ANTIOXIDANT PROPERTIES OF LIP BALM DERIVED FROM THE PEEL OF RED DRAGON FRUITS (HYLOCEREUS POLYRHIZUS)

Norshila Md Isa[1], Nur Haniza Ewandi Jong[2], Hamidah Noor Md Yusoh[3]

[1,2,3]Department of Tourism and Hospitality, Politeknik Merlimau, Malaysia
[1]mysaila2905@gmail.com
[2]hanyss89@gmail.com
[3]mckin81@gmail.com

Abstract: Recently, the need for herbal merchandise is increasing especially within side the cosmetics industry. Lip balm is one of the extensively used beauty merchandise that functioned as a shade of protection to the lip and may contain subdue numerous poisonous results of lead and technology of oxidative pressure. Red Dragon Fruit (Hylocereus polyrhizus) contains an effective antioxidant amaranth colorant referred to as betacyanin pigment. Looking at this benefit, this research aims to analyze the antioxidant activities of betacyanin pigment in lip balm from the peel of Red Dragon Fruits. The finding indicated antioxidant properties contained in lip balm from the peel of Red Dragon fruit result changed into 2.0% using in house method based on International Food Research Journal. In conclusion, the application of natural color derived from the peel of Red Dragon fruit is safe and can act as a natural dye that has antioxidant properties which do not affect the color and texture of the lip balm.

Keywords*: antioxidant properties, lip balm, Red Dragon fruit*

1. Introduction

Currently, cosmetics product grows to be intensively used by guys and ladies to enhance their appearance and beautify themselves. Many new beauty merchandises is produced and advanced each day as compared to the previous. Besides, people are aware of environmental consequences related to the use of abundant chemicals in everyday products (Hapiz et al., 2021) and turning withinside the path of green to adopt a more natural way of life (Kadu et al., 2014). Moreover, customers are attempting to find herbal-primarily totally based cosmetics to keep away from allergic reactions, any facet results, and for the protection of their health. Since the lip has no oil glands, in order that they need greater moisture and safety at some point of the day (Christopulos A, 2011). Lip balm is one of the beauty products that soothe dryness and chapping and assist sore lips to experience better. Lip balm is a kind of cream or an ointment this is used to preserve the lip's smooth which is available in a stick or small tub. A good lip balm must have persuading traits and be multifunctional in a way to is appropriate to consumers, inclusive of having an appropriate texture and antioxidant properties. Antioxidants are compounds that can stop, or delay cell deterioration brought on by free radicals, unstable molecules that the body creates in response to its environment. (Ware, 2018).

Hylocereus polyrhizus, a member of the Cactaceae family, is becoming more and more popular in nations with climates suitable for cultivating various kinds of tropical and subtropical fruits in general. Due to the commercial interest in it, it is now grown all over the world, especially in countries of Asia including Malaysia, Vietnam, and the Philippines. (Kamairudin et al., 2014) and over 20 tropical and subtropical countries (Mercado-Silva, 2018). It was first cultivated in Johor, Perak, Negeri Sembilan, Pahang, Pulau Pinang, and Sabah in the 1990s after being introduced to Malaysian agriculture. (Department of Agriculture Sarawak, 2013). The red dragon fruit is distinguished by its brilliant pink skin and green scales. The reddish-violet meat is encrusted with numerous tiny black seeds that are high in vital fatty acids. (Ariffin et al., 2009). A ripe dragon fruit includes a significant amount of total soluble solids, which are rich in organic acids, according to prior study. (Stintzing et al., 2003), protein (Le Bellec et al., 2006). Vaillant et al., (2015) reported that the presence of other phenolic components enhanced the high antiradical properties of dragon fruit. Furthermore, Cai et al., (2003) demonstrate that different betacyanins and betaxanthins have structure-activity relationships that show free radical scavenging properties, which helps to increase interest in Hylocereus polyryhizus as an antioxidant source.

