e-ISSN: 2349-2678, p-ISSN:2961-6050

available online on www.ijpba.in

International Journal of Pharmaceutical and Biological Science Archive

NLM (National Library of Medicine ID: 101732687)

Index Copernicus Value 2019: 71.05

Volume 11 Issue 4; July-August; 2023; Page No. 71-77

Review Article

Approaches to Minimize the Defects in Lipstick Formulations

Vigneshwaran L.V[*1], Khaseera Farsana[1], Khairunnisa T[1], Amritha P.P[1], V. Sebastin[1], AjithBabu T.K[1]

[1]Malik Deenar College of Pharmacy. Kasaragod, Kerala, India

Received: 02-04-2023 / Revised: 30-05-2023 / Accepted: 24-06-2023

Corresponding author: Vigneshwaran L.V

Conflict of interest: Nil

Abstract

Lipstickisacosmeticproductcontainingpigments,oils,fragrance,preservatives,colors,textureandprotection to the lips. This review paper is about the overview on herbal lipstick which includes advantages, ideal characters, defect in lipstick, approaches to minimize defect in lipstick formulation and evaluation. Lipsticks are gaining popularity because natural cosmetics are safe. It is easy to use and handle by women. The herbal lipstick having natural ingredients or nutrients it is safe to use that keep lips healthy. This review mainly focuses on defects in lipstick, approaches to minimize defect in lipstick formulation and evaluation of lipstick. There is no any side effect in herbal lipstick that's why we are doing herbal lipstick. Also doing the evaluations parameters like melting point, breaking point, softening point, surface anomalies, ageing stability, force of application, test for spreadability, solubility test, thixotrophy character, and perfume stability.

Key words: Lipstick, Defects in lipstick, Wax crystallization, Evaluation

Introduction

Cosmetics are the substances to enhance or protect the beauty of the human body dates back to Vedic and puranic period. Earlier human race of tribal era used animal parts, vegetable leaves, flowers, color stones, shells, etc.to adorn their bodies. As per FD&C Act cosmetics are defined as "articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body for cleansing, beautifying, promoting attractiveness, or altering the appearance." Cosmetic include skin care, creams, lotions, powders, perfumes, lipsticks, finger nail polishes, eye and facial makeup, hair colors, deodorants, baby products, bath oils, and many other types of products. It does not include soap.

Cosmeceuticals are cosmetic pharmaceutical products intended to improve the health and beauty of the skin by improve the health and beauty of the skin by providing a specific result, ranging from acne-control and anti-wrinkle effects, to sun protection. The concept discovered by Dr. Albert Klingman states that the Cosmeceuticals are topical agents that are distributed across broad spectrum of materials, laying somewhere between pure cosmetics (lipstick and rouge) and pure drug (antibiotics, corticosteroids). Cosmeceuticals, are the combination of biologically active ingredients which have medicinal or drug-like benefits and cosmetics which helps for beautification of the skin. COSMETIC have become an integral part of every woman`s life. Herbal cosmetics are products which are formulated using various permissible cosmetic ingredients in which one or more herbal ingredients are used to provide distinct cosmetic benefits. They are also called as herbal

cosmetics. Herbal cosmetics are the latest trend in the filed of beauty and fashion. The herbal cosmetics industry is experiencing a rising graph for its market and products which are being sold the world over. [1]

Lip problems include lip dryness, cracking, pain, numbness, sores and swelling. There are many causes of lip symptoms; they range from mild to serious. The duration and course of lip symptoms vary widely, depending on the cause. Lip Problems occurs as a result of injury, such as biting lips, burning them with hot food. Even a common infection can cause lip symptoms. Diseases or conditions that affect the nerves and muscles, including nervedamageorneuropathy,canbeassociatedwithsymptomsthat-involvethelips.Lipsymptoms may also be the result of cold and dry weather, infection, nutritional deficiencies, or medication side effects. Suitable drug candidates for medicated lipsticks are locally acting on the lips, soothing, anti-irritant agent, skin protectant, keratolytic agent, steroids, antibiotics, and anti-inflammatoryagent.it can be overcome by various method.

