

# Formulation and Evaluation of Herbal Lip balm using *Alkanna tinctoria* and *Rosmarinus officinalis*

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## ABSTRACT:

This study accomplishes to formulate and evaluate herbal lip balm using *Alkanna tinctoria* and *Rosmarinus officinalis*. Lip balms are topical preparations used to guard and moisturize lips. They are widely used to enhance the beauty of lips. Synthetic lip balms have huge chemical ingredients posing a risk of side effects. These days focus has shifted more towards naturally prepared herbal cosmetic products. Substantially herbal lip balm are made by pigments extracted from herbs. In this study *Alkanna tinctoria* root was used as colour pigment to formulate lip balm, along with other ingredients and was evaluated for several parameters like pH, melting point, stability, spreadability etc. The herbal lip balm was made using naturally occurring base, oil extracts, colour and flavouring agents. The formulated lip balm exhibited pleasant flavour and smoothness, adherence and easy intentional removal was also observed. Further, safety and stability studies at different storage conditions need to be carried out.

**KEYWORDS:** *Alkanna tinctoria*, *Rosmarinus officinalis*, lip balm, cosmetic, colour pigment

## INTRODUCTION:

Cosmetics theaters a noteworthy role. Cosmetics are described as products presumed to be rubbed, sprinkled or sprayed and which are available for cleansing, beautifying and promoting attractiveness. Cosmetics are substances which are used to enhance the appearance of human body<sup>1</sup>. Natural produces have been used since many years. Nowadays, people are relying more on herbal products due to their safety. This has paved way for herbal cosmetics in personal care. Herbal plants are cultivated all over the world. Herbal cosmetics for skin and hair care are becoming very prevalent for their steadfastness. Herbal cosmetics provide soothing appearance, healing, enhancing and conditioning properties.

Lips are soft pliable anatomical structure that form mouth margin of humans. It does not contain any oil gland. They need hydration and protection in all seasons. Lipbalms are used for both colouring and moisturizing purpose<sup>2</sup>. However the synthetic ingredients in them cause toxicity, allergic reactions etc. Often the applied lip balm are eaten away and ingested<sup>3</sup>. Therefore it becomes mandatory for the health regulators to approve them with caution. Herbal materials are natural, sign of safety, satisfaction surety and cause less or no harm to the users. Natural colours are less toxic compared to synthetic colours. *Alkanna tinctoria* root is one such herb which can be used to formulate herbal lip balm. It exerts good colouring properties for hair and nails. It is also beneficial for skin and it acts as febrifuge, antihypertensive, cardiotonic, anti-inflammatory and used to treat heal burn scars etc. *Alkanna tinctoria* and virgin coconut oil used for the formulation of this herbal pigmented lip balm is exploited for its blending properties and imparting the lip balm to coat as thin film.

Common ingredients used in herbal lip balm formulation are:

Base, Oils, Colouring agent and Flavouring agent.

### Base:

Waxes forms an important group of ingredients for formulation of cosmetics. Bees wax is one of the commonly used waxes in the formulation of lip balms. It is a natural constituent that exhibit properties that, helps to retain skin moisture by making it helpful for chapped lips and dry lips. Bees wax has antibacterial activity and is helpful in subsiding inflammatory pain. Bees wax is rich in vitamin A and aids in protecting the skin against UV radiation, improves wound healing, stimulates skin cells and also reduce wrinkles<sup>4</sup>.

Cocoa butter is a natural fat that is obtained from cocoa bean and it gives a smoothness and gentleness to lip balm. It promotes and nourishes lips and helps to restore chapped and dehydrated lips. 3 to 10% of White bees wax is one more significant and beneficial component of lip balm. It binds oils and high melting point waxes. On cooling, bees wax solidify thus favoring formulation of lip balm.

### Oils:

Oil is prerequisite to blend appropriately with the waxes and also to provide an appropriate film on applying to lips. This helps in forming a thin film over the applied surface. It also gives a good gloss to lips, moisturizes lips, promotes elasticity and provides protective barrier.

Almond oil, a pale yellow oil consisting of glycerides chiefly of oleic acid along with linoleic, myristic and palmitic acid act as a emollient. It has a distinguishing aroma. It is very graceful and pacifying on lips<sup>4</sup>.

Virgin coconut oil- It hydrates the skin and helps to retain moisture. It has properties such as anti-inflammatory and antioxidant. It prevents skin infections and also acts as a protective barrier<sup>5</sup>.

