Bachok is the district within 10 districts in Kelantan, located towards northern part and bordering with Thailand. Most of the people in this area are farmers who grow vegetables and fruit on a small scale. The farmers practiced both modern and traditional methods of agriculture. The modern methods include the usage of chemical fertilizers, insecticides, herbicides and also the use of plowing machines. Meanwhile, the traditional methods they use are in terms of preparation of crop planting bed with the use of hoe, the use of self-made silver shine plastic punching tools, the use of traditional tools or techniques for pest control such as bats, birds and squirrels with their own inventions. Even though their agriculture practices infuse traditional farming, the locals in this area highly depend on agricultural activities as a source of income for their living. Besides agricultural activities, “etak” processing or “etak” smokers and sellers are among the economic activities run by the community in these three districts.

Malaysia is a country with rich culture and ethnic diversity. Among them, traditional food and its preparation method are a major elements in Malaysian culture. One of the tiny clam which has been consumed by Kelantanese people is called *Corbicula fluminea* or “etak” in Kelantan dialect. “Etak” has been considered as traditional food heritage of Kelantan as it is only produced and consumed mainly at this part of Malaysia. “Etak” can be prepared in many ways but the special method is “salai” in Malay or smoked in English, is sold in the wet market or roadside stalls in Kelantan [1,2,3] as a snack [4]. Local people consume the smoked *C. fluminea* while gathering, watching television, and studying [5]. “Salai” or smoked is a special method invented and practiced by folks in Kelantan to cook “etak”. It is a traditional method where the process started with harvesting of fresh “etak” from the river or natural habitat. Then wash and soak overnight to remove sand and dirt in “etak” body. After that, marinate with the previously prepared spices and soak for about 2 hours. The last process is to smoke the “etak” on the fire with medium heat. “Etaks” are placed on a platform made of bamboo. The platform has a height of about one meter above the ground. Beneath it is lighted with firewood and before “etak” can be placed on a bamboo platform, it is necessary to make sure that the firewood is burned to the coals. This is to ensure that the “etak” shell is not opened because it is considered to be damaged and should not be eaten as a snack. “Etak” with shell open will dry and lose its juiciness and flavor. “Etak” should be stirred all the time when it is on a platform with medium heat fire. “Etak” was smoked for about 45 minutes and left to cool before eating or selling.

Smoked “etak” has become a popular snack among the people of Kelantan and the Malaysian community as a whole is believed to be due to the taste and nutritional value. “Etak” is rich in proteins, vitamins and other essential elements. According to [4], the composition percentage of omega-6 (n-6) polyunsaturated fatty acids (PUFA) is significantly greater than omega-3 (n-3). The n-6 / n-3 ratio of smoked *C. fluminea* is 2.95–3.11 and therefore can be considered as a healthy diet.

Corbicula fluminea (*C. fluminea*) or “etak” is one of the mollusc species, specifically bivalve which commonly named as Asian clam. This species can be found in Malaysia, Thailand, Cambodia, Vietnam, eastern Mediterranean, Africa and some place in eastern Australia [6]. In Malaysia *C. fluminea* are distributed in all the 13 states except Langkawi Island and Penang Island. While, in

Thailand, it is distributed in northern part namely Mekong River, Pa Sak River, and Lopburi River [7] and southern region at Saiburi and Pattani river [8,9]. *C. fluminea* is viewed as one of the world's most invasive freshwater clam, having invaded North America, South America, Europe and northern Africa [10]. It is used as fish bait and sold as “pygmy clam”, or “golden clam” in North America.

Several research has been carried out to identify the clam functions to ecosystems. According to [11], clam can be a best biomonitoring tool to assess heavy metal contamination as it has protein bond which can be linked with certain heavy metal that can harm its consumer. Similar to others clams, Asian clams is a filter feeder organisms that playing roles of filtering water that lead to protein binding and bioaccumulate to its soft tissues [12]. In Europe, clam has negative figure as invasive species that is easy to overpopulate and causing some unfavorable phenomena. However, at certain place in Malaysia this species population is scarce due to habitat changes and over harvesting phenomena [20]. Even this clam is one of traditional snacks for two states in Malaysia, the demand is high as they need to harvest the clam at others states in Malaysia. This situations leads to harvesting Asian clams is prohibited at certain river in Malaysia. Fisheries Department of Malaysia reported that over harvesting of may cause a negative effect on freshwater fish populations.

