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Research Article

Formulation and Evaluation of Coffee Beans Herbal Lip Balm

Raushani Kumari*, Dr. Rajesh Kumar Nema, Chandrababha Dewangan

Rungta Institute of Pharmaceutical Sciences and Research, Kohka, Kurud, Bhilai, 490024, Chhattisgarh, India.

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ABSTRACT

Cosmeceuticals are the products of cosmetic that are biologically active ingredients that impersonates to medical or drug like benefits. The design, quality, formulation of lip balm made from coffee beans, aloe vera, vitamin E and cocoa powder. Homogenous mixing method was used to parameters such as chemical stability, pH and Spreadability were carried out for the evaluation of lip balm. The pH was found to be 5.03. after performing stability studies at room temperate (25.0 \pm 3.0-degree c), refrigerated condition (4.0 \pm 2.0-degree c), it proved that prepared lip balm was uniform in nature, was perfectly applied, without any deformation. Lip balm prepared from above ingredients could be a better option for treatment of various lip issues.

INTRODUCTION

Coffee beans can be an excellent ingredient in a homemade herbal lip balm. Ground coffee beans or coffee-infused oil are popular choices because of their natural antioxidants, mild exfoliating properties, and energizing scent. Coffee beans, rich in antioxidants and beneficial nutrients, are increasingly recognized as a valuable ingredient in herbal lip balm formulations. The antioxidants found in coffee, including caffeine and polyphenols, are known to protect skin from environmental damage by combating free radicals, making coffee-infused lip balms especially beneficial for maintaining healthy lips.

Additionally, ground coffee beans offer mild exfoliating properties, gently removing dead skin cells and leaving lips smoother and softer. The caffeine in coffee also stimulates blood flow, potentially giving lips a naturally fuller appearance and enhancing overall lip health. Coffee-infused oil, often used in lip balm recipes, blends well with other moisturizing ingredients such as beeswax and coconut oil, creating a product that helps retain moisture, soothes dry, chapped lips, and prevents further dehydration.

***Corresponding Author:** Raushani Kumari

Address: Rungta Institute of Pharmaceutical Sciences and Research, Kohka, Kurud, Bhilai, 490024, Chhattisgarh, India.

Email ✉: kraushani627@gmail.com

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Fig. 1 (Coffee Beans)

The skin is the body's largest organ it covers the entire body. It serves as a protective shield organs heat, light, injury and infection, the skin also regulates

1) Regulate body temperature

- When the body gets too warm, sweat glands in the skin produce sweat, which cools the body as it evaporates

2) Store Water and Fat.

- Helps maintain hydration levels in the body and supports cellular functions.
- Provides energy reserves, insulation to maintain body heat.

3) Prevent Water Loss

- The skin's outer layer, the epidermis, contains a lipid barrier that prevents excessive water from evaporating, this barrier ensures the body retains the moisture it needs for proper cellular activity and prevents dehydration, especially in dry environments.

3) Prevent Entry of Bacteria

- The skin acts like a strong, protective wall with built-in defences to keep harmful germs out. Skin type is primarily determined by genetics, but it can also change over time due to various factors. The five main types of healthy skin are normal, dry, oily, combination, and sensitive. Cosmetics play a significant role in modern lifestyles, and there is an increasing trend toward natural and eco-friendly products in the industry. Many consumers now prefer herbal cosmetics as they align with the demand for organic, sustainable, and health-conscious options. Herbal products have been used for thousands of years in traditional medicine, valued for their antimicrobial, anti-inflammatory, and other therapeutic properties. Cosmetics made from herbal extracts, especially for skin and hair, are popular for their reliability and perceived safety compared to synthetic products, which may have adverse effects. One example is lip balm, which creates a protective layer on the lips to seal in moisture and shield from environmental exposure. The unique structure of lip skin—thinner and with fewer protective features like melanin, sweat glands, and oils—makes it more prone to dryness, requiring special care to maintain hydration and health. Herbal products, used for thousands of years in folk medicine, are known for their pharmacological properties, such as antimicrobial, anti-inflammatory, and cytostatic effects, making them beneficial for both skincare and overall wellness. Herbal extracts are cultivated worldwide and are highly valued in the horticulture sector. Cosmetics formulated with herbal ingredients, like those for skin and hair, are celebrated for their safety and efficacy. These products include formulations such as lip balms,



creams, and shampoos, all crafted to utilize nature's benefits.

