

## Consumers' knowledge and perception towards *Melicope ptelefolia* (Daun Tenggek Burung): A preliminary qualitative study

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**Abstract:** *Melicope ptelefolia* (MP) is one of the alternative herbal resources which have a great potential to be marketed worldwide. Because of its exploratory nature, this study used qualitative research methodology, which is natural and highly interpretive in order to gain consumer insights. This preliminary qualitative study used an in-depth personal interview approach for data collection. Informants for this study were 30 regular consumers of MP, aged from 18 years old and above. From the findings, it is reported that MP had a slightly bitter taste, crunchy young leaves, pungent, and lemon-lime aroma. In terms of its physical characteristics, it is said that MP has trifoliate, green, thick, broad leaves and has small white and greenish flowers. Respondents have varying levels of awareness and knowledge regarding MP but most of them believed that medicinal products can be produced from this herb. Respondents also stressed the importance of scientific research to properly develop MP into medicinal products and turn it into alternative treatment that has commercial values in the market.

**Keywords:** *Melicope ptelefolia*, daun tenggek burung, herbs, herbal product, consumption pattern, purchase intention

### Introduction

The practice of using medicinal plants started a long time ago and has been prevalent among the local rural communities especially the Malays, aborigines and others. The utilization of these natural resources could be classified into three main races and four sources (Latiff, 1989; Salleh, 1998) namely Malay village medicine (including the aborigine's medicine), Indian medicine (from India), Chinese medicine (from China) and other traditional medicine (by Javanese, Arabs, Europeans, etc). Even though medicinal plants have been known throughout the world, public awareness among the younger generations are still limited. The rapid population growth along with the increase in level of education has improved the awareness of people towards the need for a better health.

*Melicope ptelefolia* (MP) is a shrub locally known as "tenggek burung, pauh-pauh, medang beberas, cabang tiga, tapak itik and Javanese people called it sampang while Siamese called it as Uam, Sam Ngam (Shoji *et al.*, 1989). MP grows wildly in open area, shrub edge, paddy field and turf areas of land and also grows well in peat and sulphate acid soil. Birds are main spreader of this plant. This plant is easy to

grow and do not need intensive care. In the city, this herb is sold at night market, farmer's market and small restaurants. Local vegetable market at Chow Kit Road, Kuala Lumpur is a place where retailers sold all types of local vegetables and herbs including MP. From the observation at this market, there is a high demand for this herb from the consumer. Many restaurants' owners bought the fresh local herbs from the retailers.

Most adults know more about the medicinal benefits of this herb compared to teenagers. Information should be provided to enable them to understand and being a knowledgeable consumer besides appreciating our local herb. Although our local herbs like *Tongkat Ali* and *Kacip Fatimah* are well-known in Malaysia, but many herb are still not widely known and need to be promoted aggressively.

### *Research and economic potential of medicinal plants in Malaysia*

Malaysia is endowed with a tropical rainforest which is rich in medicinal and aromatic plants which can be utilized as medicines, food, cosmetics by Malays, Indian, Chinese and aborigine's communities. There are about 1, 200 medicinal plants in Malaysia (Aman, 2006). Most of them are reported of having

potential pharmaceutical values and only a small number of these species have been utilized as active ingredients in cosmetics, fragrances and health care products. All of them showed an increase in the production of local plant-based products by the local industries.

Many of the aromatic plants are used as flavors in food or act as main ingredient in herbal therapy and cosmetics are grown in a garden or collected from the natural habitats. Recognizing the importance of medicinal medicines plants, efforts are now being taken by many agriculture sectors and entrepreneurs to cultivate medicinal plants for their products.

Many manufacturers of herbals, toiletries, cosmetics and aromatherapy products are constantly looking for new and appealing flavor and perfumery materials as ingredients in their products. The therapeutics properties of the medicinal plants are the value added to the products. The current trend worldwide indicates a preference for natural alternatives to synthetic products. Therefore, the use of aromatic and medicinal plants in personal care and nutraceuticals will continue to feature prominently in Malaysia lifestyle. Given the tremendous diversity of plants available in the Malaysian rainforest and the continuous demand for new fragrances, cosmetics ingredients and new therapeutic agents, the economical potential of aromatic and medicinal plants from the genus of *Melicope* is very promising.

