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Formulation and Evaluation of Herbal Lip Balm by Using Walnut Oil

Akshata Y. Kale*, Namrata S. Ghorpade, Sanskruti S. Nalawade, Sayali R. Zanje, Prachi Vedpathak.
YSPM's, YTC, Faculty of Pharmacy, Satara

ABSTRACT

Cosmetics are the external preparations, which are applied to the skin, hair, nails for various purposes like protecting, covering, colouring, beautifying, cleansing and nourishing. Lip Balm is one of the beauty products that soothe dryness and chapping and assist sore lips to experience better. Antioxidants can be used to protect the skin from damage caused by oxidation to prevent premature aging. Walnut Oil is an effective antioxidant and anti-inflammatory properties which are help to protect from several harmful effects to the lips. Red Dragon Fruit (Hylocereus polyrhizus) contains an effective amaranth colorant referred to as betacyanin pigment. The application of natural colour derived from the Red Dragon fruit is safe and can act as a natural dye that has anti-inflammatory and antiulcer properties which do not affect the colour and texture of the lip balm. The dragon fruit herbal lip balm is a natural, effective, and sustainable alternative to traditional lip balms. Its unique blend of ingredients provides excellent moisturization, protection, and antioxidant benefits, making it an attractive option for consumers seeking a healthy and natural lip care solution. The aim of the research was to formulate and evaluate herbal lip balm incorporated with walnut oil and red dragon fruit.

Keywords: Walnut Oil, Antioxidant, Anti-inflammatory, Red Dragon Fruit, Herbal Lip balm.

*Corresponding Author Email: manjaribobade@gmail.com
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INTRODUCTION

The cosmetics are the word derived from Greek word – 'kosmesticos' which means to adorn. From that time the materials which are used to promoting appearances or to beautify the skin is called as cosmetics. Cosmetics are the external preparations, which are applied to the skin, hair, nails for various purposes like protecting, covering, colouring, beautifying, cleansing and nourishing. Now a days cosmetics are one of the essential commodities of life. Cosmetics are mainly used for two purposes, i.e. enhancing personal appeal of human being and care of body parts. It is crucial to take good care of the lips because they are one of the most delicate and beautiful organs in the human face.[1] Lip balm is a cosmetic product similar to lip stick. They are used to prevent lip dryness and protect against hazardous environmental factors. This work involved the production of a lip balm by formulated with natural or herbal raw materials. Lip balm is a cosmetic product that both men and women use to keep their lips healthy. It is used to preserve the shape and appearance of the lips and guard against sores and cold sores on the affected lips. The important of the key components are butters, oils, and waxes, must be balanced for creating the lip balms. [2]

Walnuts (Juglans regia L.) are widely cultivated and important oilseed crops in China.[3] Walnut oil is a nutrient-rich source, containing essential unsaturated fatty acids like linoleic acid; linolenic acid, and oleic acid. They are widely sourced and distributed, featuring high oil content in their kernels with oil yields ranging from 52% to 70%. Nonetheless, due to the high content of unsaturated fatty acids in walnut oil, it is susceptible to oxidation when exposed to the environment for an extended period, raising significant concerns about its quality. Oxidation of fats and oils poses considerable health risks, leading to the formation of hydroperoxides. Over time, these oils undergo further oxidation, resulting in secondary decomposition products like aldehydes, ketones, acids, and alcohols. These byproducts not only alter the oil's taste but also have a detrimental impact on its nutritional value and product quality. Oil oxidation primarily falls into three categories: enzymatic oxidation, auto-oxidation, and photo-oxidation. Enzymatic oxidation, among these, necessitates specific conditions for its occurrence and can be mitigated. Auto-oxidation can be delayed by incorporating antioxidants. Managing the impact of photo-oxidation, particularly from ultraviolet radiation, on grease oxidation proves challenging. The mechanism underlying photo-oxidation involves the conversion of ground state oxygen to excited oxygen by the light-sensitive substance (chlorophyll) in the oil upon ultraviolet light absorption. Excited oxygen then proceeds to attack the double bonds in the unsaturated fatty

acids present in the oil, leading to the shifting of these double bonds and ultimately culminating in the formation of hydroperoxides [4].

In recent years, the research on walnut oil has become popular because walnut oil is a kind of edible oil with high nutritional value. It has good antioxidant properties.[5] The antioxidant capacity of walnut oil is closely related to its processing technology. It is known that oxidation reaction could produce free radicals. Which can start chain reaction that will damage skin cells. Increasing the number of free radicals could initiate the wrinkling, photo aging, drying of the skin.[2] It is well known that plants can produce natural antioxidant compounds that could control the oxidative stress caused by sunlight and oxygen. Therefore, the reports related to walnut oil processing have attracted extensive attention. Despite containing inherent antioxidants like polyphenols, vitamin E, and sterols, walnut oil still faces a significant challenge in preventing oxidation. Natural antioxidants offer the benefits of safety, low toxicity, and harmlessness. The Walnut oil has also anti-inflammatory properties and also have good antiaging activity.[5]