Lipsticks are one of the most widely used cosmetic products. Social, psychological, and therapeutic benefits can be attained from using lipstick. The beauty and attractiveness of a person are enhanced as However, current lip care products not only emphasize aesthetic value but also preferably have added medicinal value to the lip of consumers. This led to the emergence in the market of medicated lipsticks with active medicinal ingredients. The medicated lipsticks may provide protection against infections of bacteria due to the presence of an active medicinal ingredient in the formulation. This function adds on to the existing role of lipsticks, which provide moisture and emollient action to prevent cracking and chapping of the lips. [2]

Lipstick is a cosmetic product containing pigments, oils, waxes, and emollients that applies color and texture to the lips. It is most widely used cosmetic item by the women to give an attractive color and appearance to the lips. There are many varieties of lipstick. Lippy is a common British word for lipstick. These are usually manufactured as molded sticks and consists of coloring pigment dissolved in fatty base containing wax. [3]

Characteristics of Ideal Lipsticks:

Specifications of lipsticks long-lasting impact should adequately cover the lips. Make lips soft must stick to lips firmly without becoming crumbly or tacky. High standard of quality. Absolutely grittiness-free without drying. Not irritating to the lip's skin. Pleasant level of flexibility. Having no sweat shiny and uniform appearance. Simple to apply and remove both chemically and physically stable. Should have high retention of colors intensity without any change in shades. Should have pleasant odor & flavor.[4]

Advantages of Herbal Lipstick Over

Synthetic Lipsticks

The natural and safe component is found in the organic lipstick. Additionally, they contain natural nutrients that support healthy lips. They have minimal or no impact on any aspect. They are used to treat leucoderma of the lips and are non-toxic, highly lipophilic, anti-oxidants, antimicrobial, and anti-inflammatory. A wide variety of colours from which to pick. Purplish red, ruby red, beetroot purple, dark violet, pastel red, pale red, purplish red, rose red, deep magenta, dark purple, orange, and deep violet are only a few of the original colour shades that colourants come in. These colours can be combined and blended in many ways to produce various tones. The colour of something can be changed to different colours by adding organic and inorganic acids and bases.[5]

Defects in Lipsticks[6]

FORMULATION RELATED PROBLEMS

Sweating: It is the most common problem of lipstick formulation due to high oil content or inferior oil binding. It may arise in any climate or temperature range.

Streaking: A thin line or band of a different colour or a substance appears on the finished product.

Bleeding: This refers to the separation of colored liquids from the waxy base.

MOULDING RELATED PROBLEMS

Laddering: Lipstick does not look smooth or homogeneous after congealing and setting but instead has a multi-layered appearance.

Deformation: This is a moulding problem where the shape of the lipstick looks deformed. It is noticeable and appears on both sides of the lipstick.

Cratering: This appears in split moulding and it shows up flaming when the stick develops dimples.

Mushy failure: This is a problem in which the central core of the lipstick lacks structure and breaks.

Lipstick Sweating:

To better understand the problem of lipstick sweating first we need to consider the structure of the waxes and the dependence between waxes and oils. During lipstick formulation development we create a new wax structure with trapped emollients inside.1 Once the wax is moulded a matrix is formed, letting the oils move freely within the stick. The issue of sweating occurs when the size of this matrix is too small, not allowing the oils to move freely. Increased temperature causes the wax matrix to modify and the oil/wax equilibrium to be altered, causing the oil to migrate to the surface of the stick. Emollients make up roughly 70% to 85% of an average formulation's components. Syneresis is seen when the oils inside the wax matrix do not adhere effectively. During little temperature changes or while the stick is being stored, tiny oil droplets develop on its surface. The solution to this issue lies in the wax structure and the compatibility of the oils and waxes. Another crucial element is the polarity of the oils and waxes, which should be as comparable as feasible. If not, co-emulsifiers like polyethylene glycols must be included to stabilise the formulation. The problem might be solved by esters with a low HLB value, such as polyglyceryl-3 diisostearate.

Because the bonding power between the wax and oil weakens when pigment is added to a wax and oil mixture, perspiration is increased.

