



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Research Article

Formulation And Evaluation of HERBALn Eyeshadow from Natural Coloring Matter (MUSKMELON)

Rugvedi Hiwase*, Vaishnavi Bhatkar, Roshani Garkal, Pooja Bekate, Swati Deshmukh

Shraddha Institute of Pharmacy, Kondala Zambre, Washim 444-505

ARTICLE INFO

Published: 12 May 2025

Keywords:

Herbal cosmetics,
Muskmelon, Eyeshadows.

DOI:

10.5281/zenodo.15387987

ABSTRACT

The increasing consumer demand for natural and safe cosmetic products has driven research into herbal alternatives to synthetic ingredients. This study focuses on the formulation and evaluation of an herbal eyeshadow using natural coloring matter derived from muskmelon (*Cucumis melo*). Muskmelon contains carotenoids and flavonoids, which provide pigmentation and offer antioxidant benefits. A base formulation using herbal binders, emollients, and preservatives was developed to incorporate the muskmelon extract. The finished product was evaluated for various physicochemical parameters such as color, texture, pH, spreadability, stability, and skin irritation potential. The results suggest that muskmelon-based herbal eyeshadow is a viable, skin-friendly cosmetic with acceptable aesthetic and stability properties.

INTRODUCTION

In recent years, there has been a significant shift towards herbal and organic cosmetics due to concerns about the long-term effects of synthetic chemicals on the skin. Herbal cosmetics are not only considered safer but also provide therapeutic benefits. Among various cosmetic products, eye makeup requires particular attention due to the sensitivity of the eye area.

Eyeshadows are used to enhance eye appearance and are traditionally made using artificial dyes and heavy metals, which may cause irritation or allergic reactions. Therefore, exploring natural alternatives for colorants is essential. Muskmelon (*Cucumis melo*), a commonly consumed fruit, is rich in natural pigments like beta-carotene, which can serve as a coloring agent. Moreover, muskmelon also contains vitamins A and C and antioxidant compounds, which may provide additional benefits when used in topical formulations.

***Corresponding Author:** Rugvedi Hiwase

Address: Shraddha Institute of Pharmacy, Kondala Zambre, Washim 444-505

Email ✉: hiwaserugvedi@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



The objective of this study is to formulate an eyeshadow using muskmelon-derived pigment and evaluate its safety, stability, and aesthetic properties to determine its suitability as a herbal cosmetic product.

EYE SHADOW:

Colour that is put on the skin above the eyes to make them look more attractive.



Fig.1: Eye shadow

Definition of Eye Shadow: A cosmetic cream or powder in one of various colors that is applied to the eyelids to accent the eyes. Eye shadows are formulated in the makeup of crème/gel, stick and powders, or pressed or soft[4].



Fig.2: Different colors of eyeshadow with varying shades used in accentuate the eyelids

The complete range of colours is you can get from clean white over pink shades, blues, yellows, violets and purple hues to green and even black-colored. This is a very fashion-conscious place of decorative cosmetics, the well-liked shades varying with the season and clothes that are in

fashion at the time eyeshadow is a cosmetic item that is utilized to incorporate color and definition to the eyes. It might be utilized to improve the commonplace loveliness of the eyes and to generate a variety of sees. Enhancing commonplace loveliness: Eyeshadow could be utilized to improve the commonplace loveliness of the eyes by carrying out their color and shape [4].

History of Eye Shadow:

Ancient Origins

The beginnings of eyeshadow might be traced back to the antique civilizations of Egypt and Mesopotamia [1]. These cultures were pioneers in building cosmetics by mixing commonplace pigments, micronutrients, and oils to adorn their eyes [5]. Individuals have utilized cosmetics for hundreds of years. The earliest guide archeological proof for eye makeup dates back to predynastic Egypt (c. 5000 – 4000 BCE). Traces of eye paints, most usually malachite, a green mineral, and galena, a black-colored mineral, along with cosmetic palettes, pots and applicators have been found in burials out of that period [5].

Ideal properties of herbal Eye Shadow:

- It needs to be nontoxic and non-irritating.
- Affordable and seamlessly accessible.
- Eye shadows typically made up of four types of components: bottom fillers, binders, spin, and preservatives.
- Prolonged examination executes.
- To make eye lingering doubt, there need to be a equilibrium between the fillers and binders.
- Bottom fillers are generally micronutrients as an example mica, talc or kaolin clay, that add bulk and texture to eye lingering doubt [1].

Types of eye shadow:

Eye shadow are available in the form of cream/gel, powders, and sticks either pressed or loose [6].