### Colouring agents:

The primary purpose of colorants is to give cosmetics goods a unique look. Since ancient times, color has been a part of cosmetics. Essentially, sight, touch, and scent are the three senses that influence a person's willingness to purchase cosmetics. An essential component of cosmetic composition is color. There are two methods to add color to the lips:

1. By applying a dye solution that can pierce the skin's outermost layer to the lips.
2. By applying a colored coating to the lips, which helps to conceal any uneven skin tone and provide the illusion of smoothness.

**Alkanet root-** It is a dye plant. Alkanet is a biennial or perennial herbaceous plant that grows about 0.3m and 0.6m in height. The plant produces blue to purple trumpet shaped flowers in loose, 1- sided scorpioid racemes.

Botanical name: *Alkanna tinctoria* Traditional name: Ratan jot Origin: Mediterranean region Taste: Bitter, astringent taste Shape: Minute nut like fruits Family: Boraginaceae

The leaves have sparse white hairs on their upper sides, hairs along their margins, and a white “fur” on their lowerside. Flowering normally takes place from June and July. The plant has dark red root of blackish appearance externally but red inside with whitish core. It is widely used as a potent resource for its medical properties and as colouring pigment<sup>6</sup>. It contains naturally occurring chemicals, mainly a naphthoquinone derivative called alkannin. It is used as Anti – inflammatory, anti-viral, anti-aging and anti-oxidant and also used to treat stomach related problems. It also finds use for body detox, hair care and skin care. It helps to treat burn scars in addition to preventing skin infections and also has cooling ability to take heat out of the skin. It imparts a ruby red colour. Hence, in this research, it is chosen as natural colorant.

### Flavouring Agent:

Flavouring agent is used to enhance the product. Flavourants are selected on the basis of the taste and colour of drug. Flavours used in lip balms are:

**Rosemary** – Rosemary (*Rosmarinus officinalis*) is an evergreen bushy shrub which grows along the Mediterranean sea and sub-Himalayan areas. It is a shrub with fragrant, needle-like leaves and white, pink, purple or blue flowers which belongs to the family Lamiaceae<sup>7</sup>. Rosemary oil has potent antimicrobial and antiseptic qualities that helps in reducing dermatitis, oily skin and acne. It is rich in antioxidants that effectively works to cure dryness, darkness and chapped lips. It also heals the cuts on lips caused due to dryness<sup>7</sup>.

**Silver mica** – It is a coloured powder that is made from a natural mineral called muscovite. Muscovite is a silicate mineral belonging to family of quartz. They maintain brightness for longer time without fading. It is easy to use. It works great when added to lip balm which gives glossy appearance. It imparts a very high shimmer.

Thus, using the above ingredients an attempt is made to formulate herbal lipbalm and further evaluate the same.

## MATERIALS AND METHODS:

### Materials:

*Alkanna tinctoria* roots and rosemary leaves were procured from Bangalore local market and authenticated. Bees wax, cocoa butter, coconut oil, almond oil, Silver mica of analytical grade was purchased.

### Methods:

#### Preparation of alkanet extract by infusion:

1. Desired amount of alkanet root powder is taken in a heat-resistant container. Carrier oil – Virgin coconut oil is added so as to cover the powder completely.
2. A double boiler is set up using water. Place the container with the alkanet root powder and oil mixture into the double boiler. Heat the mixture gently for about 1-2 hours, stirring occasionally.
3. After the infusion period, remove the mixture from heat and let it cool slightly.
4. Strain the oil through a cheesecloth to remove the alkanet root powder particles. We now get alkanet-infused oil.

#### Isolation of rosemary oil:

1. Desired amount of crushed Rosemary leaves are taken in a round bottom flask.
2. Enough water is added such that it covers the plant material.
3. Set the Clavenger's apparatus.
4. Apply heat of 100°C. The water will begin to boil, and the steam will carry the volatile essential oils from the rosemary leaves.
5. As the steam rises, it passes through the water condenser, where it cools and condenses back into liquid form. The rosemary essential oil, being less dense than water, will float on top of the condensed liquid in the receiving end.
6. Rosemary oil is collected and stored in amber coloured bottle.

**Formulation of herbal lipbalm:**

1. Calculated amount of raw materials (Table 1) were used for preparation of 4 formulations (F1 to F4).
2. Required quantity of Alkanet root and coconut oil was used to prepare infusion as described above.
3. The herbal lip balm was formulated using alkanet root extract, rosemary oil, bees wax, cocoa butter, coconut oil, almond oil, and silver mica<sup>8</sup>.
4. As per the general method of formulation, bees wax and cocoa butter were melted in porcelain dish on water bath with the decreasing order of melting point.
5. Then almond oil was added to same porcelain dish at the same temperature.
6. Using virgin coconut oil, *Alkanna tinctoria* (alkanet root) which was extract was added to the porcelain dish and to the same porcelain dish silver mica as shining agent is added.
7. Calculated amount of Rosemary essential oil extracted using Clavenger's apparatus was added.
8. The mixture was transferred to the lip balm mould and allowed to solidify by keeping in ice bath.
9. According to the protocol described above, different formulation composition was prepared and further subjected to evaluation<sup>9</sup>.