With advancement in knowledge, expertise, research and development (R&D), growth of the herbal and biotechnology sector in Malaysia is expected to become as an alternative medicines and supplements to enhance human's health and practices in the future. Therefore, this study was conducted to identify information about consumers' knowledge and perception towards MP. Informative literatures and documentations are also useful in order to give exposure and knowledge to the public.

This study aims to evaluate consumer knowledge and perception towards MP, to find out the places and average price of this herb in the market, to analyze the benefits of MP and to evaluate the potential values of this herb from based on consumer's perspectives. So, the research questions in this study are:

1. What are some of Malaysian herbs and their benefits that consumers know the most?
2. How do the respondents describe the taste of MP?
3. How do the respondents describe the physical characteristics of MP?
4. Where are the places that consumers purchase or get access to MP?
5. What is the average selling price of MP in the

market?

6. What are the benefits of MP?

7. What are the potential values of MP?

#### Herbs

Herbs are defined as plant, plant part or extract used for flavor, fragrance or medicinal purposes (Clarkson, 1966). Herbs ranging from higher plants to lower plants of various habits have been said to have medicinal values.

#### Rutaceae Family

*Melicope ptelefolia* came from *Rutaceae* family. The *Rutaceae* family is a large family of trees, shrubs, woody climbers and a few herbs. Their twigs and branches sometimes armed with spines or thorns. They can be easily recognize from the aromatic or lime-like smell from the broken twigs, fruits or crushed leaves. Their leaves are trifoliolate which means there are three leaves at each stalk. Besides, the leaves usually dotted with oil-glands that appear as dark green spot or pimples under surface while as translucent spots when the leaf is held to the light (Jones, 1995).

This family comprises about 160 genera and 1650 species (Jones, 1995). It is mostly distributed in tropical and subtropical part of the world. There are about 23 genera with 75 species in Sabah and Sarawak areas. The natural habitats of the native species are at the lowland, hills, mountains and offshore islands. The majority of species are found below 1300 m elevation and a few ascend are at higher altitudes.

#### The genus of *Melicope*

In a recent taxonomic revision of genus *Tetradium* by Hartley (1981), many of the species previously placed in the genus of *Euodia* were transferred towards the name genus of *Melicope*. The differences of the two species were mainly defined on the basis of their seeds. The seeds of *Melicope* were shinier and remained attached to the dehisced follicle while the seeds of *Euodia* were usually dull and rough besides discharged from the follicle (Jones, 1995).

*Melicope* is a genus of small trees or aromatic shrubs or small to tall tree from the family of *Rutaceae* and it found in the tropical areas from Mascavene Island, Eastern and Southern Asia and also Eastwards into Polynesia. There are about 230 species, 13 or 14 of them occurred in Borneo (Hartley, 1994) and another 10 species are found at the mountain and lowland areas of Malaysia (Corner, 1952). Their leaves are either opposite or whorled, trifoliate, petioles wingless; leaflets are leathery or thinly so, with margin mostly entire and articulate at

the base. Besides, it comes with long stalks and the leaves are dotted with oil-glands and smell slightly resinous aromatic when crushed. It also has small flowers which are white and greenish white in color and has fragrant same as its small fruits.

#### *The benefits of Melicope ptelefolia*

According to Van *et al.* (1998), the leaves and twigs part of MP used for treatment of itches, wound infections, trauma, abscess, eczema, dermatitis and hemorrhoids whereas its root and bark parts are served as an appetizer, digestive and emmenagogue. Besides, they also reported other uses of this species as an antipyretic, anti-inflammatory and analgesic. The almost ripe fruit of this herb are used in Korean folk medicine as an analgesic, antiemetic, astringent and also as hypertensive agent (Yuk *et al.*, 1981). In Chinese medicine, dried and unripe fruit was recommended for the treatment of abdominal pain, diarrhea and also headache (Shoji *et al.*, 1989).