In Malaysia this species can be found in several places such as paddy field [13], brackish river and isolated river, thus there is not issues reported on overpopulation that leads to unfavorable phenomena as in Europe [14, 15]. In contrary, according to [16], the uncontrolled proliferation of Asian clams in Ireland may lead to other species population to decrease. This differences of outcomes explained by [14] which addressed the Asian clams as ecosystem engineer that has ability to create new ecosystem that may lead to positive and negative impact depending on the existing specific characteristics of the invaded ecosystem. For examples, Werner and Rothhaupt [17] reported that Asian clams can increase the epifaunal benthic invertebrates in poor structured sediment area as they helps in increasing the surface area and substrate diversity.

Hence the current study aims to document this knowledge through informal conversational interview with “etak” smokers and consumers in Kelantan as well as by observing the working mechanism of this method.

2. Methodology

2.1. Study Area

The study was conducted in Kampung Kok Keli (Tumpat), Kampung Kasar (Pasir Mas) and Kampung Gunung (Bachok), Kelantan, Malaysia (Figure 1). The study area was chosen based on availability of “etak” smokers. We have found out that there is one smoker in Kg. Kok Keli, while in Kg. Kasar there are two and Kg. Gunung has five smokers.

2.2. Study population and data collection.

The study used informal conversational interview and observations. Informal conversational interview was conducted among “etak” smokers in three districts namely Tumpat, Pasir Mas and Bachok with a total of 8 smokers. Observation was carried out to assess the function of this technique as well as to assess its effectiveness in smoking “etak”. There was no fixed duration or time period for data collections because the invention is already being implemented. Initial rapport-building visits included introducing the research activity and the research purposes as well as verbal discussions with the smokers. Informal conversational interview was conducted with the smokers to obtain the details of technique and smoking process. Observations were used to “collect live data from live situations”. Recording of observations was done using transcriptions and observation notes. Triangulation of data was achieved when both informal conversational interview and observations were used to source data. A summary of the data gathered was given to the respondent for them to listen to and comment as well as to validate them. Since the data were mostly collected in vernacular language, translation were done before analysis of the data was done in English. The data and study were qualitative in nature.