Heavy branched chain waxes, such as C18-36 triglyceride, are required to be included to the formula in order to minimize syneresis since they sterically inhibit the numerous straight chain waxes. Changing the ratio of waxes to oils can be the best answer in some situations. In real life, sweating is postponed and wax structure is

increased when wax content is increased. Sweating can be avoided by replacing low viscosity oils with viscous, thicker emollients.

Colour Fading:

The choice of the right pigment and its composition is a significant element in colour fading. Excessive raising of the pigment content may emasculate the formulation and may have affect on stability. We have a choice between organic colours like D&C Red No 7 Ca and inorganic pigments like iron oxides and titanium dioxides. If we check the compatibility between the pigment solvent and the remainder of the formulation, adding pigments to pastes (pigment dispersions, for example, in Riccinuscommunis oil) can be extremely simple.To make the production process as simple and inexpensive as feasible if we use powder pigments, we need take into account a pre-dispersion step.

Pigments are typically dispersed in a liquid media in two phases. Milling the dispersion to break up any agglomerates and wetting the surface of the primary particles and agglomerates. Oils' capacity to wet pigments needs to be defined right away. Pentaerythrityltetraisostearate and polyester-4.2 are well-known pigment wetting agents. As an alternative to Riccinuscommunis oil, hydrogenated castor oil can also be used. We can always add extra chemicals that lower the mixture's surface tension for improved consistency with the other formulation ingredients.

The formulation's photo stability is impacted by the proper pigment selection. Incorporating a UV filter like ethylhexylmethoxycinnamate is the simplest technique to prevent colour bleaching. When using an oil of natural origin, it is required to use an antioxidant, such as tocopherol or a combination of it with ascorbylpalmitate.

Another component that shields the formulation against oxidation and colour fading is also a possibility. Diethylhexylsyringylidenemalonate (and) caprylic/capric triglyceride are two well-known ingredients with this action.

A little amount of a film-forming substance, such as PVP/eicosene copolymer, would also favourably affect colour fading resistance.

Wax Crystallisation:

The specific chemicals each play a role in how the lipstick crystallises. Wax in the lipstick recipe was most frequently found in crystallisations; active chemicals or preservatives were less frequently found. Pre-dispersion in the right solubilizer is a straightforward method to prevent the crystallisation of an active component or preservative.

When picking a cosmetic product, clients often base their decision on the components and raw materials used in the formulation. Ingredients from nature are preferred. Unfortunately, natural waxes typically have an unstable structure. Beeswax, candelilla wax, and carnauba waxes can all crystallise when combined in certain ways. This group also includes microcrystalline wax.

When incompatible substances are found, this problem most commonly arises. The ideal approach is to pick substances with comparable polarities. Unsaturated fatty acids in formulations with a double bond may cause a reaction that results in tiny crystal formations on the surface of the lipstick. Reducing the amount of wax and replacing it with a gelling agent, such as glycerylbehenate/elcosadioate, or a rheology modifier, such as silica or trihydroxystearin, alters the system's thixotropy and ensures a sturdy structure and stable stick. Lanolin and other paste-like ingredients can also shield the formulation.

Wax crystallisation reveals temperature variations, particularly in tests conducted at lower temperatures and in ambient temperatures over time.

The production procedure is another factor contributing to this issue. There may be an unfavourable outcome if the cooling process is too quick for the bulk production or the mould is too cold during the filling process. When the lipstick is cooled gradually, it crystallises less than it would under normal production conditions. All these issues can occasionally be resolved by altering the production trial's description.[7]

The Problem

The waxes must be melted over extended periods of time; solid bits may need to be broken up before being introduced to the kettle. Because of the vastly different viscosities, it is difficult to disperse pigment grinds and pre-dispersions into the oil/wax media.To achieve the requisite consistency and homogeneity, the finished product may need to go through a mill.

The Solution

By preparing the premix with a Silverson High Shear Batch mixer, processing times can be significantly shortened while product quality and uniformity are increased. Additionally, it may lessen or even eliminate the need for conventional milling. The following is how the rotor/stator mixer works:

Stage 1:

Weighing and heating the oils and waxes in the kettle. When the product has partially liquefied, the mixer is turned on. The tremendous suction produced by the rotor's rapid spin pulls the wax particles and other components into the work head.

