



INTRODUCTION TO NATURAL COLOURANTS USED IN HERBAL LIPSTICKS

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ABSTRACT

The cosmetic used to colourize the lips is lipstick. It improves the lips' visual appeal. Lipstick is intended to protect the lips from many forms of harmful UV rays, enhance beauty, and make them appear more attractive. In addition to pigments, oils, scent, preservatives, colours, and textures, herbal lipstick also provides protection for the lips. Natural lipsticks with few negative effects. It has safe, natural substances or nutrients that maintain the health of lips. Lipstick that uses artificial colourants, which are comprised of dangerous chemicals, is particularly bad for our skin. Synthetic colour usage over an extended period of time may result in major health issues like skin blemishes, lip cancer, skin inflammation, etc. Lipstick can have a variety of harmful effects, including allergic reactions, nausea, dermatitis, drying of the lips, and even death. Because herbal compounds are safe, demand for cosmetics incorporating them has therefore expanded globally. The overview of numerous natural colourants used in herbal lipstick is the subject of this review paper.

Keywords: *Coal Tar Dyes, Lip Lacquer, Beta-Carotene, Flavoxanthin.*

Introduction

Colour plays a vital role in marketing any product such as cosmetics, food additives, pharmaceutical products etc. It gives the attractiveness for a product. Colour also helps to get the attention of the customers. Lipstick can have a variety of harmful effects, including allergic reactions, nausea, dermatitis, drying of the lips, and even death. Because herbal compounds are safe, demand for cosmetics incorporating them has therefore expanded globally.

In some cases, customers may experience injury if they regularly use synthetic items that contain ingredients like lead, petrolatum, and phthalates. These products may irritate the lips, leave them dry and chapped, and increase your risk of developing allergies, asthma, and cancer. Licking lips or eating and drinking while wearing lipstick are bad habits that might make things worse. Chemicals



that are dangerous, like the lead in lipsticks, shouldn't be disregarded because of their neurotoxic properties and long-term exposure.^[1]

In addition to pigments, oils, scent, preservatives, colours, and textures, herbal lipstick also provides protection for the lips. It is now a component found in practically all women's handbags. Smooth lips, shiny lips, shiny lips, and moist lips all require just little cosmetic adjustments. Because natural cosmetics are secure, herbal lipsticks are becoming more and more popular. To meet women's desire, the market offers hundreds of colour tones in both liquid and stick on lip application forms. Natural lipsticks with few negative effects. It has safe, natural substances or nutrients that maintain the health of lips.^[2]

SYNTHETIC AND NATURAL COLOURS

Synthetic Colours: Most of the colours used in cosmetics are synthetic dyes or colours. Chemicals like petroleum byproducts and earth minerals are used to make synthetic colours. Since they are made from coal tar, these synthetic colours are sometimes known as "coal tar dyes." In the year 1856, synthetic dyes were first discovered. These synthetic dyes are long-lasting, brighter in colour, and have cheap production costs. Natural colours are less stable than synthetic colours. They are extremely resistant to heat, light, and concentrations of hydroxyl ions. The harmful and cancerous effects of the synthetic colours were discovered later.

Synthetic dyes fall into five main categories: azo dyes, xanthenes, triarylmethane, quinoline, and indigoid. Azo dyes are utilised in the production of lip care products like lip gloss, lip stick, and lip lacquer because of their stronger red colour. Since these azo dyes are deemed to be more hazardous, Germany prohibited them in 1996. Additionally employed in the production of lip care products include xanthenes, triarylmethane, and quinoline.