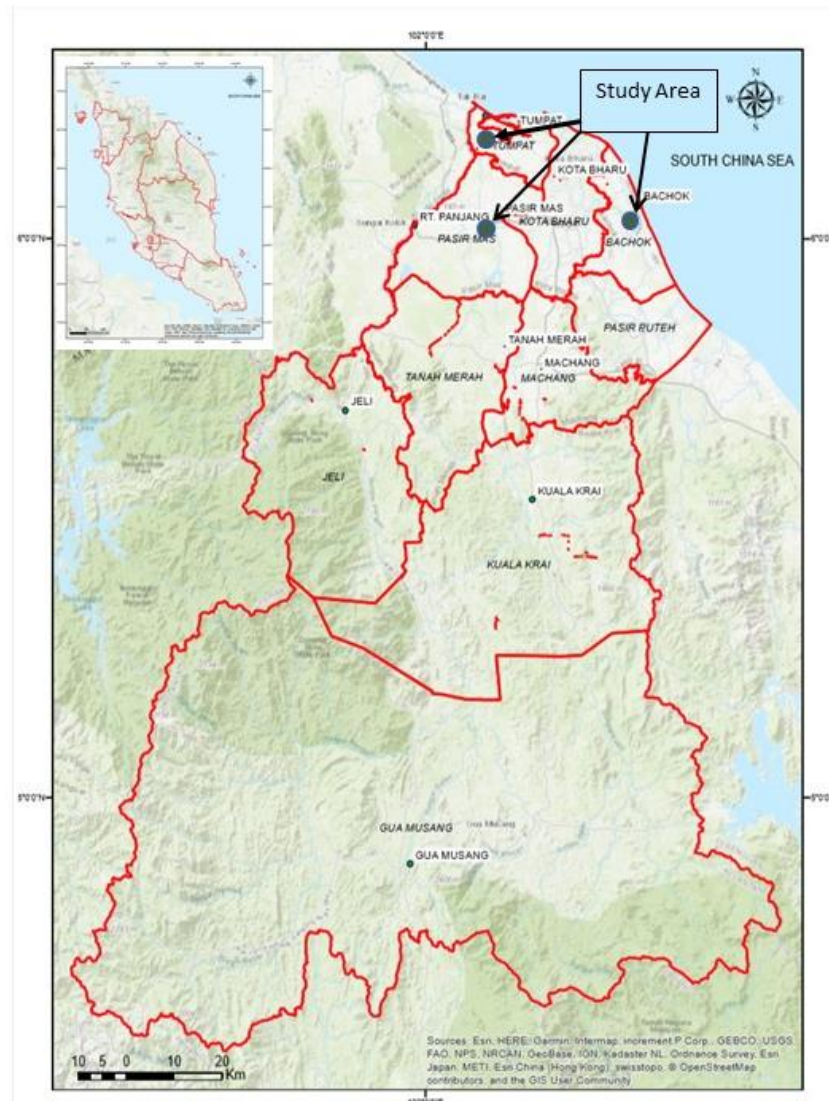


Figure 1. Peninsular Malaysia and enlarged map is of Kelantan. The arrow indicate the study area.

3. Results and Discussion

In the current study, we have conducted an informal conversational interview with “etak” smokers and consumers in three districts in Kelantan, Malaysia. As well as we studied the tradition method of smoked “etak” preparation. In general, there are several methods of preparing a shelled meal, however the most popular one is to smoke it with firewood. This is because the smoke from the burning of the firewood will create an aromatic scent and stick to the skin. The spice and its aroma that makes it smells good. The process of preparing “etak salai” or smoked “etak” is started by collecting “etak” from the original habitat from rivers or lakes or purchasing raw “etak” from raw “etak” distributors who supply them from Thailand. The original source of “etak” supplied by a local distributor said to be from Thailand is actually from Tonle Sap Lake from Cambodia that was brought through Thailand. For that reason, smokers from Kelantan on average say the “etak” is from Thailand. In the process, the raw “etak” will be washed with tap water several times to clean the impurities that are attached to the “etak” shell. After that the “etak” is soak overnight to remove sand and other impurities in the “etak” tissue. Next, he “etak” is mix with spices and marinate for about 2 hours with a finely ground spice.

This herb is made up of lemongrass, garlic, shallots, monosodium glutamate (MSG), fine salt, curry powder and red chilli. However, smokers from Kok Keli, Tumpat do not use curry powder in their ingredients. The last process is smoking. The “etak” that had been marinated with the spice were placed on a platform made of bamboo which was arranged apart to let heat get through to the “etak”. Before the “etak” is placed on the bamboo platform, the firewood is lit and allowed to ignite until its turn to charcoal with medium heat fire. The “etak” on the bamboo platform needs to be constantly stirred to ensure that the whole “etak” is getting the same heat. The most important rule in smoking “etak” is that the smoker must make sure the “etak” is cooked but the shell is not open. This is because when the shell is open, it is considered rejected product as it cannot be sold or eaten as a snack. This is because the opened shell smoked “etak” is to dried, not juicy and not tasty as closed smoked “etak”. Therefore, smoker skills are very important. The whole process of preparing smoked “etak” was shown in Figure 2.

