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ENHANCING VITAMIN C CONTENT IN SOAP PRODUCTION VIA SUBSEQUENT AMOUNT OF EXTRACT FROM PHYLLANTHUS AMBLICA AND COSNICIUM BLUEMEANUM

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Abstract:

The demand for cosmetic products is rapidly growing, despite the majority of them is high in chemical substances and may harm the skin. Nowadays, there are other alternatives that may help to prevent the use of chemical substances in cosmetic products. For example, fruit contains its own nutrient. Furthermore, there are some fruits that contains high in vitamins and also good for the skin. Researchers noticed that Phyllanthus amblica (Melaka fruits) has an unpleasant odor but it higher with contains 30 times more vitamin C compared to orange while Cosnecium blumeaneum (mengkunyit) helps raise the level of vitamins C in the body. Therefore, looking at potential and benefits, research has been conducted to produce a bar soap (Amblica Soap) from Phyllanthus amblica and Cosnecium blumeaneum. Analyze has been done to determine the vitamin C, antioxidant level, and perception level of respondents towards Amblica Soap. Likert Scale and High-Performance Liquid Chromatography (HPLC) was used as the quantitative instrument. A number of 30 respondents were selected based on their locality. Descriptive analysis was used to analyses collected using SPSS version 25.0. Resulting confirming that is Amblica Soap not contain in vitamin C and shows the perception level of respondents towards Amblica Soap is highly positive. In conclusion, Amblica Soap accepted optimistically.

Keywords:

Phyllanthus Amblica, Cosnecium Blumeaneum, Vitamin C

Introduction

The cosmetic industry is dominated by a small number of multinational corporations that originated in the early 20th century, but the distribution and sale of cosmetic is spread among a wide range of different businesses. Even though the demand of cosmetic products is rapidly growing, despite majority of the cosmetic product is high in chemical substances and may harm the skin (Moyad, 2017).

Nowadays, there are other alternatives that may help to prevent the use of chemical substances in cosmetic products. For example fruits contain their own nutrient. Furthermore, there are some fruits that contains high in vitamins and also good for skin. The goodness of the fruits may help to get rid of the uses of chemical substances and may provide the good chance to spread the natural substances in cosmetic products. Thus, vitamin C is also good for skin. Based on research, Melaka fruit contains more than 30 times vitamin C compared to oranges. Therefore, Melaka fruit also can be innovated into soap (Moyad, 2017).

In Malaysia, the Melaka tree is planted for landscaping purposes. This happens because the locals did not know that *Phyllanthus amblica* (Melaka fruit) contains a lot of vitamin C and has benefits to health (Singh et.al, 2011). This fruit contains 720mg vitamin C in every 100g fresh Melaka fruit (Singh et.al, 2011) and has antioxidant value. Vitamin C content in fruits as Table 1.

Table I: Vitamin C Content in Fruits

Fruit	Vitamin C (mg/100g)
Melaka fruit	700
Guava	100
Kiwi	90
Lychee	70
Starberry	60
Papaya	60
Orange	50
Lemon	40
Mango	28
Honeydew	20
Grape	10
Apricot	10
Banana	9
Avocado	8
Apple	6
Pear	4

(Ehrlich, 2011 and Gloryfrench, 2006)

Looking for its potential and benefit, a research has been conducted to produce a bar soap named Amblica Soap from *Phyllanthus amblica* (Melaka fruit) and *Cosnecium blumeanem* (mengkunyit). Other than that, researcher want to determine the vitamin C content and also to know the level of acceptance toward Amblica Soap.

Literature Review

Phyllanthus Amblica (Melaka Fruit)

Aging problem is common with the increase in age. But the process of aging is totally changed. Skin starts to show sign of aging at an early age. These early signs of aging are due to unhealthy diet, pollution, stress and much more. Luckily, Melaka fruit helps to fight the problem of aging due to its high antioxidants content. Oxidative Radiance Activity Capacity (ORAC) value is 3387 micromole per 100 g. Free radicals are known to damage healthy cells. They damage the healthy skin and accelerate the process of aging. But antioxidants fight these free radicals and slow down the process of aging. (Moyad, 2017).