Pitaya, also known as Dragon fruit (Hylocereus polyrhizus), is a tropical fruit that belongs to the Cactacea tribe and has been widely developed in Indonesia. The shape of the fruit is unique and attractive; the skin has red and green scales similar to the scales of a dragon, and the taste is sweet, sour, and fresh. Red dragon fruit has thick skin, although it has quite a lot of flesh, which is 30-35% of the dragon fruit's whole weight (Utami et al., 2020). In addition, red dragon fruit skin also has considerable potential it contains of phenolic compounds, flavonoids, carotenoids, and anthocyanins. Methanol extract, the ethyl acetate soluble fraction, and the ethyl acetate insoluble fraction of red dragon. Red dragon fruit also contains pectin compounds and other compounds such as galacturonic acid, manossa, galactose, xylose, and ramnose. Various types of skin care cosmetic preparations have been circulating in the market in attractive dosage.[6] Anti-inflammatory or anti-aging are preparations that function to inhibit the process of damage to the skin (degenerative), and to inhibit the appearance of signs of aging on the skin. The health-promoting potential of pitaya fruit is due to the presence of bioactive compounds related to numerous benefits such as anti-diabetic, anti-inflammatory, antioxidant, anti-cancer, and antimicrobial. As a result of these beneficial actions, the consumption of this fruit has in increased in different regions worldwide. Dragon fruit consists of multiple biologically active phytochemicals including the antioxidant vitamin C, beta-carotene, lycopene and betalain.100 g dragon fruit contains about 120-200 mg of potassium,30-45 mg of magnesium, 20-45 mg of Calcium, 20-35 mg of phosphorus, 0.70-1.5 mg of Iron, and 0.20-0.40 mg of Zinc. There are

three species of dragon fruit available in the Market; Red, Yellow and White (H. polyrhizus, H. megalanthus, H. undatus). The Red Dragon Fruit juice is excellent colouring agent. It is biochemically non-toxic.[7]

MATERIALS AND METHOD

Ingredients to be used for lip balm preparation:

The Wanut oil used in the formulation were purchased from the Wagdole Ayurvedic Store 501 Pathi, Satara. The Red Dragon fruit were purchased from the Fruit Market Mumbai. Other ingredients used in the present study used were from laboratory of analytical grade.

Beeswax:

Beeswax is a food grade wax with a white colour when it is freshly prepared. The important quality of beeswax is its hardness and glossiness. [1]

Red Dragon Fruit:

The red dragon fruit plant is a big climbing cactus that bears red fruit and tall, succulent-like branches. These fruits are sweet, juicy and dense; they can be eaten raw, chopped, or blended into smoothies or ice cream. It is an Excellent colouring agent with Anti-inflammatory properties. This fruit prevent aging. Wrinkled, chapped lips can be reduced.[1]

Walnut Oil:

Walnuts (Juglans regia L.) are widely cultivated and important oilseed crops. Walnut oil is a kind of edible oil with high nutritional value. Walnut oil is a nutrient-rich source, containing essential unsaturated fatty acid. It has good Antioxidant and anti-inflammatory properties.[5]

Almond Oil:

The Almond oil is obtained from the kernels of sweet almonds. It is help to hydrate and soften the skin.[8]

Rose Oil:

It is good flavouring agent and moisturizes your lips and makes them pink and plump.[8]

Vitamin E:

Vitamin E is a fat-soluble antioxidant with anti-inflammatory properties and it is help to maintain the stability of product.[8]

Method of Preparation of Lip Balm:

Weigh all the ingredients. In a beaker melt the Beeswax in a water bath at 50°C to 60°C. Adding 2-3 drops of Dragon fruit juice extract in the beaker with continuous stirring. Then adding other ingredients such as active ingredient walnut oil and vitamin E in the beaker. Rose oil as a flavouring agent is added. Before pouring the mixture into the Lipstick mould add glycerine to

the mould by using cotton swab. The prepared Lip Balm was put in the freeze to cooling purpose for 10 minutes. A total three formulations as F1, F2 and F3 were prepared using the change in concentration of active ingredient for the stability testing study of prepared Lip Balm.[9]

Table 1: Formulation of Lip Balm:

Sr.No.	Ingredients	F1(%)	F2(%)	F3(%)	Uses
1	Walnut Oil	4	8	-	Active Ingredient (Antioxidant, Anti-inflammatory)
2	Red Dragon Fruit Juice	11	11	11	Colouring agent
3	Bees Wax	12	12	12	Glossiness and Hardness
4	Almond Oil	5	5	5	Moisturizing agent
5	Vitamin E	1.5	1.5	1.5	Antioxidant, Maintain stability
6	Rose Oil	2	2	2	Flavouring Agent

EVALUATION OF LIP BALM

Organoleptic Properties:

The formulation was studied for physical Appearance, colour and odour. These Characteristics were evaluated by physical Observation. Texture and homogeneity were tested by pressing a small quantity of the Formulation between the thumb and index finger. The presence of coarse particles and Consistency were used to evaluate the texture and homogeneity of the formulations. Skin feel (including stiffness, greasiness, and grittiness) was also evaluated.