Stage 2:

The liquid and solid ingredients are propelled to the outer edges of the work head by centrifugal force, where they are subjected to high shear in the space between the rotor blade tips and the inner wall of the stator. The result is subsequently pushed back into the mixture through the stator.

Stage 3:

The vessel's contents repeatedly pass through the work head. Heat, aggressive mixing, and particle size reduction work together to quickly dissolve the pigment powder into the oil/wax medium and melt the wax, resulting in a homogeneous final product. [8]

Quality Control of Lipsticks

Quality assurance Since the product must adhere to Food and Drug Administration (FDA) standards, procedures are stringent. Due to the rigorous regulations placed on the production process and materials, lipstick is the only cosmetic that is consumed. In order to ensure that lipstick is contamination-free, it is combined and processed in a controlled setting. Colorimetric technology is used to numerically control the colours of lipstick. When blended, this apparatus provides a numerical reading of the colour so that it can perfectly match the remaining lipsticks.

The heat test and the rupture test are two additional testing for lipstick. The lipstick is placed in the extended position in a holder and kept at a constant temperature over an oven 1F (540 °C) for 24 hours to conduct the heat test. The lipstick shouldn't droop or be distorted in any way. The lipstick is positioned in two holders that are expanded during the Rupture test. At intervals of 30 seconds, weight is gradually added to the holder on the lipstick portion until the lipstick ruptures.

The manufacturer's standards are then compared to the pressure needed to rupture the lipstick. Each producer establishes its own Parameters because there are no industry standards for these tests.[9]

Evaluation of herbal lipstick

FORCEOFAPPLICATION:

It is for comparing the force that will be applied during application. Lipstick was placed at a 45-degree angle to a 1-inch square area on a piece of coarse brown paper that was kept on shadow graph balance. The pressure reading serves as a gauge for application force.

AGEING STABILITY:

In this experiment, produced lipstick was kept for one hour at three different temperatures: 4°C in the refrigerator, 20–25°C at room temperature, and 30–40°C at high. Several criteria, including bleeding, streaking, catering, and blooming, were seen after an hour.

TEST FOR SPREADABILITY:
To check whether lipstick consistency will spread on a surface, a spreadability test is conducted. This test was done in two earlier investigations where a lipstick was placed to paper or a glass slide for at least three centimetres. The creation of a protective layer made of lipstick was then visually assessed for smoothness and homogeneity. The lipstick was also assessed according to the following criteria:.
Excellent (E): No fragments; consistent, smooth application without lipstick distortion.
Intermediate (I): Minimal lipstick deformation, homogeneous application, and few fragments.
Unsatisfactory (U): Many pieces, uneven application, and severe lipstick deformation.

SURFACEANOMALIES:[10]
The creation of crystals on surfaces, microbial contamination, wrinkle formation, exudation of liquid and solid fatty substances, and other surface flaws were investigated.

PERFUME STABILITY:[12]
The herbal lipstick formulation underwent a 30-day fragrance test to determine its scent stability.

THIXOTROPHY CHARACTER: [11]
It serves as a thixotropic quality indicator and was performed with a penetrometer. Under a 50gm force at 25°C, a standard needle of a particular diameter was allowed to pierce for 5 seconds. The thixotropic structure of lipstick was measured by the depth of penetration.

SOLUBILITY TEST:
To describe the solvent selectivity of a component in lipsticks, solubility experiments might hint about the polarity of the substance. According to Maru and Lahoti's (2018) approach, solubility was measured by introducing a few drops of lipstick sample to methanol, ethanol, chloroform, and petroleum ether in various test tubes. Several research also employed this methodology. Both ethanol and chloroform made the lipstick soluble. Due to the hydroxyl group of ricinoleic acid, castor oil-based lipstick has a limited solubility in petroleum solvents but is soluble in alcohol. The significance of a lipstick formulation's solubility, however, has not been the subject of any study articles.

SOFTENING POINT:
Lipstick should be able to survive a variety of situations that it will encounter while being carried around in a consumer's handbag. It need to be equally simple to apply in hot and cold weather and resistant to a range of temperature conditions. The Ring and Ball method was used to determine the lipstick's softening point.