*Melicope ptelefolia* has also been reported to have antibacterial (Manadhar *et al.*, 1985) and fungicidal activities (Kumar *et al.*, 1990). Aman (2006) reported that this herb used as medicine to treat high blood pressure, reduces fatigue, improve blood circulation and relieve body stamina. It also acts as an aphrodisiac especially for men. Besides, this herb also contains a lot of antioxidants which is good for cancer.

#### *Knowledge*

Traditional knowledge is handed down orally from one generation to other through trial and error method Sinha (1996). What we know in surroundings is a matter of agreement and belief. Little of it is based on personal experience and discovery. Therefore, knowledge is categorized into realities-experiential and agreement reality. Experiential reality relates with things that we know as a function of four direct experiences. Furthermore, agreement reality deals with things that we consider real because we have been told that they are real and everyone else seems to agree they are real.

The study of tribal knowledge of plants is an imperative facet. People healed themselves with traditional herbal medicines and ancient remedies from time immemorial (Anbu, 2010). Moreover, most of such information is passed on to the following generations by traditional healers through oral communication and disciplined practice (Rastogi, 1982).

Knowledge about the beneficial values of herb is important for each consumer. Level of consumer knowledge also influences the decision-making process (Bagozzi and Dholakia, 1999). This study is

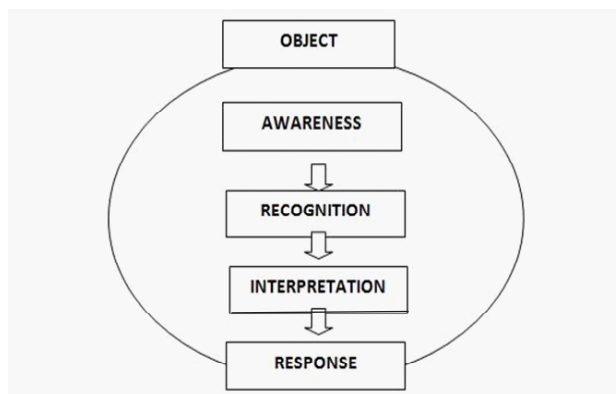
conducted in order to get deeper understanding about consumer knowledge and perception on this herb based on their consuming experiences.

#### *Perception*

Perception is the act of becoming aware of single or multiple stimuli together with their qualities based on the sensations that are caused the interpretation of those sensations (Shiffman and Kanuk, 2007). There are two levels of perception which are sensation level and cognitive level.

Moreover, perception is the meaning that a person attributes to the incoming stimuli that gathered through the five senses which are taste, smell, touch, hearing and sight. According to Kurtz and Boone (2006), people will have different perception of a certain object or events based on the interactions of two types of factors which are stimulus factors (color, shape, size and color) and individual factors (sensory processes, experience, motivation, expectation).

Perception defined as the process by which the individual receives and interprets the environment. They further stated that perception may be identified as a single process but it actually consists of several unique processes (Figure 1). A stimulus makes an individual aware of an objective. Next, the objective is recognized for what it is. The meaning of the object must then be interpreted and finally, interpretation triggers a response. Responses may include overt behavior, changes and attitude of both.



**Figure 1.** The Basic Conceptual Framework of Perception (Source: Moorhead, 1998)

#### *Factors influencing perception*

In attempting to explain and predict behavior, (Robins, 2003) suggested that reality is secondary to what is perceived. People's responses are based on their perception. A number of factors operate to shape and sometimes distort perception. Those factors can reside in the perceiver, in the object or target being perceived or in the context of the situation in which the perception is made. Robins (2003) summarized the factors influencing perception (Figure 2) and explained how perception affects attitude and

behavior (Figure 3).