- Cream / gel eye shadow
- Powder eye shadow
- Stick eye shadow

- Liquid eye shadow

MUSKMELON:

Muskmelon, also known as cantaloupe, is increasingly being used in the cosmetic industry due to its numerous benefits for the skin [7]. Here are some ways muskmelon is used in cosmetics:



Fig.3: Muskmelon fruits and seeds

Benefits for Skin

- 1) Antioxidant properties:** Muskmelon is rich in antioxidants like vitamin C, vitamin E, and beta-carotene, which help protect the skin from damage caused by free radicals.
- 2) Hydrating properties:** Muskmelon is composed of about 90% water, making it an excellent ingredient for hydrating and moisturizing the skin.
- 3) Anti-inflammatory properties:** Muskmelon contains anti-inflammatory compounds like cucurbitacin E, which can help soothe and calm irritated skin.
- 4) Skin brightening:** Muskmelon contains vitamin C, which can help brighten and even out skin tone.

Overall, muskmelon's antioxidant, hydrating, and anti-inflammatory properties make it a valuable ingredient in the cosmetic industry, particularly in

products aimed at providing skin hydration, brightening, and protection [8].

PLANT PROFILE OF MUSKMELON:

Muskmelon (*Cucumis melo* L.), is a short lived, monoecious plant yields fruits of about 0.5 – 2 kg, belongs to Cucurbitaceae family which also includes cucumbers, watermelons and honeydew melons. They have local names such as cantaloupe, muskmelon, rock melon and sweet melon depending on the growing regions. The fruit shape may be round to oval, tan or straw coloured with netted peel. The yellow-orange coloured muskmelon with a network of intertwining green veins at the outside are preferred by Indian consumers. Sweetness, texture, juiciness and musky flavour are the main edible quality characteristics of muskmelon. This type of muskmelon is primarily grown in the tropical region. They are harvested at maturity stage called „full-slip“ condition. Full-slip cantaloupes turn

into gray-green colour with firm texture and maximum shelflife on proper handling.

Fig.4: Muskmelon (Cucumis melo L.) Powder

Physicochemical properties of Muskmelon:



Table.1: Physicochemical properties of Muskmelon

Sr. No.	Properties	Observation
1	Name of fruit	Muskmelon (Cucumis melo)
2	Color and Appearance	Typically orange or green flesh with a netted rind; juicy and aromatic
3	Description	Muskmelon, also known as cantaloupe, is a sweet, hydrating fruit rich in vitamins A and C. It is consumed fresh, in salads, or as juice.
4	Chemical Composition	Predominantly water (~90%), carbohydrates, vitamins, and minerals
5	Molecular Structure	Not applicable (complex mixture of organic compounds)
6	Molecular Weight	Not applicable
7	Melting Point	Not applicable
8	Physical State	Solid (flesh)
9	Solubility	High water content; soluble compounds include sugar and vitamins
10	Water Content	Approximately 90%
11	PH	Slightly acidic
12	Hygroscopic Nature	Not hygroscopic
13	Partition Coefficient	Not applicable
14	Bulk Density	Not specified
15	Tap Density	Not specified
16	Compressibility Index	Not applicable
17	Hausner's Ratio	Not applicable
18	Particle Size (PSD)	Not applicable

Nutritional composition and Health Benefits of Muskmelon



Table.2: Nutritional composition and Health Benefits of Muskmelon

Sr. No.	Nutrition	Amount
1	Energy	34 kcal
2	Water Content	89.8 g
3	Carbohydrates	8.2 g
4	Sugars	7.9 g
5	Dietary Fiber	0.9 g
6	Protein	0.8 g
7	Fat	0.2 g
8	Vitamin A (as β -Carotene)	3382 IU
9	Vitamin C	36.7 mg
10	Vitamin K	2.5 μ g
11	Vitamin B6	0.072 mg
12	Folate (Vitamin B9)	21 μ g
13	Potassium	267 mg
14	Calcium	9 mg
15	Magnesium	12 mg
16	Phosphorus	15 mg
17	Sodium	16 mg
18	Iron	0.21 mg

MATERIAL AND METHODS:**Material and it's role:****Table.3: Material and it's role**

Sr. No	Ingredient	Properties
1	Muskmelon	Coloring agent
2	Petroleum	Moisturizing agent
3	Starch powder	Binding agent
4	Zinc oxide	Improve the texture
5	Beeswax	Stabilizing agent
6	Glitter	Reflect light Shine and Bright App.

Method of preparation:

Hot air drying: Hot air drying is a common method used to dry muskmelon, preserving it for later use.