Malacca fruit is very rich in Vitamin C, and contains many minerals and vitamins like Calcium, Phosphorus, Iron, Carotene and Vitamin B Complex. Many health problems are caused by oxidative damage (when body cells use oxygen, they produce by-products called free radicals that can cause damage). Antioxidant agents prevent and repair these damages. Vitamin C is a good antioxidant agent, which makes gooseberries a powerful tool against a variety of conditions, including various types of cancer. (Harshanjit Singh,2002)

For many years the therapeutic potential of the fruits was attributed to their high ascorbic acid content, about 1g Vitamin C per 100ml of fresh juice (P. Scartezzini, 2006). Its fruit is reported to probably have the highest content of Vitamin C compared with any other naturally occurring substances in nature (Pornpimon MayaChiew, 2008).



Picture 1: Phyllanthus Amblica (Melaka Fruit)

Coscinium Blumeinum (Mengkunyit)

Coscinium blumeinum (mengkunyit) used as an effective sinus medication in Malay traditional medicine. This herb can relieve itching on the face, scalp and nose, frequent sneezing and a runny nose, acne on the face, itching in the toenails and hands. It also contains an antibiotic effect against some types of bacteria and fungi. The high content of flavonoids in the plant causes the function to act as anti-oxidants that can produce substances histamine and other allergies. Another advantage of this herb is to help raise levels of vitamin C in the body that protect against free radical damage and strengthens the joints. (datatanamanherba, 2011)



Picture 2: *Coscinium blumeum* (mengkunyit)

Coscinium blumeum (*mengkunyit*) is a wild plant that is commonly found in the forest, it is a climbing plant that can grow up to a height of ten feet (to climb on other plants or support) leaf width and length measures 7 x 20cm. There are two types of *Coscinium blumeum* (*mengkunyit*) that are *mengkunyit* gold and *mengkunyit* silver in contrast to the color of leaves. (datatanamanherba, 2011)

Glycerin

Glycerine is a humectant. It absorbs water from the air and thus attracts moisture to the skin. Glycerine is a natural by-product of the soap making process (chargrinvalleysoapandslave, 2017). Glycerine is an organic compound composed of carbon, oxygen and hydrogen (Axe, 2017). This thick, colourless and odourless liquid is used extensively in the beauty industry for making soap, antiaging gels and moisturizers. It was first discovered in 1779 by Swedish chemist, *Karl Wihelm Scheele*, who named it “sweet principle of fat” in 1811, *Michel Chevreul*’s, a Frenchman, named it glycerine, which comes from the Greek word *glyks* meaning sweet. Glycerine was mainly utilized for medical used and personal care until the late 1800’s (chargrinvalleysoapandsalve, 2017). As a humectant, this ingredient is often found as an ingredient in cosmetic products such as face washes, skin cream and lotion, soap and mouth washes.



Picture 3: *Glycerine*

Peppermint Oil Essence

Pleasantly suitable for an abundance of oral and topical uses and antimicrobial properties, peppermint may be the most versatile essential oil in the world along with lavender. Literally, there are few body, health and mind issues that it cannot help. Peppermint essential oil gives a cooling sensation and has a calming effect on the body, which can relieve sore muscles when used topically. It also has antimicrobial properties so it can help freshen bad breath and soothe

digestive issues. Clinically speaking, peppermint oil is recommended for its anti-nausea benefits and soothing effects on the gastric lining and colon because of its ability to reduce muscle spasms. Not only is peppermint one of the oldest European herbs used for medical purposes, other historical accounts date its used to ancient Chinese and Japanese folk medicine. Peppermint oil benefit soothe digestive issues, relieves headache, improve mental focus, boosts energy, releases tight muscle, sinus care, allergy relief, skin health, acne treatment and sunburn relief.(Axe,2017)



Picture 4: Peppermint Oil Essence

Research Methodology

Producing Amblica Soap

There are four main ingredients required in the production of Amblica Soap. They are extraction of Melaka fruit and also mengkunyit, glycerin, and *peppermint essential oil*. These then put it into a soap mold with room temperature to harden and become a soap bar. The process flow of producing the Amblica Soap is illustrated as in Figure 1.