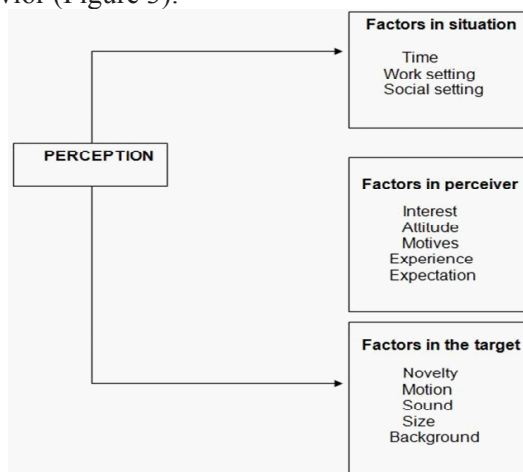


Figure 2. Factors Influencing Perception (Sources: Robins, 2003)

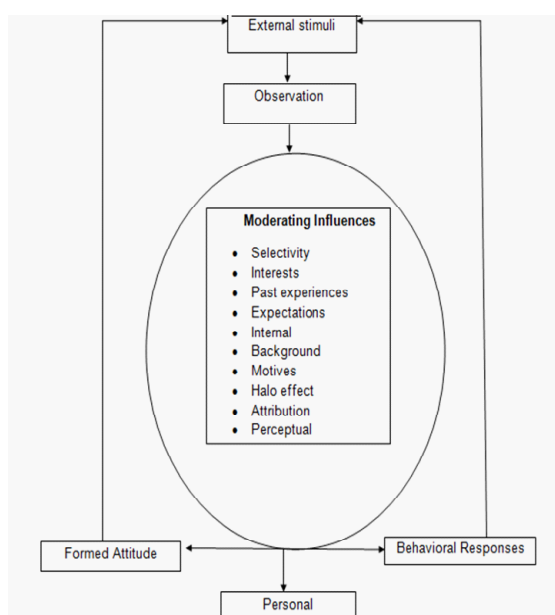


Figure 3. Factors influencing attitude (Robins, 2003)

## Methodology

### Research design

This is a preliminary qualitative research that aimed at analyzing consumers' knowledge and perception towards *Melicope ptelefolia*. Qualitative research is a natural and highly interpretive. An in-depth personal interview approach was used for the data collection.

### Participants and setting

This study was conducted from September to November 2009 in Selangor. Respondents came from different areas of Selangor such as Serdang, Kajang, Bangi, Putrajaya, Puchong, Klang, Sungai Buluh and Shah Alam. All of the respondents in this study were recruited based on the fulfillment of the characteristics of the potential respondents such as Malay, aged 18 years old and above and must be a regular consumer of MP (at least consumed MP within three months). It

is very important to get the right respondents in order to gather of rich information. A total of 30 respondents participated in the study which comprised of 18 men and 12 women. The age chose started from 18 years old because people at this age were assumed to make their own decision without depending on their parents besides in order to avoid sampling bias. All respondents volunteered to share their knowledge and perception towards this herb. Our main target population of this study was Malays because they are mostly familiar with this herb. Purposive sampling was used in this study.

### Procedure of study

This study was approved by the Medicinal Ethical Committee at the university. A consent form was provided before the interview session. An in-depth interview session was conducted at different days and time with all of the respondents. Explanation about the purposes of the study and the content of the interview were given to all respondents. All of the information in the interview session was tape recorded and assured that the data collected will be kept strictly confidential and anonymous. The interviews were recorded after the respondents agreed with all of the explanations provided. This study was conducted using open-ended questions in order to get free expressions, thought, own perspectives and natural feelings from the participants. Then, a memo about gestures and facial expressions of the respondents involved also were noted. The digital recordings of the interviews were transcribed verbatim into text for data analysis. Analysis was ongoing during the process of data collection and emerging data were examined according to an interactive process that served both to inform the interviewing and establish concepts for subsequent analysis. Besides, researcher also can detect the mistakes in the initial interview session and can improve it with the second respondents. After that, the data was read line-by-line in order to identify statements that are related to the research questions of this study. Those statements were marked and tentative codes were written in the margin for detection of emerging patterns. Similarities and differences were compared and codes that were similar in content were subsequently grouped and classified into various categories. The codes were repeatedly reviewed to ensure consistency of the coding. The first stage involved scanning all of the collected data to obtain a broad understanding of the data. The second step involved reading the interviews and listing categories of each questions. In a final step of data analysis, the coding work is manually undertaken.