Table 1: Formulation of lip balm

| Sl no | Ingredients            | Quantity(gm) |       |       |       | Category            |
|-------|------------------------|--------------|-------|-------|-------|---------------------|
|       |                        | F1           | F2    | F3    | F4    |                     |
| 1     | Alkanet root powder    | 6g           | 6g    | 6g    | 6g    | Colouring agent     |
| 2     | Rosemary essential oil | 1.5ml        | 1.5ml | 1.5ml | 1.5ml | Perfume             |
| 3     | Bees wax               | 1.5g         | 2g    | 3g    | 3.5g  | Glossy and hardness |
| 4     | Cocoa butter           | 1g           | 1g    | 1g    | 1g    | Glossy and hardness |
| 5     | Coconut oil            | 1ml          | 2ml   | 2.5ml | 3ml   | Carrier Oil         |
| 6     | Almond oil             | 1ml          | 1ml   | 1ml   | 1ml   | Blending property   |
| 7     | Silver mica powder     | qs           | qs    | qs    | qs    | Shine               |

**Evaluation:****1. Organoleptic properties:**

The formulated herbal lip balm was studied for colour and texture. This helps to evaluate the texture and homogeneity of the formulation.

**2. Melting point:**

The sample of lip balm was taken in glass capillary whose one end was sealed by flame. The capillary containing drug was dipped in liquid paraffin inside the melting point apparatus. The temperature at which melting occurs was determined.

**3. Test for spreadability:**

On a glass slide, the lip balm formulation was applied, and upon observation, deformation fragmentation were noted, allowing for comparison with the standard formulation<sup>10</sup>.

**4. pH:**

The pH measurement was performed using pH meter.

**5. Surface anomalies:**

Herbal lip balm was stored for a particular period to detect the formation of crystals, wrinkles and growth of mould and fungi.

**6. Aging stability:**

Herbal lip balm stability was determined by storage at various temperatures ranging from 4°- 40°C.

**7. Softening point:**

To determine the resistance, the formulated herbal lip balm was kept at varying temperature conditions that is hot and cold and observed.

**8. Perfume stability:** Odour of the formulated herbal lipbalm was determined 30days after formulation.**RESULTS:**

Photo 1 is the final product.



**Photo 1.- Herbal lip balm final product**

**Table 2: Evaluation of Herbal Lip balm**

| Sl No | Parameters                     | Observations   |                         |                  |                  |
|-------|--------------------------------|----------------|-------------------------|------------------|------------------|
|       |                                | F1             | F2                      | F3               | F4               |
| 1     | <b>Organoleptic properties</b> | Maroon, smooth | Dark cherry red, smooth | Wine red, smooth | Wine red, smooth |
| 2     | <b>Melting point</b>           | 6.0            | 6.0                     | 6.1              | 6.1              |
| 3     | <b>Test for Spreadability</b>  | Smooth         | Smooth                  | Excellent        | Sticky           |
| 4     | <b>Breaking point</b>          | 110g           | 120g                    | 150g             | 130g             |
| 5     | <b>pH</b>                      | 5.7            | 5.8                     | 5.8              | 6.1              |
| 6     | <b>Surface anomalies</b>       | Sweating       | Sweating                | No defect        | No defect        |
| 7     | <b>Aging stability</b>         | Oil bleed      | Oil bleed               | Smooth           | Slightly hard    |
| 8     | <b>Perfume stability</b>       | Slight         | Slight                  | Good             | Good             |

From the results obtained above, it was observed that formulation F3 were found to be satisfactory.

## DISCUSSION:

A satisfactory formulation of lip balm will exhibit desirable organoleptic properties, have an appropriate melting point, excellent spreadability, a suitable breaking point, pH balance, smooth surface, good aging and perfume stability. These qualities ensure that the lip balm not only provides effective hydration and protection for the lips but also offers a pleasant sensory experience for the user. All these parameters were observed in Formulation 3 and hence F3 is found to be ideal.

## CONCLUSION:

The Herbal lip balm containing alkanet root and rosemary oil were found to be satisfactory. The prepared formulations were evaluated for various evaluation parameters like color, texture, spreadability, melting point, pH, stabilities studies, skin sensitivity. Among the various formulations prepared, F3 was found to be ideal.

**CONFLICT OF INTEREST:** The authors have no conflicts of interest regarding this investigation.

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