Recently, there has been research about many natural dyes as a colorant. This Red Dragorn fruit (Hylocereus polyrhizus) is recognised to have various benefits for health, including as strong antioxidant content and antibacterial characteristics (Anjarsari et al., 2020). Abhijeet (2012) stated that super red dragon fruit could be added to food, medication, and cosmetic products. There are not many people that use this fruit for lipstick, though. Due to the presence of antioxidant qualities, which neutralize the free radicals produced in lips due to the free radicals produced on lips because of external influences and prevent aging on the lip, the start of the unsightly wrinkled chapped lip can be reduced. (Kamairudin et al., 2014). The main objective of this research work is to determine the antioxidant properties of the production of lip balm made from the peel of red dragon fruit (*Hylocereus polyrhizus*) that act as a natural dye in natural lip balm formulation.

2. Materials and Methods

2.1 Plant material

Red dragon fruit peel (Hylocereus polyrhizus), which was purchased from the neighbourhood market area in Merlimau, Malacca, Malaysia, served as the study's primary source of the material. The red dragon fruit peel was extracted by using the slow extraction method.

2.2 Formulation of lip balm

To remove impurities like dirt, grit, and dust, red dragon fruits were thoroughly washed in water. To maximize the surface area and the extraction effectiveness, the dragon fruits were first peeled, followed by the weighting and chopping of around 200 g of the skins. These small pieces of peels of dragon fruits were boiled with water (150ml) at a temperature of 70^{o}C for 10 minutes. Figure 1 illustrates how lip balm was made by combining honey, corn starch, and petroleum jelly with red dragon fruit peel extract. The mixture is then double-boiled to melt all the ingredients until mixed thoroughly. After melting completely, a mixture was poured into a

container and it was let to dry at room temperature as shown in figure 2. Next, it was put into the refrigerator for solidifying for further evaluation. The materials were weighed using an analytical balance. The formulation of lip balm is given in Table 1.