### Interviews and data analysis

All the 30 respondents were recruited for the in-depth semi-structured interviews within 4 months period (September to December 2009). Duration of the interview session ranged between 30 and 60 minutes and aimed to identify the key themes and issues relating to how participants consumed and experienced this herb regularly and these lead to the development of an interview guide for the main phase of the data collection.

A pilot study was performed before conducting the real study. Several modifications were made based on the suggestions from the respondents. The interview guide consisted of 6 research questions. The introductory information about the demographic characteristics of the participants such as gender, age, and locations were identified. The first section acquires consumer knowledge on herbs as a general (e.g. Can you give several Malaysian herbs that you know the most and the benefits?) The second section focused on consumer knowledge and perception towards *Melicope ptelefolia* (How do you describe the taste and physical characteristics of MP? Where are the places that you purchase or get MP and What is the usual price per bunch?) Moreover, the final section focused on consumer knowledge opinion on the benefits of MP and its potential values). A set of question was designed to address the research questions of this study in order to obtain rich data from the participants.

## Results and Discussion

### Results analysis

The findings of the in-depth interview with 30 respondents were classified into 6 categories. The total 6 categories were extracted from the transcripts to provide in-dept consumer insights which answered all of the research questions.

**Table 1.** Respondents' demographic profiles

Demographics profiles	N	Percentage (%)
<b>Race</b>		
Malay	30	100.00
<b>Sex</b>		
• Male	18	60.00
• Female	12	40.00
<b>Age (years old)</b>		
• 22-33	9	30.00
• 34-44	8	26.67
• 45-55	10	33.33
• 56-66	3	10.00
<b>Locations</b>		
• Serdang	11	36.67
• Kajang	4	13.33
• Bangi	5	16.67
• Putrajaya	5	16.67
• Puchong	1	3.33
• Klang	1	3.33
• Sungai Buluh	1	3.33
• Shah Alam	2	6.67

Table 1 shows the demographic profiles of 30 regular consumer of MP that participated in this study. All of them were Malays. They were 18 males involved and the remainders were female. Basically, most of them were 18 years old and above. Finding showed that 10 of respondents aged between 44-55 years old, 9 respondents (22-33 years old), 8 respondents (34-44 years old) while 3 respondents were from the age group of 56-66 years old. Majority of the respondents in this study were from Serdang, Selangor.

### Name of several Malaysian herbs that participant mostly know and the benefits

**Table 2.** Name of several local herbs and benefits

Herbs	Benefits	N	%
<i>Melicope ptelefolia</i>	Serve as appetizer	30	100.00
<i>Pegaga</i>	Help people look younger Removes toxins in the body, good for blood circulation and maintain younger - Serves as an appetizer	7	23.33
<i>Tongkat Ali</i>	Energy and stimulant for men and contains antioxidants	7	23.33
<i>Kacip Fatimah</i>	Energy and stimulant for women	8	26.67

Table 2 shows the type Malaysian herbs that the respondents were familiar with. From the interview, all 30 respondents were familiar with MP, they said it is good as an appetizer. Of the 30 respondents, 8 of them said they know *Kacip Fatimah* and it is good for energy and stimulant for women whereas 7 people said that *Pegaga* and *Tongkat Ali* give benefits to the people. *Pegaga* is good for people to make them look younger, removes toxins in the body, good for blood circulation and also can serve as appetizer while *Tongkat Ali* acts as an energy stimulant for men and it rich in antioxidants.