Anatomy Of Lip

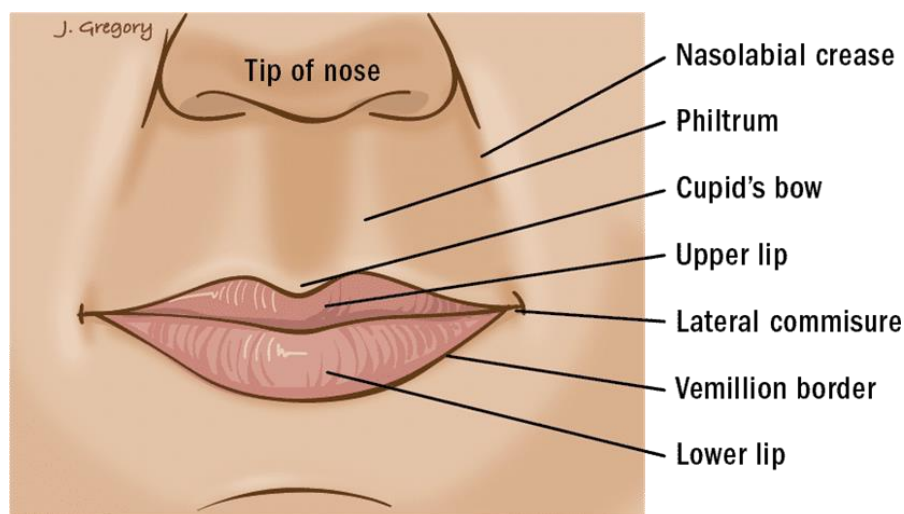


Fig. 2

The 5 major zones are vermilion/white roll, sub vermilion, peristomal, philtra column, and commissural. The lips are a highly specialized part of the face with unique anatomy and important functions. Structurally, the lips are divided into distinct zones, each serving specific purposes. The vermilion is the red part of the lips, covered by a thin layer of specialized squamous. Its red colour comes from the high number of blood vessels close to the surface. Surrounding the vermilion is the cinnabar border, a lighter skin boundary that separates the lips from the rest of the facial skin. The Cupid's bow, the "M-shaped" outline on the upper lip, adds to the aesthetic appeal of the lips, which are crucial for facial expressions. Internally, the lips consist of the subvermilion, a dry area beneath the vermilion, and the peristomal zone, where the dry lips meet the wet mucosa of the inner lip. This inner mucosa is soft and moist, folding onto the gums to create distinct upper and lower midline creases. In newborns, the mucosa contains sebaceous glands and papillae, which are

adaptations for feeding. The corners of the mouth, or commissures, are where the upper and lower lips meet. These are attachment points for several facial muscles, including the orbicularis oris, which surrounds the mouth and enables a wide range of movements, such as speaking, eating, and smiling. The lips are highly sensitive due to their rich supply of nerve endings and vascular papillae, especially along their edges. This sensitivity plays a crucial role in tactile perception and fine movements, making the lips essential for tasks like sucking in infants and precise articulation in speech. Additionally, the shape and size of the lips vary widely among individuals, influenced by age, genetics, and ethnicity, contributing to their unique role in facial identity and beauty. Functionally, the lips are indispensable for daily life. They are involved in suction, aiding in drinking and eating, and in speech, as they help form words and sounds. They also play a significant role in non-verbal communication, expressing emotions like happiness, anger, and sadness. The lips' dynamic

nature, supported by skin, muscles, and mucosa, allows them to adapt to diverse functions while maintaining their protective barrier against external elements. This combination of structure and function makes the lips a vital feature of human anatomy.

3. Lip Balm

Lip balms are moisturizers for lips that help to prevent dryness and protect against harsh weather. They are similar to lipstick in some ways, as both are stick-like and need to be smooth, stable in different temperatures, and easy to apply and remove. However, unlike lip gloss, which is mainly for shine, lip balm focuses on hydration and protection. It can be used by anyone, regardless of gender. The main ingredients in the lip balm are coconut oil, beeswax, aloe vera, coffee beans (powder), shea butter. These ingredients make the balm solid and smooth, while also keeping the lips soft.

