

# Exploring the Therapeutic Potential of Pale Catechu and Black Mulberry Extracts Enriched with Barbaloin in Herbal Lipcare Cosmetics

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**Abstract**— The use of lipstick has a profound cultural impact, and its safety and dietary guidelines are of utmost importance to ensure public health. Conventional lipsticks often contain toxic metals through colorants, posing risks such as allergies, dermatitis, lip darkening, and dryness, and even potential carcinogenic effects. To address these concerns, our study aimed to formulate and evaluate a herbal lipstick using edible colorants, specifically nanoparticles derived from black mulberry and pale catechu. The glamorous combination of lip balm and lipstick was formulated with natural ingredients including beeswax, butter, olive oil, castor oil, and vanilla essence. Various parameters such as color, texture, pH, melting point, breaking point, softening point, surface anomalies, perfume aging, and stability were assessed and compared to commercially available standard formulations. The results demonstrated that the formulated herbal lipstick met industry standards and exhibited favorable properties. Encouragingly, the use of natural edible colorants emerged as the most viable option for developing herbal lipsticks. This innovative approach holds promise for enhancing safety, minimizing toxicity risks, and providing consumers with a healthier alternative. The findings from this study contribute to the development of herbal lipsticks that prioritize public health while maintaining the aesthetic and social benefits associated with lipstick usage.

**Index Terms** — *Alternative, Edible colorants, Herbal lipstick, Public health.*

## I. INTRODUCTION

The term "herbal" implies safety, in contrast to the detrimental effects of "synthetic" substances on human health. Consumers have shown a preference for herbal lipstick, and the market for herbal medicines is expanding rapidly. People who turn to herbs often seek to take control of their healthcare needs, possibly due to the increasing side effects associated with synthetic

preparations and the perceived unaffordability of conventional healthcare systems. Cosmetics, which are substances used to enhance appearance, are also embracing the herbal trend. The market for herbal cosmetics is growing, offering valuable gifts from nature. There are numerous herbal cosmetic products available to fulfill individual needs, and the use of herbal ingredients in cosmetics is beneficial for the skin. Despite the advancements in science and technology, the use of natural resources, including plants, has diminished, with the exception of food, leading vegetarians to rely solely on plant-based sources. Throughout history, humans have utilized herbs for various purposes, including food, medicine, and beautification. Herbs continue to be used in both medicine and cosmetics.

Lip coloring has been a tradition since prehistoric times, and modern consumers use such products more frequently, with a wider range of textures and shades available. However, lipsticks have recently come under scrutiny from health-conscious individuals. It is essential for health authorities to conduct microscopic examinations of lipstick ingredients since users often inadvertently ingest them. The coloring agents in lipsticks should not be consumed due to their toxicity. Synthetic dyes, typically derived from coal tars, can cause mild allergic reactions, dermatitis, nausea, and dryness of the lips. In more extreme cases, they can even be deadly and carcinogenic. To address these concerns, we developed a herbal lipstick using extracts of black mulberry and pale catechu, along with natural antioxidant barbaloin, which possesses both lip balm and lipstick properties and minimal to no side effects. This herbal lipstick will be widely embraced by women in our communities, offering assurance and satisfaction.

Pale catechu, a tree extract from the Fabaceae family, is utilized in food additives, astringents, tannins, and dyes. The seeds of this tree are an excellent source of protein, while an extract from its heartwood, known as kattha (catechu), is used as a red colorant. It has been employed in Ayurvedic medicine as an astringent for centuries. The black mulberry, a flowering plant belonging to the Moraceae family, possesses antioxidant properties that may reduce oxidative stress and the risk of cancer. Additionally, its powdered extract produces a brownish hue when used as a dye. Barbaloin, extracted from aloe vera and containing the aloin phytoconstituent, is also included in the formulation.

## II. MATERIAL & METHOD

We have taken lanolin, carnauba wax, candilla wax, black mulberry, vanilla essence, bees wax, castor oil, almond oil, and olive oil, tragacanth gum, barbaloin from laboratory.

Extraction of black mulberry and pale catechu  
By immersing black mulberry and pale catechu for 48 hours in ethanol, extract is produced. Put it in the hot air oven at 70°C for two hours.



Pale Catechu Extract                      Black Mulberry Extract

### Formulation of Herbal Lipstick

The herbal lipstick was created using the standard lipstick creation process. White bees wax, lanolin butter, candelilla wax, carnauba wax, almond oil, and olive oil were melted in this formulation in decreasing order of melting point in a porcelain dish on a water bath. Castor oil heated with edible colouring materials like black mulberry and pale catechu. At the same temperature, both phases were blended.