Environmentally unfriendly are synthetic dyes. Synthetic dyes are related with a number of issues. People began using cosmetics produced with natural pigments as a result. Most people prefer to use natural dyes because they are concerned about their health and the environment.^[4]

Natural Colours: These are simple to prepare and biodegradable. Nowadays, there is a greater need for natural colourants in cosmetic products. The pigments used in natural colours are those created by microbes, plants, and animals. These natural pigments are non-carcinogenic, non-toxic, and environmentally beneficial. While most synthetic colours are soluble in oil or other solvents, the majority of these natural pigments are soluble in water. These natural pigments have numerous uses in the food, textile, pharmaceutical, and cosmetic industries since they are environmentally safe.^[4]

ADVANTAGES OF HERBAL LIPSTICK OVER SYNTHETIC LIPSTICKS

They are safe to use. They have fewer or no aspect impacts. They are non-toxic, highly lipophilic, anti-oxidants, anti-microbial, anti-inflammatory. Extensive range of color to choose from. Colorants has different original shades of color from purplish red, ruby red, beetroot purple, dark violet, pastel



red, pale red, purplish red, rose red, deep magenta, dark purple, orange, deep violet. Different combination and shades can be obtained from these colors. By adding organic and inorganic acids and bases color may be changed to different shades.^[1]

DIFFERENT TYPES OF NATURAL COLOURANTS USED IN LIPSTICK ARE

❖ Alkanet

- INCI: Alkanna Tinctoria Root Extract
- Solubility: Hydrophobic
- Main chemical pigment(s): Alkannin
- Colour: Red / purple

Alkanet is a herb in the borage family, whose roots yield a dark red dye. Although the plant's flowers are blue, it has a dark red root of blackish appearance externally but blue-red inside, with a whitish core. The main chemical compound found in alkanet root is called **alkannin**, which is soluble in alcohol, ether, and oils, but is insoluble in water. Keep in mind that alkanet root contains pyrrolizidine alkaloids, which are water-soluble compounds toxic for internal use in higher quantities. If you want to give your lip formulations a pleasant pinkish colour, choose for oil macerates rather than alkanet powder or water-soluble extracts like glycerites, which might not be appropriate (or safe) for this kind of product.^[3]

❖ Annatto

- INCI: Bixa 3rellana seed extract
- Solubility: Lipohilic (Bixin), Hydrophilic (Norbixin)
- Main chemical pigment(s): Norbixin, Bixin
- Colour: Orange / Red

The seeds of the achiote tree (*Bixa 3rellana*) are the source of the orange-red colouring agent known as annatto. The resinous outer layer of the plant's seeds is primarily responsible for the annatto's reddish orange colour dye. Bixin and norbixin, two carotenoids, are the chemical substances that give things their yellow to orange hue. Bixin, a lipophilic pigment, can be saponified to become norbixin, a water-soluble pigment. For carotenoids, annatto has a unique dual solubility feature that is uncommon. The seeds have a 4.5–5.5% pigment content, which is made up of 70–80% bixin. Annatto-based pigments are not precursors to vitamin A, in contrast to another well-known carotenoid called beta-carotene. A higher concentration of norbixin in an annatto colour makes it more yellow; a higher concentration of bixin makes it more orange.^[3]



❖ **Beetroot**

- INCI: Beta vulgaris (Beet) extract
- Solubility: Hydrophilic
- Main chemical pigment(s): Betanin
- Colour: Red / Pink

A popular natural colourant for water-based cosmetics is beetroot. Its primary component, betanin, breaks down when exposed to light, heat, and oxygen. To get a vivid pink or crimson glycerite that you may use in your emulsions or water-based gels and tonics, mix beetroot powder with glycerin. Bear in mind that because beetroot is water-soluble, it cannot be used in oil macerations.^[3]

❖ **Buriti**

- INCI: Mauritia flexuosa fruit oil
- Solubility: Lipophilic (the oil)
- Main chemical pigment(s): Beta-carotene
- Colour: Red / orange

The palm buriti is also cultivated in the Amazon region. The fruits resemble chestnuts in certain ways. The fruit pulp is orange-yellow and is used to make juice and cooking oils. The oil is used in frying and cooking and is edible. The fruit's oval seed is edible.