Applications of Lip Balm

1. **Moisturizes Lips:** Keeps lips soft and hydrated, preventing dryness and cracking.
2. **Protects Against Weather:** Shields lips from harsh weather conditions like cold, wind, and heat.
3. **Natural Healing:** Helps repair damaged or chapped lips with natural ingredients.
4. **Safe for Everyone:** Suitable for all genders and ages due to its gentle and chemical-free formula.
5. **Long-Lasting Effect:** Provides lasting moisture and protection throughout the day.
6. **Daily Use:** Can be used regularly without causing harm, making it ideal for routine lip care.

5. Advantages of Lip Balm

1. Lip balms help to protect the natural health and beauty of the lips.
2. Sun block lip balms are proved to prevent ultraviolet rays from hurting the lips.
3. they are not gender specific products and both men and women can use them.
4. Lip balm products help to protect lips affected by cold sores, chapping and dryness.
5. contact of the product with the skin will not cause a sensation of friction or dryness, and should allow the forming of a homogeneous layer over the lips in the order to protect the labial mucous susceptible to environment factors such as UV radiations, dryness and pollution.
6. It refreshes, renews and also addresses lip-related symptoms resulting from colds, flu and allergies.

6. Disadvantages of Lip Balm

1. Lip balms made of low-quality ingredients can harm the lips seriously. Such lip balms may dry out the lips instead of moisturizing them.
2. Lip balm addiction is another disadvantage usually seen with the use of them.
3. Compared to commercially prepared lip balms, they tend to stay on the lips for a shorter duration of time. Thus, they need to be reapplied often.
4. Some companies manufacture lip balms considering only the beauty aspect, ignoring the health benefits and soft character of the skin. Such products will gradually damage the natural colour, softness and the glow of the skin.
5. The naturally derived colours and flavours are more difficult to obtain and also have issues related to stability in the product.



6. Natural oils have other disadvantages such as greasier, comedogenic

MATERIALS AND METHODS

S No.	Items	Quantity taken
1.	Coffee Beans	10g
2.	Coconut Oil	1.5 ml
3.	Beeswax	1.25g
4.	Shea Butter	1.0g
5.	Vitamin E Oil	0.1ml
6.	Aloe vera	0.5ml
7.	Cocoa powder	0.15g

Coffee Beans



Fig. 3

Coffee beans are a great ingredient in herbal lip balm because they're full of antioxidants, natural oils, and nutrients that keep lips soft and healthy. The antioxidants in coffee help protect lips from things like sun damage and pollution, which can make them dry and chapped. The natural oils in coffee beans are also excellent for locking in moisture, so lips stay smooth and hydrated. Finely ground coffee can gently exfoliate, removing dry skin and making lips feel smoother. Plus, the smell of coffee is uplifting, and it can add a soft, natural

colour to the lips. To make coffee-infused lip balm, crushed coffee beans are soaked in an oil like coconut or almond oil. This coffee-infused oil is then mixed with other natural ingredients like cocoa butter or beeswax, which add more moisture and protection to the balm.

Coconut Oil



Fig. 4

Coconut oil is a popular ingredient in herbal lip balm because it's highly moisturizing, natural, and packed with nutrients that keep lips soft and healthy. It contains fatty acids like lauric acid, which deeply hydrate and nourish the lips, helping to prevent dryness and cracking. Coconut oil is also naturally antibacterial, which helps protect lips from potential infections, especially on chapped or damaged skin. Additionally, coconut oil's smooth, lightweight texture allows it to be easily absorbed, leaving lips soft without feeling heavy or greasy. Its mild, pleasant scent is a nice bonus in lip balms, adding a subtle tropical aroma. When combined with other natural ingredients like beeswax or shea butter, coconut oil creates a smooth, protective layer on the lips, sealing in



moisture and keeping them hydrated throughout the day.