Steps Involved:

1. Pre-treatment: Muskmelon is washed, cleaned, and sliced or diced into desired shapes.
2. Pre-heating: The muskmelon pieces are pre-heated to around 60°C (140°F) to remove excess moisture.



3. Hot air drying: The pre-heated muskmelon pieces are placed in a single layer on drying trays or racks. Hot air is circulated around the muskmelon at a temperature of 60-80°C (140-176°F).
4. Drying time: The drying time varies depending on the thickness of the muskmelon slices, temperature, and air flow. Typically, it takes 6-12 hours to dry muskmelon using hot air drying.
5. Monitoring and control: The drying process is monitored to ensure the muskmelon reaches the desired level of dryness. The temperature and air flow are adjusted as needed to prevent over-drying or under-drying.
6. Packaging and storage: The dried muskmelon is packaged in airtight containers or bags to maintain freshness and stored in a cool, dry place.

Formulation table:

Table.4: Formulation Composition of Muskmelon-Based Cosmetic Product

Sr. No	Ingredient	F1	F2
1.	Muskmelon	1.5g	1.5g
2.	Coconut oil	Tentative	Tentative
3.	Starch powder	2g	2g
4.	Zinc oxide	0.25g	0.25g
5.	Beeswax	0.75g	0.75g
6.	Glitter	—	Tentative

Manufacturing Process:

1. Weigh the ingredients accurately.
2. Mix the starch powder, zinc oxide, and muskmelon extract in a bowl.
3. Add the beeswax and petroleum to the mixture.
4. Mix everything thoroughly until you get a uniform powder.
5. Sift the powder to ensure it's smooth and even.
6. Fill the 5g containers with the powder.
7. Compact the powder gently.

EVALUATION OF EYE MAKEUP PRODUCT:

1. Flow properties of powder



Fig.12: Angle of Repose

The flow properties of powder type of eye makeup products should be determined especially during filling process of loose powder to the final container or before the compression of pressed cake in case of compressed powders. Control of the powder flow and density of final product is important to achieve high quality of the finished eye makeup products. Flow properties are

measured in terms of angle of repose. Smaller the angle of repose, better will be the flow and vice versa. The angle of repose determined by fixed funnel method.

Bulk density and tapped density

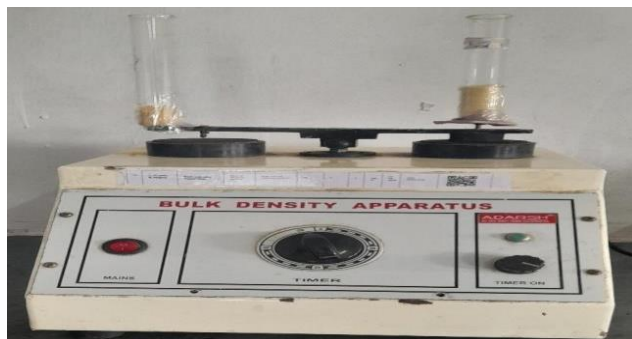


Fig.13: Bulk density apparatus

The bulk density (V_b) and tapped density (V_t) are measured for determining the trapped air in the powder and to ensure free flowability. The bulk density of a powder is the ratio of Mass of powder sample (untapped) and its total volume including void spaces/volume. It is expressed as grams per milliliter. Tapped density is obtained after tapping and is measured as the ratio of the known mass of the powder and its total volume occupied without void volume. Tapping of powder is done in an apparatus that lifts and drops the volumetric cylinder containing powder at a fixed distance. Tapped density is always higher than bulk density. Both the densities provide information about the flowability of the powders.

Compressibility of powder mixtures

Percent compressibility (Carr's index) and Hausner's ratio is calculated using bulk and tapped densities. Inter-particle interactions significantly influence the powder flow, which are based on these parameters (formula given below). Lower the values of compressibility index and Hausner's ratio, better will be the flow. These interactions are less significant in free-flowing

powder samples, and both the densities will be closer in values. Greater inter-particle interactions are there in poor flowing powder samples, and a more difference will be observed between bulk and tapped density determined by powder pile method.

$$\text{Compressibility Index} = 100 \times \left(\frac{\rho_{\text{tapped}} - \rho_{\text{bulk}}}{\rho_{\text{tapped}}} \right)$$

$$\text{Hausner Ratio} = \left(\frac{\rho_{\text{tapped}}}{\rho_{\text{bulk}}} \right)$$

Skin irritation test

Apply the eyeshadow on the skin for 10 min & observe



Fig.14: Skin irritation test

PH parameter

Determine the PH of the eyeshadow using PH Paper (5-7)