### The taste of *Melicope ptelefolia*

Most of the respondents stated that MP is slightly bitter in taste young leaves are usually crunchy. Older leaves became slightly hard than young leaves. Mostly, younger leaves are preferred because of it crunchier characteristic. Moreover, it has a pungent taste and crisp-crunchy taste. It is also delicious and has the taste of cashews young leaves. It also has a good taste and has lemon-lime smell. People love to eat this leaves as *ulam* and goes well with *sambal belacan*, *tempoyak* or *sambal kelapa*. These findings are supported by the following quotes below:

“The taste is slightly bitter; it is crunchy for young leaves and slightly hard for the old leaves”  
(Female, 55 years old)

“*Melicope ptelefolia* has pungent taste, slightly bitter and crisp-crunchy taste”

(Female, 24 years old)

“It has pungent taste, crunchy and also delicious. Taking it like taking cashews young leaves”

(Male, 57 years old)

“It has a good taste, the leaves has lemon-lime smell, slightly bitter and crunchy for young leaves”

(Female, 64 years old)

#### *The physical characteristics of Melicope ptelefolia*

In this part, respondents explained about the physical characteristics of this herb. Basically, most of the respondents were able to describe the physical characteristics of this herb because they are familiar with this herb. MP has trifoliolate leaves which green in color, quite thick with width size of leaves. This herb comes from *Rutaceae* Family and has small flower; white and greenish white in color. These statements were supported by the quotes from respondents as below:

“The taste of these leaves is bit bitter, a bit bitter-fatty taste and a bit crunchy. About the shape of its leaf, it has trifoliolate leaves which consisted of three leaves in each small branch or we called it stalk. This herb also has small flowers which is white and greenish white in color”

(Female, 57 years old)

“It is tasty, lime-like smell, a bit bitter, MP has trifoliolate leaves and it comes from the family name called *Rutaceae*”

(Male, 26 years old)

“Quite thick, the leaves are wide, green in color. It has quite bitter taste, crunchy especially for young leaves”

(Female, 24 years old)

#### *Places and price per bunch of Melicope ptelefolia in the marketplace*

This section looks at the price per bunch of MP in the market. From the interview session, the average price of MP per bunch is between RM 0.50- RM 2.00 per bunch. Some of the respondents planted this herb at home and some of them buy it at farmer’s market and night market. Besides, some of them just took it from their village especially near paddy field and rubber estate areas.

“This herb usually sold at RM 1 per bunch at farmers and night market”

(Female, 23 years old)

“At the village, MP easily found near paddy fields, rubber estate and bushes areas. Yet here, I always buy it at farmers’ markets or night markets at a price range from RM 1- RM 2”

(Female, 64 years old)

“I planted the MP tree at home. Sometimes, there are food stalls and restaurants which served MP. The charge is between RM 0.50-RM 1.00. Besides, the price of this herb at farmer’s and night market ranges between RM 0.50- RM 2.00”

(Male, 35 years old)

#### *The benefits of Melicope ptelefolia*

In terms of the benefits of MP, we can conclude that there are several benefits that were mentioned by the respondents. Some of the benefits were, when added to water, the mixture of this herb can act as washer/cleanser to feminine part of women after giving birth. Respondents also mentioned that MP is an excellent appetizer. Most of the respondents said that MP is delicious to take as ulam/salad. Respondents also stated that MP can be used as a pain reliever, such as to control waist pain. It is also reported that from customers’ point of view, MP is rich in antioxidants, good for the skin and face and respondents believe that it can make used as an antiage or age-defying agent to make people look younger. MP also helps to control and reduce high blood pressure and diabetes mellitus if consumed regularly. Consumers also stated that MP is an energy booster, especially to improve men’s energy and can also help to prevent premature ejaculation during sexual intercourse.

“This herb gives benefit for women especially one who just delivers the baby. It can be used to wash the feminine part. It’s good for the recovery process of that part. It is also good if we serve it as an *ulam* and then eat together with “*sambal belacan*” or “*sambal tempoyak*”. It is also good for people who get waist pain” .

(Male, 37 years old)

“It is rich with antioxidant. Good for skin, face, and help people to look younger. It is also good for controlling chronic disease diabetes mellitus, high blood pressure and so on”.

(Male, 41 years old)

“It is good for reducing high blood pressure. We can see the effect fastly. Besides, it also gives good impact towards men’s energy. If we keep consuming this herb, this herb can help men to slow down the ejaculation of semen during sex. So, it can add enjoyment of sex between husband and wife”

(Male, 40 years old)

#### *The potential values of Melicope ptelefolia*

From the statements below, MP has high potential values. The consumption of this herb is good and acceptable by mostly Malays. Respondents believed that medicinal product can be a byproduct of this herb but scientific research must be carried out beforehand.