Texture:

The formula lip balm sample is placed on slide. Texture analysis of Lip balm has been recorded by organoleptic evaluation. [2]

Colour: Lip balm colour analysis was evaluated. The three readings that contribute to the brightness, redness of the sample being examined. [2]

Odour: The pleasant odour is present due to the presence of Rose oil. [2]

Greasiness (appearance): The oil test was reviewed to determine the amount of oil in a formulated lip balm. In this study 1 gram of lip balm was placed on filter paper and the sample was left at room temperature for 24 hours.[2]

Table 2: Organoleptic Properties:

Parameters	Observations
Texture	Smooth and Soft
Colour	Faint Pink
Odour	Pleasant
Appearance	Excellent

pH test:

The lip balm was checked for its pH as it is responsible for the stability and irritability at the

application site. The digital pH meter was used to determine the pH of the prepared lip balm. The measurement was performed three times.[9]

Melting point:

A Melting Point instrument was used to determine the melting point. In short, a sealed formula is supplied from one end of the capillary tube into the capillary until it reaches a specific height. After inserting the capillary into the melting point device, the temperature at which the molten mass is measured is noted.[10]

Softening Point:

The temperature was raised linearly while the softening point was ascertained using the orbital shaker. Up to 60 degrees Celsius. [11]

Perfume stability:

To assess the lip balm's perfume stability, batches were kept at room temperature at 25ºC for a month. The scent was verified as well. [12]

Skin irritability:

Applying the substance as a patch to the skin for 30 minutes and watching for the following reactions is how to determine skin irritability: N = no reaction; R = skin redness; and I = irritation or itching. [13, 14]

Spreadability Test:

Spreadability is determined using a slide. The formulation is sandwiched between two blades and a load is applied; the recipe has been spread on the slides. Visual observations were made regarding the uniformity of the layer formation.[2]

Surface anomalies:

Any surface imperfections, such as the lack of crystal formation on the surfaces or any mold or microbial contamination, were examined. [15]

Breaking point:

The breaking point method was used to evaluate the lip balm's strength. The lip balm was held horizontally in a socket, an inch from the support's edge. The weight at which it broke was considered the breaking point. The weight was gradually increased by a predefined quantity (10 gm) at predetermined intervals of 30 seconds. [16, 17]

Stability Test:

The lip balm's formulation has been tested for stability over a 30-day period at a range of temperatures, namely room temperature (25±2°C), higher oven temperatures (40±2°C), and

refrigerator temperatures (5±2°C). On days 7, 15, and 30, characteristics like spreadability and organoleptic qualities were assessed.

Table 3: Stability studies of lip balm at different temperature:

Temperature	Colour	Odour	Spreadability	Melting Point	pH
25℃ ± 2℃	Faint Pink	Pleasant	Good, Uniform	63°C	7.1
5℃ ± 2℃	Faint Pink	Pleasant	Good, Uniform	63.5°C	7.1
40℃ ± 2℃	Faint Pink	Pleasant	Intermediate	65°C	7.2

Preliminary Stability Test:

Formula evaluated on preliminary stability tests including physical properties (colour, odour and appearance) and flow testing. Since this formula does not cause any physical or balance changes, it has been tested for normal stability.

Normal Stability Study:

An amount of 25 g of the substance has been prepared for routine stability testing, where the physical properties (colour, odour, and appearance), flow ability and the melting point was evaluated for 5 days at room temperature. Samples are well preserved. [2, 18]

RESULTS AND DISCUSSION

In the present study many herbal ingredients like Almond oil, vitamin E capsules, Beeswax, Red Dragon fruit, Rose oil can help to provide moisturizing and healthy lips. The Walnut oil can help to provide antioxidant and anti-inflammatory effect. The prepared Lip balm was evaluated for organoleptic characteristic like colour, odour, texture, appearance was evaluated. Then the Melting point, Spreadability, Stability, pH and stability studies performed. After performing the stability studies at room temperature 25℃ ± 2℃, Refrigeration 5℃ ± 2℃ and oven temperature 40℃ ± 2℃ for 30 days. It was concluded that prepared Lip balm shows uniform application without any deformation at any temperature. The melting point 63℃ and 65℃ and mean pH which is nearest to the neutral pH. Three formulations F1, F2, and F3 were prepared by altering the ingredient ratios and then assessed for their physical and chemical properties.

Table 4 Evaluation and Results:

Sr.No.	Evaluation Parameters	Observed Values
1	Colour	Faint Pink
2	Odour	Pleasant
3	Appearance	Smooth
4	Melting Point	63°C-65°C
5	Test of Spreadability	Good, Uniform
6	pH measurement	7.1
7	Skin Irritation	No
8	Breaking Point	29gm

CONCLUSION

In this study walnut oil, red dragon fruit, almond oil, vitamin E and rose oil are used to we are prepare the herbal lip balm. We prepare the herbal lip balm are applied to many volunteers, In the herbal lip balm are not produce the any irritancy to lip. It is very safe and effective and not contain any irritability. It provides the satisfactory effect. We prepare the lip balm are have the many properties like, it provides the beauty and shine to lips, avoid the dryness of chapped lips, protect from the UV rays and environment pollution, provide the hydration and smoothness to the lips.

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