Beeswax



Fig. 5

Beeswax is a key ingredient in herbal lip balms due to its protective and moisturizing properties. As a natural wax made by honeybees, beeswax forms a light, protective barrier on the lips that helps lock in moisture, keeping them hydrated for longer. This barrier also shields lips from harsh environmental factors like wind and cold, which can cause dryness and chapping. Beeswax has a slightly sticky, pliable texture that allows it to blend well with oils and butters, creating a smooth, solid balm that's easy to apply. Rich in vitamin A, beeswax also promotes skin healing, making it especially helpful for dry or cracked lips. Its subtle, honey-like scent adds a gentle fragrance, and it's naturally hypoallergenic, making it suitable for sensitive skin. Combined with moisturizing ingredients like coconut oil or shea butter, beeswax creates a long-lasting, nourishing lip balm that keeps lips soft and healthy.

Aloe Vera



Fig 6

Aloe vera is a highly beneficial ingredient in herbal lip balms due to its ability to nourish, heal, and protect the lips. It is well-known for its excellent moisturizing properties, which help lock in hydration and prevent dryness, leaving the lips soft and smooth. Aloe vera also has soothing and calming effects, making it an effective remedy for irritated, cracked, or sensitive lips by reducing redness and discomfort. Additionally, it promotes the healing of damaged skin with its rich blend of vitamins, minerals, and enzymes, helping to restore the natural smoothness of the lips. Beyond hydration and healing, Aloe vera forms a protective barrier on the lips, shielding them from harsh environmental factors such as wind, cold, and sunlight. These combined properties make Aloe vera an essential ingredient in natural lip care products, ensuring lips stay healthy, soft, and well-protected.

Vitamin E Oil





Fig. 7

Vitamin E oil is a highly beneficial ingredient in herbal lip balms because of its powerful antioxidant and healing properties. As an antioxidant, it helps protect the lips from environmental damage, such as sun exposure and pollution, which can cause dryness and premature aging. Vitamin E oil is also incredibly nourishing and hydrating, helping to soften and smooth the lips. It supports skin repair by promoting cell regeneration, making it especially useful for healing chapped or cracked lips. Additionally, Vitamin E acts as a natural preservative in lip balms, extending the shelf life of other oils and ingredients. When blended with other moisturizing ingredients like coconut oil, shea butter, and beeswax, vitamin E oil enhances the balm's ability to soothe, protect, and keep lips soft and healthy.

Cocoa Powder



Fig. 8

Cocoa powder is a beneficial ingredient in herbal lip balms thanks to its antioxidant, soothing, and hydrating properties. Rich in flavonoids, it protects lips from environmental damage and slows signs of aging. Its natural fats nourish and soften dry, chapped lips, while its mild caffeine content boosts circulation for a fuller appearance. The pleasant chocolate scent adds a comforting aroma. Combined with ingredients like beeswax, shea butter, and coconut oil, cocoa powder helps create a lip balm that keeps lips soft, smooth, and healthy.

Extraction of coffee beans

Maceration process: a simple method where coffee powder is soaked in ethanol at room temperature for 24 hours or with slight agitation to extract desired compounds over time.



Fig 8.1



fig 8.2



fig8.3



fig8.4



Fig 8.5



fig8.6



fig8.7

9. METHODS

9.1. Infuse the Oil:

- Take your base oil, such as coconut oil, and gently heat it on low heat.
- Add coffee grounds to the oil and let it simmer for about 10–15 minutes. This allows the coffee essence to infuse into the oil.
- Strain the mixture using a fine mesh strainer or cheesecloth to remove any coffee solids.
- Set aside the infused oil for the next step.

9.2. Melt the Ingredients:

- In a double boiler or a heatproof bowl over simmering water, add the solid ingredients:
 - Beeswax (grated or in pellets)
 - Shea butter
- Gently heat the mixture until it is fully melted, stirring occasionally to combine.
- Once melted, mix in the coffee-infused oil and stir well.



9.3. Incorporate Additives:

- Remove the melted mixture from heat.
- Quickly stir in the additional ingredients:

O Aloe vera gel for moisturizing and soothing.

O Vitamin E oil for its antioxidant and nourishing properties.

O Cocoa powder for added aroma and benefits.

- Mix thoroughly to ensure all ingredients are well blended.

9.4. Pour and Set:

- Carefully pour the warm liquid balm into clean lip balm containers, tins, or small jars.

- Let the mixture cool at room temperature for 1–2 hours until it solidifies completely.

9.5. Store and Use:

- Once the balm is fully set, seal the containers with their lids.
- Store in a cool, dry place to maintain its quality and consistency.
- Use the lip balm as needed to keep your lips moisturized, soft, and nourished.