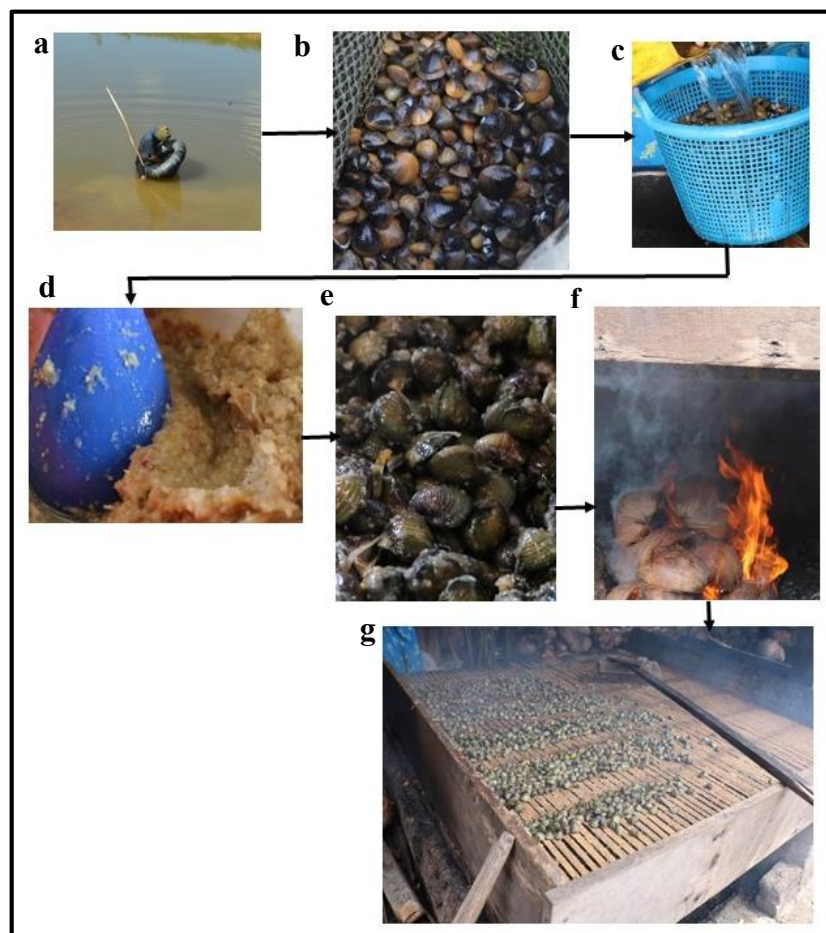


Figure 2. The preparation of “etak salai: (a) Beginning with the capture of “etak” from the habitat,(b) it is then washed with water until it is clean and soaked with water overnight to remove dirt. (c- e) The paste is prepared and mixed with pre-soaked “etak” and left for about 2 hours. (f and g) After that, the “etak” was placed on the bamboo platform and smoke for about 45 minutes.

However, this indigenous or traditional practice is subjected to trial and error, it has an adaptive and self-correcting mechanism because what used to be effective today might not be as effective as time goes by. Hence, the “etak” smokers will have to always plan and find an alternative approaches

to keep it effective at all time [21]. According to [18], the fresh and smoked “etak” compose high concentration of Mn (Magnesium) and it’s actually increase after smoking process that might cause by the smoking material used such as firewood ashes. Apart from heavy metals contamination, bacteria contamination also the biggest concern in a smoked “etak”. However, effort have been made by [19] who studied on eliminating some bacteria that can be found in smoked “etak” tissues by adding *Luucas zeylanica* in marinate paste of smoke “etak”.

4. Conclusions

The “etak” vendors from Tumpat, Pasir Mas and Bachok, Kelantan, Malaysia demonstrated a similar traditional way of cooking “etak” with different marinate ingredient which can preserve traditional taste and juiciness of the “etak”. Their knowledge on how to preserve taste and juiciness of clam which was eaten as it is while smoking is unique, rich and skillful. They know how to control heat while smoking so that, clam shell will not open because clam with shell open is considered spoiled and cannot be sold as “etak salai” or smoked “etak”. This knowledge helps them to control the quality and preserve “etak salai” as national heritage food. However, in future, loss of this traditional knowledge could lead to the loss of heritage food especially in the Kelantan State and country as a whole. Hence, documenting traditional knowledge is imperative and one of the way of helping to conserve traditional knowledge as well as to preserve “etak salai” as national heritage food.

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