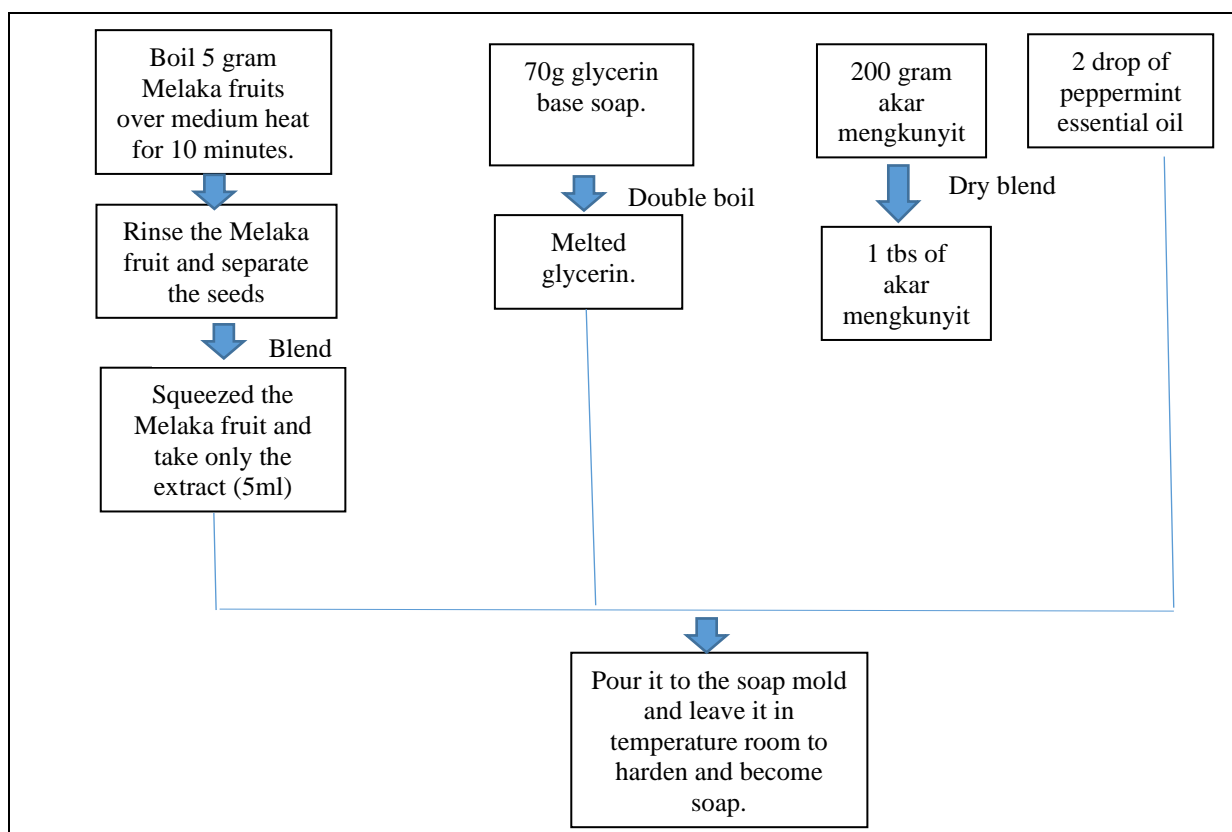


Figure 1: Process of Making Amblica Soap

Research Design

Researchers has used quantitative research design. A set of questionnaire using Likert Scale was used to determine the acceptance level of respondents towards Amblica Soap as in Figure 2.

Item Evaluated	Very Dislike (1)	Dislike (2)	Not sure (3)	Like (4)	Really Like (5)
I like the colour of soap					
I like the texture of this soap					
I like the smell of this soap					
The soap is not slimy					
This soap makes my skin softer					

Figure 2: Questionnaire to Determine Respondent Acceptance Level towards Amblica Soap

Research was done to determine respondent acceptance level towards Amblica Soap which are its colour, texture, smell, in term of the soap is not slimy and skin smoothness, moistness, fairness after application.

Research Respondent

Respondent from ages from 18 to 50 years old were selected. This is because aging problem is common with the increase in age. Skin starts to show sign of aging at an early age. These early signs of aging are due to unhealthy diet, pollution, stress and much more (Harshanjitsingh, 2002). 30 respondents were given Amblica Soap sample. They applied the sample onto the skin prior answering the questionnaires.

Vitamin C Analysis

The High Performance Liquid Chromatography (HPLC) at the Department of Chemistry Malaysia, Ministry of Science, Technology and Innovation was used to determine the amount of Vitamin C, while pH value was determined using the pH meter.