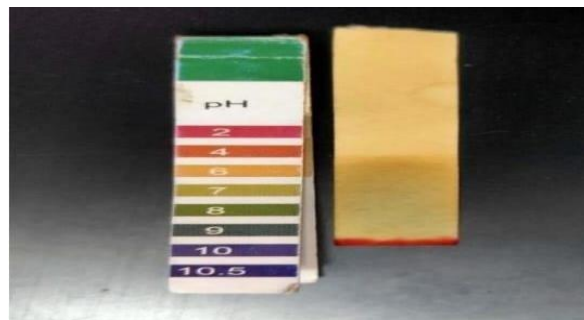


Fig.15: PH test

Water resistance

The water-resistant or waterproof properties of mascaras, eyeliners or eyeshadows can be evaluated by applying a known concentration of the eye makeup product on the backside of the hand and is allowed to set for a minute. The hand is then immersed into water or hold it under

running water again for a minute. Remaining amount left on the hand after removing the eye makeup product by/under water, is analyzed visually or using a soft ware made for such analysis.

RESULT AND DISCUSSION:

Table.5: Product Evaluation Summary

Sr. No	Evaluation parameter	Inference
1	Color	Grey and Cream
2	PH	6-7
3	Flow properties of powder	Good (1.29)
4	Bluk density and tapped density	Good (21-23)
5	Compressibility of powder mixtures	Good (7.15)
6	PH parameter	6-7
7	Water resistance	Water resistance
8	Coloring uniformity	Uniform color
9	Force of application	Good



In last few decades there has been tremendous boost in use of cosmetics by women. However, the hazards cause by these chemicals has come into limelight very recently. The present work formulation and evaluation of herbal Eyeshadow was aimed to formulate a Eyeshadow using herbal ingredients with a hope to minimize the side effect as produced by the available synthetic ones.

Hence, from present investigation it was concluded that this formulated herbal Eyeshadow has better option to women with Eyeshadow has better option to women with minimal side effect through a detailed clinical trials may be done to access the formulation for better efficacy.

SUMMARY AND CONCLUSION:



The study focuses on the development of a herbal eyeshadow utilizing natural coloring agents derived from muskmelon (*Cucumis melo* L.), aiming to provide a safer, non-toxic alternative to synthetic cosmetic products. The pulp and peel of muskmelon were processed to extract natural pigments using ethanol and aqueous solvents. These extracts were incorporated into a base composed of natural excipients like starch powder, coconut oil, and zinc oxide to form eyeshadow formulations. Various batches were prepared and subjected to evaluation parameters including flow property, bulk and tapped density, Compressibility, skin irritations, PH parameter under different conditions. Phytochemical screening confirmed the presence of flavonoids and carotenoids, contributing to both coloration and antioxidant properties. The formulation demonstrated satisfactory cosmetic attributes, good skin compatibility, and no adverse reactions, indicating its potential as a safe and effective herbal cosmetic product.

REFERENCES

1. International Journal of Advanced Research in Science, Communication and Technology (IJARSCT). Int J Adv Res Sci Commun Technol. 2023 Dec;3(2). ISSN (Online): 2581-9429. Impact Factor: 7.301.
2. Srinivas M, Supriya D, Singh A. Current review on herbal face care. Int J Pharm Sci Rev Res. 2021 Mar-Apr;67(2):101-7.
3. Rathod SA, Bhandare GN. Formulation and evaluation of homemade herbal eyeshadow from natural coloring matter (beetroot). Int J Novel Res Dev. 2022 Sep;7(9).
4. Butler H. Poucher's perfumes, cosmetics and soaps: makeup of makeup – decoding eye shadow. Klu Academic Publishers.
5. Lucas A. Cosmetics, perfumes and incense in ancient Egypt. J Egypt Archaeol. 1930;16:41–53. Doi:10.1177/030751333001600112.
6. A handbook of cosmetics by B.M.Mithal M. Pharm , PH D (Professor of pharmacy and deputy director) And colour pigments of Beta Vulgaris Taproot (Swetha krutika) , S Sairam, Sheik Azhar.
7. Venkateswarlu, K., Devann, N., Priya, R. V., & Kumar, P. B. R. Musk Melon: Minerals, Nutritional Values. Pharmatutor journal.
8. Soe, D. H. H., Toungoo, M., & Myint, D. Z. M.(2011). Investigation and Chemical Constituents of Muskmelons.[Web Source]
9. Bhatia, S., & Kaushik, D. (2019). Herbal cosmetics: A safe and effective approach. Journal of Pharmacognosy and Phytochemistry, 8(3), 1162–1169.
10. Sharma, H., & Kapoor, V. (2018). Natural colorants in cosmetics: A review. International Journal of Pharmaceutical Sciences and Research, 9(12), 5119–5125. [https://doi.org/10.13040/IJPSR.0975-8232.9\(12\).5119-25](https://doi.org/10.13040/IJPSR.0975-8232.9(12).5119-25)
11. Mishra, A. K., Mishra, A., & Chattopadhyay, P. (2011). Herbal cosmeceuticals for skin protection. Natural Product Radiance, 10(3), 277–286.
12. Singh, R., & Kumar, R. (2020). Muskmelon (*Cucumis melo*): A therapeutic and nutritional overview. International Journal of Current Pharmaceutical Review and Research, 11(2), 5–12.
13. Dhiman, N., & Goel, A. (2015). Evaluation of herbal cosmetic preparation using beetroot extract for its coloring properties. Journal of Drug Delivery and Therapeutics, 5(3), 54–57.
14. Kaur, A., & Agrawal, S. (2018). Formulation and evaluation of herbal eye cosmetic using natural pigments. International Journal of Green Pharmacy, 12(2), 87–91.
15. Kapoor, V. P. (2017). Natural dyes and their applications in cosmetics. Indian Journal of