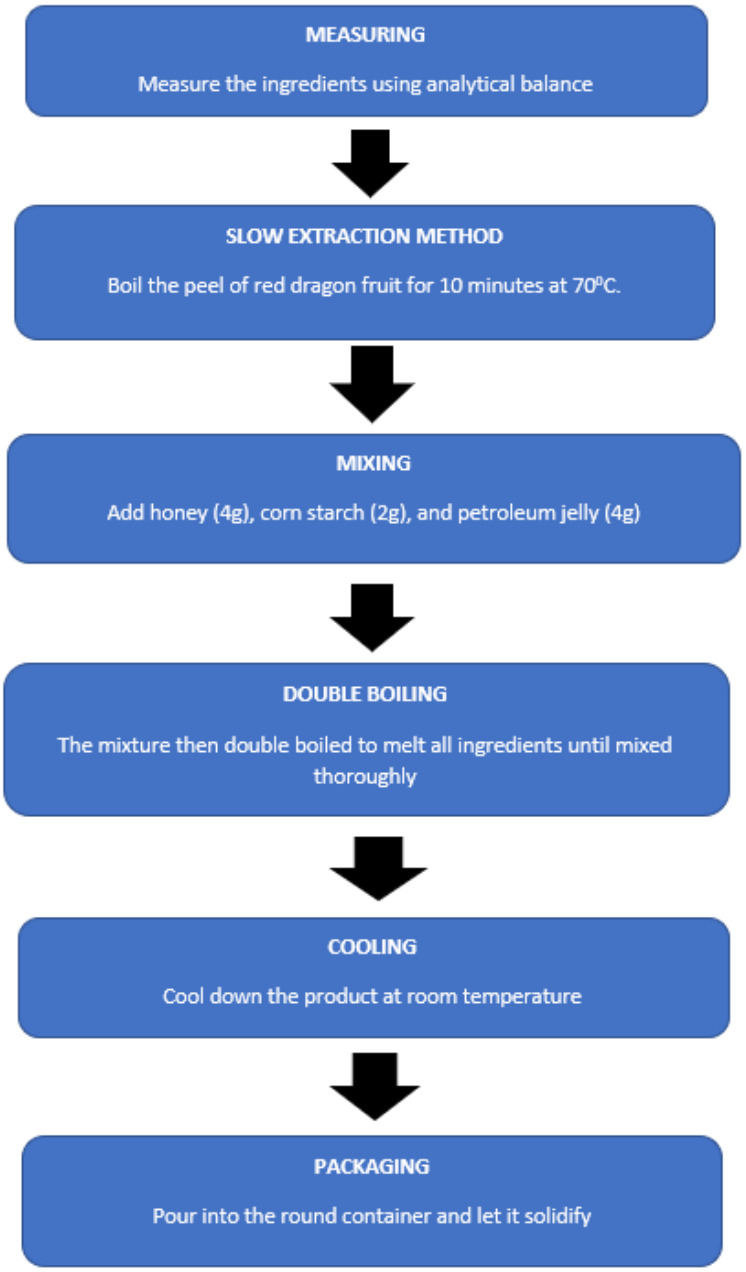

Figure 1: Process flowchart

Figure 2: Lip balm

Table 1: Formulation of lip balm

Ingredients	Quantity (gram)
Peel of red dragon fruit extract	95
Honey	4
corn starch	2
Petroleum jelly	4
Total (g)	105

2.3 Evaluation of lip balm

Antioxidant properties were determined through an in-house method based on International Food Research Journal. This analysis was carried out by a chemist at the Melaka Institute of Biotechnology. In addition, a test for lip sensitivity involved applying lip balm for 30 minutes to the lips.

3. Results

Antioxidant properties of the lip balm that was made from the peel of red dragon fruit (Hylocereus polyrhizus) were determined through an in-house method based on International Food Research Journal. This method refers to the determination of antioxidant activity in foods and beverages by reaction with 2,2’ – diphenyl-1-picrylhydrazyl (DPPH): collaborative study first action 2012.04 (Plank et al., 2012). As stated in table 2, the results showed that lip balm contains 2.0% antioxidant activity.

Table 2: Result of antioxidant activity

Test Parameter	Unit	Test Method	Result	Limit
Antioxidant activity (DPPH Radical Scavenging Activity)	%	In-house method based on International Food Research Journal	2.0	N/A

4. Discussion

Antioxidant activities are frequently assessed using the DPPH radical scavenging activity assay, which examines a sample's capacity to donate hydrogen (H) to DPPH radicals. (Choo and Yong, 2011). According to Norashikin and M.Azlan (2016), Plant antioxidants called flavonoids and polyphenols, which are polar and easily soluble in water can quench DPPH free radicals. Besides, the amaranth pigment betacyanin, a potent antioxidant, is present in red dragon fruit. It can stop the oxidative damage brought on by low lead levels (Lwin et al., 2020). In this study, betacyanin colorant from the red dragon fruit peel was extracted by slow extraction method, and the sample's results revealed that there was 2.0% of antioxidant activity per 100g sample. Previous studies stated that the effective concentration (EC50) for red dragon fruit was 2.9±0.4 mM vitamin C (Rebecca et al., 2010). And lip balms do not cause skin irritation or itchiness when left on for 30 minutes. This is because all ingredients that are used in making the lip balm are safe. Honey is the second main ingredient in this lip balm formulation. Kishore et al (2011) stated that the antioxidant property of honey is increased by the phenolic compound and has several preventive qualities against a wide range of medical illnesses, including cancer, inflammatory disorders, coronary artery diseases, neurological deterioration, and aging. Petroleum jelly gave a favorable texture and works nicely to keep skin moist. Furthermore, it also preserves the lip’s smoothness. The color of the lip balm gave a bright red-purple. To impart elegance to lips as well as to enhance the aesthetic appeal of the cosmetic formulation selection of coloring agents is of utmost importance (Pawar et al., 2021). Because the marketing of cosmetic items heavily relies on color. The current research work aims to prepare lip balms containing antioxidant properties. As we can see, the use of antioxidants in cosmetics can benefit both the lips and formulations by preventing the consequences of oxidative damage.

5. Conclusion

In conclusion, the combination of ingredients such as honey, petroleum jelly, and corn starch produce a great consistency of product. This lip balm has no skin irritation, and the formulation would increase customer acceptance since the additional properties of antioxidants added extra market value to the product as a cosmetic product. It is because consumers involved with the surroundings are inclined to spend extra on "environmentally friendly" products, favoring the increase of the marketplace for natural cosmetics.

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