Data Analysis Method

Data collected from the questionnaires were analysed using Statistical Package for Social Science (SPSS) version 25.0 and interpreted using mean score. The mean value range interpretation are in Table 2.

Table 2: Interpretations of the Range Of Value Mean

Score Mean	Interpretation	Level
1.00 to 2.33	Low	Weak
2.34 to 3.66	Middle	Middle
3.67 to 5.00	High	Good

(Mohd Najib Abd Ghafar, 2003)

Data Analysis

Producing a Soap Bar by Using Extract from Melaka Fruit and Mengkunyit

Analysis showed that the respondents highly accepted the Amblica Soap after application with mean value 4.00. Table 3 indicates the mean score for attribute evaluated.

Table 3: Interpretations of Mean Score of Amblica Soap

Item Evaluated	Score Mean	Interpretation	Level
Acceptance	4.00	High	Good

To Determined Vitamin C Content in Amblica Soap

Result indicated that the pH value is 9.5. It is also confirmed that vitamin C is not detected in Amblica Soap with amount of ND <0.1 as indicated in Table 4.

Table 4: Interpretations of Vitamin C Content in Amblica Soap

Test Parameter	Test Method	Unit	Result
pH	pH meter	-	9.5
Vitamin C	HPLC	mg/100g	ND<0.1

(Malacca Institute of Biotechnology, 2012)

To Determine the Perception Level of Acceptance towards Amblica Soap

Respondents moderately agree that the color of Amblica Soap with mean value 3.47, the pleasurable texture and refreshing smell is strongly accepted with mean value 3.80 and 4.37 respectively. They also strongly agree that Amblica Soap possess good slimmy giving mean score 3.67, and also Amblica Soap giving them soft skin with mean value 4.10. Table 4 indicates the mean score for each attribute evaluated.

Table 5: Interpretations of perception Level of Amblica Soap

Item Evaluated	Score Mean	Interpretation	Level
Color	3.47	Middle	Middle
Texture	3.80	High	Good
Smell	4.37	High	Good
Slimy	3.67	High	Good
Soft skin	4.10	High	Good

Results and Discussion

Overall, respondent's acceptance of this product is high. Nutritional analysis showed that the Amblica Soap is not contains in vitamin C. The majority of people who consumed Amblica Soap like the soap very much and smells fragrant and fresh.

Each of which types of fruit has its own privileges, as well as the fruit of Malacca. The results of the study, many who still do not know what the Melaka fruit, efficacy and benefits.

Malacca fruit is very rich in vitamin C, and contains many minerals and vitamins like Calcium, Phosphorus, Iron, Carotene and Vitamin B Complex. Many health problems are caused by oxidative damage (when body cells use oxygen, they produce by-products called free radicals

that can cause damage). Antioxidant agents prevent and repair these damages. Vitamin C is a good antioxidant agent, which makes gooseberries a powerful tool against a variety of conditions, including various types of cancer. (Harshanjit singh, 2002). It is also stated that by The Melaka Fruit is rich in Vitamin C (Lim T.K, 2012)

Mengkunyit also have properties to help problem sinus and have high nutrition. *Coscinium Blumeianum* (Mengkunyit) used as an effective sinus medication in Malay traditional medicine. This herb can relieve itching on the face, scalp and nose, frequent sneezing and a runny nose, acne on the face, itching in the toenails and hands. It also contains an antibiotic effect against some types of bacteria and fungi. The high content of flavonoids in the plant causes the function to act as anti-oxidants that can produce substances histamin and other allergies. Another advantage of this herb is to help raise levels of vitamin C in the body that protect against free radical damage and strengthens the joints. (datatanamanherba, 2011)

In this research also, it is proven that the Amblica Soap is not contain in vitamin C reported by Melaka Biotechnology Corporation and the acceptance level for Amblica Soap is 4.00 which is high and in a good level of acceptance of Amblica Soap.

Recommendation

For recommendation, researcher suggested that the Amblica fruit and mengkunyit is added after the Glycerin base soap cool down. It is for enhance the more vitamin C in the Amblica Soap.

Summary

In conclusion, the results of the discussions can be concluded that the Amblica Soap is highly accepted.

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