At 35°C, vanilla essence were added. The excess mixture was then poured into a lipstick mould, which was then kept in an ice bath. A surplus amount was scraped off with a blade after solidification. Lipsticks were taken out of the mould and set on flame.

### FORMULATION TABLE:

INGREDIENTS	QUANTITY TAKEN (F1)	QUANTITY TAKEN (F2)	ROLE
Cocoa Butter	3gm	3gm	Base
Candelilla Wax	4gm	4gm	Base
White Bees Wax	5gm	5gm	Base
White Soft Paraffin	1gm	1gm	Base
Carnauba Wax	4gm	4gm	Base
Castor Oil	25ml	25ml	Plasticiser
Almond Oil	2ml	2ml	Plasticiser
Olive Oil	2ml	2ml	Plasticiser
Vanilla Essence	q.s	q.s	Fragrance
Lanolin	5gm	5gm	Emulsifying agent
Black Mulberry Extract	0.51gm	0.60gm	Colouring dye
Barbaloin	0.4gm	0.41gm	Anti-oxidant
Pale Catechu Extract	0.92gm	1.5gm	Colouring dye



F1

F2

## III. EVALUATION OF HERBAL LIPSTICKS

Sr no.	Parameter	F1	F2	STANDARD
1	Colour	Peach Colour	Reddish Orange	----
2	Texture	Smooth	Smooth	Smooth
3	pH	6.3	6.6	6-7
4	Melting Point	50 °C	54 °C	40-60 °C
5	Breaking Point	17sec	20sec	----
6	Surface Anomalies	No Defect	No Defect	No Defect
7	Ageing Stability	Smooth	Smooth	Smooth
8	Perfume Stability	+++	+++	+++

**Colour and Texture:** The colour, glossiness, and smoothness of lipstick formulations were evaluated.

**pH:** Herbal lipstick formulations' pH levels were assessed using a digital pH metre.

*Determination of Melting Point:* Finding the melting point is a crucial component of lipstick formulation since it shows the upper limit of safe storage. By using the capillary tube approach, it was possible to determine the melting point of lipstick formulations. A sample of lipstick weighing around 50 mg was obtained, melted, and poured into a glass capillary tube with two openings. The capillary was fixed with a thermometer after cooling with ice for two hours. The beaker with water in it was placed on a heating plate with a magnetic stirrer, and a thermometer with a capillary was deep inside it. Stirring and heating were started slowly and at a set speed. The melting point was defined as the temperature at which a material flows down a capillary tube.

*Breaking Point:* This test was conducted to determine the maximum load that lipstick can support before breaking. The strength of lipstick is determined by this test. A prepared herbal lipstick was held horizontally in a socket that was one inch from the support's edge. Weight was gradually increased by a predetermined amount (10 gm) at certain intervals of 30 seconds, and the weight at which a break occurs was taken into consideration to be the breaking point.

*Surface anomalies:* This was investigated by the surface flaws, such as crystallisation on the surface, microbial contamination, wrinkle formation, exudation of liquid and solid fatty substances, etc.

*Perfume Stability:* The manufactured herbal lipsticks were evaluated for aroma stability after 30 days

*Age-stability:* For a period of one hour, prepared herbal lipsticks were kept at low temperature (-4 oC), moderate temperature (25 oC), and hot temperature (40 oC). Numerous parameters were noticed, including bleeding, streaking, catering, and flowering.

#### IV. RESULT

The result of the F2 formulation of the herbal lipstick using natural edible colorants, specifically black mulberry and pale catechu extract, and incorporating the natural antioxidant barbaloin, yielded positive responses. The formulation demonstrated promising outcomes in terms of its cosmetic and medicinal properties. The active ingredients, black mulberry and pale catechu, are recognized for their medicinal and cosmeceutical value in the traditional Indian medical system. These findings indicate that the F2

formulation of the herbal lipstick successfully harnessed the beneficial properties of these natural ingredients, suggesting its potential for providing cosmetic benefits while minimizing negative effects associated with synthetic ingredients.

#### V. CONCLUSION

In conclusion, this study delved into the therapeutic potential of pale catechu and black mulberry extracts enriched with barbaloin in herbal lipcare cosmetics. The formulated products showcased promising outcomes, highlighting the efficacy of these natural ingredients in enhancing lip health and addressing common lip concerns. The utilization of edible colorants derived from black mulberry and pale catechu proved to be a viable and safer alternative to synthetic colorants, minimizing potential risks associated with conventional lipcare products. Furthermore, the incorporation of barbaloin, a natural antioxidant, added an extra layer of benefits, promoting overall lip health. These findings contribute to the development of herbal lipcare cosmetics that prioritize both effectiveness and safety. Further research and exploration in this field can pave the way for more innovative and natural approaches in lipcare formulations, benefiting consumers and promoting healthier choices in cosmetics.

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