□ Weigh all the ingredients

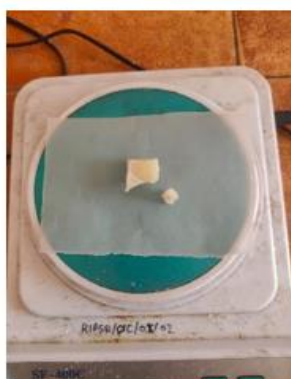


Fig 1(beeswax)



fig2 (Shea butter)



fig3(Extraction of
Coffee powder)



fig4(Aloe vera)



Fig5 (Vitamin E capsule)



fi6(Coconut oil)



fig7(Cocoa powder)



Fig8



fig9

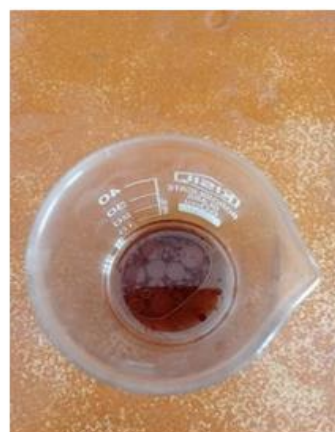


fig10

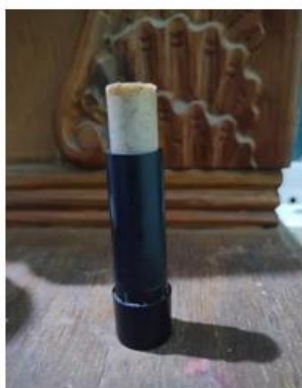


Fig11

Evolution of libbalm

Chemical Evolution

Hager's Test: add a few drops of picric acid solution to the sample formulation of pricipitate indicates the presence of alkaloids.



Fig a

- Wanger's test: add wanger's reagent to the sample. The formulation of reddish brown precipitate indicates the precence of aklaloids.





Fig b

10.2. Physical Evaluation: physical parameter such as colour, appearance and consistency were checked visually.

- **pH:** pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant temperature.



Fig c

- **Spreadability:** 1 ml of cream was weighed and put on a glass plate and the help of another glass plate with 45 degree angle spread the cream and observation has been taken.



Fig D

CONCLUSION

In summary, developed herbal based lip balm formulation by using coffee beans and aloe vera which provide antioxidant and stable, smooth and efficient as marketed products. Natural pigments were found to be compatible with excipient used to prepare lip balm. The developed lip balm bathes showed good quality, colour, appearance, texture, perfume, stability, pH, spread ability, softening point and no skin irritation.

REFERENCES

1. Articles on the antioxidant properties of coffee, such as studies published in the Journal of Cosmetic Science or Food and Chemical Toxicology.
2. Cosmetic ingredients database: Paula's Choice Ingredient Dictionary and EWG's Skin Deep database provide detailed information about the properties of coffee, caffeine, and related components in skincare.
3. Skincare and Coffee Research: Studies on caffeine's effect on skin and blood circulation, such as those published in The Journal of Dermatological Science.