Hence if it proven scientifically that this herb could enhance the level of human health, the product could be profitable venture for entrepreneur. Moreover, herbal industry being grows rapidly nowadays and herbal manufacturers should take opportunities to develop new herbal product to enhance human's health.

“The consumption of this herb in Malaysia keeps increasing and many races can accept the usage of herbs in their daily life. Besides, if this herb proven to be health beneficial by scientific research, it will give a large return if it's being commercialize effectively”  
(Male, 52 years old)

“I know the benefits of this herb through experiences, but if this herb can be properly advertised and producing health product it's something good and I support it 100%”  
(Female, 44 years old)

“Some people know about this herb and its benefits. If it scientifically proven and could bring benefits to human health, I am sure it will be profitable”  
(Female, 25 years old).

## Recommendations

This study is limited to 30 respondents only. A more in-depth study that involved more regular consumers who consumed MP could be conducted in order to get deeper understanding and wider spectrum of this study. Besides, more research locations should be included in the sampling in order to gather perceptions and perspectives from other consumers who could represent different locations in Malaysia. Another way is to turn the qualitative findings from this research into questionnaire which will produce better generalizability empirical evidence with a larger coverage of respondents across Malaysia.

## Conclusion

In conclusion, this study provides a basic understanding on consumer's knowledge and perception towards of MP. Moreover, *Melicope ptelefolia* is a kind of herbs that has medicinal and culinary uses. In order to know the potential values of this herb, people must be aware and has knowledge on herbs and its values. This is because herb is a kind of natural product that can be easily bought from the farmer's and night market and the price is very reasonable. The herbs could become valuable and more demanded if a lot of people have knowledge about it.

The characteristics of MP were categorized into two main aspects which are the taste and the physical characteristics. In terms of taste, MP has a little bit bitter taste, slightly crunchy and has bitter-fatty after-taste. In terms of its physical characteristics, MP has trifoliolate leaves which is green in color, quite thick with wide leaves, has lime-like smell, comes from the Rutaceae family, and has small flower; white and greenish white in colour.

This study has revealed the opportunity to develop MP into a potential alternative herbal-based medicine. There are several benefits of MP ranging from cleanser to pain reliever and disease fighter. As food, MP can be served as an appetizer. There are several ways that MP can be developed into alternative treatment. For example, a douche for female cleanser, especially for women after giving birth and a pain reliever, such as controlling waist pain for older people. MP is also rich in antioxidants, which makes it an excellent anti-age or age-defying agent for the skin and face. MP also helps to control and reduce high blood pressure and diabetes mellitus if we consumed it on a regular basis. Besides, it can be taken as an energy booster, especially for men and can help in preventing premature ejaculation during sexual intercourse. As a conclusion, by using qualitative methodology, this study have gathered consumer insights, knowledge and perceptions which proved to show that in terms of market demand and market potentials, there is a huge opportunity for MP to be commercialized widely. However, there need to be proper scientific study to determine the true medicinal values and benefits of MP as claimed by the consumers.

## Significance of Study

This study was intended to find out about consumer knowledge and perception towards the consumption of MP. Most of the respondents were familiar with MP and all 30 respondents in this study were regular consumers. They knew the benefits and the values of MP. Thus, the herbal entrepreneurs should develop new herbal product from MP that can help to enhance people's health and this could be the best alternatives for traditional medicinal healers.

In terms of academic contributions, the findings of this study can be beneficial to other researchers who are interested in a similar area of study. It will give better insights into the applicability of MP especially in encouraging future research to be carried out on other herbs.

In the same way, the findings of this research will provide data to related government agencies

such as FAMA, MARDI, MIDA and FRIM to further formulate their policy related to herbs. The researchers from both government agencies and universities can also collaborate to further innovate and commercialized MP, thus maximizing its potential for the benefit of the people and nation.

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