Conclusion

The study found that natural elements such white bees wax, butter, castor oil, coconut oil, olive oil, vanilla & rose essence, papaya extract, and lemon can be used to successfully manufacture herbal lipstick. Additionally, it has been determined that using natural colourants in lipstick composition has very little to no negative effects. After extensive clinical trials, the produced lipstick can therefore be used safely and effectively.

An herbal lipstick is applied to rehydrate the lips' muscles, preserve the skin's elasticity, sweep away stuck-on dirt, and enhance blood flow. Herbal-based cosmetics have the advantage of being nontoxic.

It nourishes the skin on the lips. This lipstick gives the lips the necessary nutrition. It aids in removing wrinkles, cracking, dryness, and lip folds. Lipstick has a calming, soothing, and cooling impact on the lips while exfoliating very little. They do so in the quickest possible time to restore the lip's natural sheen. Utilising natural lips frequently enhances their attractive colour and structure. The lip is negatively impacted by pollution and severe temperatures, but these effects can be lessened by regularly wearing herbal lipstick. They aid in maintaining the suppleness of lip cells, preventing early lip ageing.

Using your natural lips, you may easily reduce wrinkles and fine lines. We discovered the herbal lipstick to have outstanding characteristics in this study, but more research is required to determine its full potential as a cosmetic. Natural medicines are becoming widely recognised because they are less likely to have negative effects than solutions made of chemicals and are safer. Large quantities of herbal formulations are needed to meet the demands of the expanding global market. The formulation of the herbal lipstick with various natural nutrients is a successful attempt.

Reference

1. Kolekar M, Sandipan A, Pharma HLDM. “Formulation and evaluation of herbal lipstick[Internet]:Ijcrt.org;2023.
2. Mawazi SM, Azreen Redzal NAB, Othman N, Alolayan SO. Lipsticks history, formulations, and production: A narrative review: Cosmetics [Internet];2022 9(1):25.
3. Bornare A, Tribhuwan T, Magare S, Shinde A, Tarkase S. Formulation and evaluation of herbal lipstick [Internet]: Ijcrt.org;2022
4. Uzma S, Shayesta K, Sameeh A, Juveriya M, Shahidulla SM. Herbal lipstick – an updated overview [Internet]: Ijcrt.org;2023
5. Herbal Cosmetics and Ayurvedic Medicines, National institute of Industrial Research
6. Chattopadhyay PK. (2005). Herbal Cosmetics and Ayurvedic Medicines, National institute of Industrial Research. 2005; 1 st ed.: pp. 45-50.
7. Chatterjee A, Gupta MM, Srivastava B. Spherical crystallization: A technique use to reform solubility and flow property of active pharmaceutical ingredients:Int J Pharm Investig [Internet]; 2017;7 (1):4–9.
8. https://www.researchgate.net/profile/Anilkumar-Vadaga/publication/356493114_A_Review_on_Herbal_lipsticks/links/619df40dd7d1af224b20cf4e/A-Review-on-Herbal-lipsticks.pdf.2023
9. https://www.researchgate.net/profile/Anilkumar Vadaga/publication/356493114_A_Review_on_Herbal_lipsticks/links/619df40dd7d1af224b20cf4e/A-Review-on-Herbal-lipsticks.pdf.2023
10. Kolekar M, Sandipan A, Pharma HLDM. “formulation and evaluation of herbal lipstick” [Internet]: Ijcrt.org;2023.
11. Chatterjee A, Gupta MM, Srivastava B. Spherical crystallization: A technique use to reform solubility and flow property of active pharmaceutical ingredients: Int J Pharm Investig [Internet];2017;7 (1):4–9.
12. Bornare A, Tribhuwan T, Magare S, Shinde A, Tarkase S. Formulation and evaluation of herbal lipstick [Internet]: Ijcrt.org;2022
13. Mawazi SM, Azreen Redzal NAB, Othman N, Alolayan SO. Lipsticks history, formulations, and production: A narrative review. Cosmetics [Internet]. 2022;9(1):25.