- Natural Products and Resources, 8(4), 267–275.
16. Kaul R, Mehta S, Verma A. Herbal cosmetics: an emerging trend. *J Nat Cosmet Res.* 2021;5(1):10–16.
 17. Dureja H, Kaushik D, Gupta M, Kumar V, Lather V. Herbal eyeshadows: a safer alternative to synthetic formulations. *Int J Cosmet Sci.* 2020;42(3):230–6.
 18. Sharma P, Gupta R, Mishra A. Natural colorants in herbal cosmetics: a comprehensive review. *Int J Herb Med.* 2019;7(4):45.
 19. Bhat ZA, Rather MA, Dar BN. Phytopigments in muskmelon (*Cucumis melo*): color, stability, and cosmetic relevance. *J Plant Biochem Biotechnol.* 2022;31(1):88–94.
 20. Patil SM, Deshmukh RK, Pawar VD. Extraction of natural colorants from fruits: focus on muskmelon carotenoids. *J Nat Prod Res.* 2021;25(2):112–9.
 21. Benzie IFF, Wachtel-Galor S. Herbal medicine: biomolecular and clinical aspects. 2nd ed. Boca Raton (FL): CRC Press; 2011.
 22. Dureja H, Kaushik D, Gupta M. Cosmeceuticals: An emerging concept. *Indian J Pharmacol.* 2005;37(3):155.
 23. Goyal RK. Practical handbook of herbal formulations. New Delhi: CBS Publishers; 2010.
 24. Kaur CD, Saraf S. In vitro sun protection factor determination of herbal oils used in cosmetics. *Pharmacogn Res.* 2009;1(1):22.
 25. Cosmetic Ingredient Review (CIR) Panel. CIR Safety Assessments. [Internet]. Washington (DC): CIR; [cited 2025 Apr 23].
 26. Dureja H, Kaushik D, Gupta M. Cosmeceuticals: An emerging concept. *Indian J Pharmacol.* 2005;37(3):155–9.
 27. Kaur IP, Agrawal R. Herbal cosmetics: The way forward. *Int J Pharm Pharm Sci.* 2007;1(1):2–8.
 28. Kumar A, Singh J, Singh H. Phytochemical and pharmacological properties of *Cucumis melo*: An overview. *Int J Pharm Sci Res.* 2012;3(4):1110–5.
 29. Katiyar C, Gupta A, Kanjilal S, Katiyar S. Drug discovery from plant sources: An integrated approach. *Ayurveda J.* 2011;32(1):10–8.
 30. Patel N, Patel R, Patel M. Formulation and evaluation of herbal cosmetic product. *Int J Pharm Res Bio-Sci.* 2016;5(1):1–9.
 31. Anitha J, Muthusamy S, Devi GK. Formulation and evaluation of herbal eye shadow. *World J Pharm Res.* 2017;6(4):1343–50.
 32. Patel K, Shah A, Mehta T. Formulation and evaluation of herbal eyeshadow using natural coloring matter from muskmelon (*Cucumis melo* L.). *Int J Herb Med.* 2023;11(2):45-50.

HOW TO CITE: Rugvedi Hiwase*, Vaishnavi Bhatkar, Roshani Garkal, Pooja Bekate, Swati Deshmukh, Formulation And Evaluation of HERBALn Eyeshadow from Natural Coloring Matter (MUSKMELON), *Int. J. of Pharm. Sci.*, 2025, Vol 3, Issue 5, 1923-1932. <https://doi.org/10.5281/zenodo.15387987>