4. Online Source: Websites like Healthline and WebMD often discuss coffee's benefits for the skin, including its antioxidant and exfoliating properties.
5. Herbal Medicine: Biomolecular and Clinical Aspects (2nd Edition), edited by Iqbal Ahmad and Mohammad M. Rahman – This book covers the pharmacological benefits of herbal ingredients used in cosmetics.
6. Natural Cosmetic Formulation by Stephen A. S. The complete guide to natural skincare products, their properties, and safety.
7. Herbal Skincare: How to Make Your Own Natural Beauty Products by Stephanie Tourles – This book explores the use of herbal extracts for skin care, focusing on their healing, antimicrobial, and anti-inflammatory properties.
8. Herbal Medicines for Skin and Hair Care by Reiko T. – This book provides an overview of the role of herbal medicines in maintaining healthy skin and hair
9. Cosmetic Formulation: Lip Care Products” in Handbook of Cosmetic Science and Technology - This chapter focuses on the formulation and types of lip care products, including lip balms, discussing their role in lip protection, stability, and market trends.
10. Scientific American and The New York Times have articles discussing the psychological concept of "lip balm addiction,"
11. Journal of Cosmetic Dermatology frequently publishes studies on how low-quality ingredients in cosmetics, including lip balms, can harm skin, leading to dryness and other issues.
12. Cosmetic Formulation of Skin Care Products" by Zoe Diana Draelos - This book provides detailed steps and methods for creating various cosmetic products, including lip balms, using natural and herbal ingredients.
13. DIY Beauty: Homemade Recipes for Skin, Hair, and Lip Care" by Caroline Weisz - This book contains recipes for various cosmetic products, including lip balms, and outlines similar processes for making herbal lip balms using oils, beeswax, and essential oils.
14. Articles on herbal cosmetics from journals like Journal of Cosmetic Science or International Journal of Herbal Medicine
15. Herbal Cosmetics Handbook by H. Panda.
16. Channels focusing on homemade beauty products, such as Lia Griffith or Simple Living.
17. The Complete Book of Essential Oils and Aromatherapy by Valerie Ann Worwood.
18. Natural Beauty Recipe Book by Stephanie Rose.
19. Healthline or Very well Health for detailed ingredient benefits.
20. Articles on ResearchGate or NCBI about the benefits of natural oils and antioxidants in skincare.
21. Sarkic A, Stappen I. Essential oils and their single compounds in cosmetics—A critical review. *Cosmetics*. 2018;5(1):11. doi: 10.3390/cosmetics5010011.
22. Nahata AN, Ansari NM, Nahar S, Walode SG, Chatur VM. Formulation and Evaluation of Lip balm Prepared Using Various Herbal Entities. *IJCRT*. 2022; 10(3):d122-7.
23. Mali KD, Ranwala N, Raotole HS, Rathod KP, Shukla AA. Formulation and evaluation of herbal lip rouge. *Int J Pharm Sci Rev Res*. 2019;55(1):13-7
24. Swati D, Manisha C, Manisha S, Sonia S. Preparation and evaluation of natural lipsticks



- from Bixa orellana seeds. *Int J Pharm Biol Sci.* 2013;4(3):139-44.
25. Azmin SNHM, Sulaiman NS, Yosri NA, Nor M, Abdullah P. Stability analysis of carrot-based natural moisturising lip balm. *Chem Eng Trans.* 2021;83:49-54.
 26. Sharma PP, cosmetics- Formulation, manufacturing and quality control, Edn 5. Vandana publications, Delhi, 2008, 297-313
 27. Silva D, Ferreira MS, Sousa-Lobo JM, Cruz MT, Almeida IF. Anti-inflammatory activity of *Calendula officinalis* L. Flower extract. *Cosmetics.* 2021;8(2):31. doi: 10.3390/cosmetics8020031
 28. Rajiv Gandhi R, Gowri S, Suresh J, Selvam S, Sundrarajan M. Biosynthesis of tin oxide nanoparticles using corolla tube of *Nyctanthes arbor-tristis* flower extract. *J Biobased Mater Bioenergy.* 2012;6(2):204-8.
 29. Christopulos A, Mouth anatomy <https://emedicine.medscape.com/article/1899122-overview> Sep 11, 2018.
 30. B.H. Ali, N.A. Wabel, G. Blunden, Phytochemical, pharmacological and toxicological aspects of *Hibiscus sabdariffa* L.: a review. *Phytother Res.* 19 (2005) 369-375.
 31. M.S. Balsam, E. Sagarin, *Cosmetics science and technology*, Second ed. Wiley Interscience Publication, NY, USA, 2008, 3, pp. 209-512.
 32. Fernandes AR, Dario MF, Stability evaluation of organic lip balm. *Brazilian Journal of Pharmaceutical Sciences*, 2013: 49; 293-300
 33. Mayuri Kadu, Dr Suruchi Vishwasrao, and Dr Sonia Singh, A Review on Natural Lip Balm. *International Journal of Research in Cosmetic Science.* 03 August 2014. ISSN 2277-7172
 34. Savalkar M.B. et al. Formulation & Evaluation of Herbal lipstick using *Amaranthus dubius*, *J. Pharm. Res.*, 2018, 7(6), 96-98.
 35. P. L. Kole, H. R. Jadhav, P. Thakurdesai, A. N. Nagappa, Cosmetic products of herbal extracts, *Natural Product Radiance.* 4 (2005) 4.

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