Compared to acai oil, buriti oil is comparable in that it contains over 70% oleic acid. Buriti is special due to its high beta-carotene concentration, which is even more intriguing. A carrot contains 6.6 mg of beta-carotene per 100g of carrot pulp, whereas a buriti fruit contains 30 mg of beta-carotene per 100g of fruit pulp, making it the richest natural source of the antioxidant. Even more beta-carotene is present in the oil, which has 330 mg per 100 grammes of buriti oil.^[3]

❖ **Calendula**

- INCI: Calendula officinalis flower extract
- Solubility: Hydrophobic
- Main chemical pigment(s): Flavoxanthin
- Colour: Orange

Typically, petal colours in the yellow to red range are caused by carotenoids. Combinations of these carotenoid pigments are primarily responsible for the diverse range of petal colour in different types of calendulas. Extracts of the petals of calendula cultivars with orange and yellow flowers have been found to contain 19 carotenoids. The primary carotenoid in calendula petals has been identified as



flavoxanthin, and it is evident that this pigment is what gives calendula petals their distinctive orange colour. Lycopene and lutein are two more carotenoids that have been found in calendula. Although it is not permitted for usage in the EU or the USA, flavoxanthin is utilised as a food additive under the E number E161a.^[3]

❖ Carrot root

- INCI: *Daucus carota sativa* root extract
- Solubility: Hydrophobic
- Main chemical pigment(s): Beta-carotene
- Colour: Orange

Carotenoids, so named because they make up the majority of the pigment in carrot roots (*Daucus carota*), are unquestionably some of the most prevalent and significant pigments in living things. Carotenoids are the pigments that give many plants their colours, notably the roots of carrots. Apart from chlorophylls, carotenoids make up the majority of the oil-soluble colours in nature. The primary colour in carrot roots is produced from beta-carotene. Organic skincare products frequently contain macerated carrot root, which has a lovely orange tint.^[3]

❖ Elderberry

- INCI: *Sambucus nigra* extract
- Solubility: Hydrophilic (extract)
- Main chemical pigment(s): Cyanidin 3-glucoside
- Colour: Red / purple

Given that both elderberry and acai berries have a rich purple colour, it should not be surprising that they both contain some of the same chemical pigments and natural colourants. A very water-soluble anthocyanin called cyanidin 3-glucoside is what gives it its primary pigment.^[3]

❖ Hibiscus

- INCI: *Hibiscus rosa-sinensis* flower extract
- Solubility: Hydrophilic
- Main chemical pigment(s): Cyanidin-3-sophoroside, Cyanidin-3-sambubioside, Delphinidin-3-sambubioside
- Colour: Red / pink



Anthocyanins, the red pigments found in the red blooms of the Hibiscus species, are frequently utilised as colouring agents. The primary chemical pigment thought to be present in hibiscus petals of the species *Hibiscus rosa-sinensis* is cyanidin-3-sophoroside. Additionally, extracts of a Hibiscus species known as Roselle (*Hibiscus sabdariffa*), assumed to be indigenous to West Africa, are made. The two anthocyanins cyanidin-3-sambubioside and delphinidin-3-sambubioside that are most prevalent in *Hibiscus sabdariffa*.^[3]

❖ Madder

- INCI: *Rubia tinctorum* extract
- Solubility: Mildly hydrophilic
- Main chemical pigment(s): Alizarin and Purpurin
- Colour: Red / purple

The Mediterranean native madder was previously a popular plant for growing dyes. The plant has been employed as a source of a long-lasting red dye because its generic name, *Rubia*, signifies red. The plants' rootstock, which is two to three years old and is still red after drying, is used medicinally. Alizarin and purpurin, two red chemical compounds generated from the roots and tubers, are among the ingredients. Anthraquinone glycosides are another.^[3]

❖ Pomegranate

- INCI: *Punica granatum* fruit extract
- Solubility: Hydrophilic
- Main chemical pigment(s): Punicalagin
- Colour: Red / purple

Although the inedible fruit peels are the main source of colourants in pomegranate, anthocyanins are water-soluble pigments that are chiefly responsible for the appealing red/purple colour of pomegranate juice. Punicalagin, punicalin, gallic, and ellagic acids are some of its main components. Alkaloids like isopelletierine are also present in it. Due to the presence of a significant number of tannins, *punica granatum* dye and many other common natural dyes are considered to be powerful antibacterial agents.^[3]

❖ Red Sandalwood

- INCI: *Pterocarpus santalinum* extract
- Solubility: Hydrophobic
- Main chemical pigment(s): Santalin
- Colour: Red



Santalin, a complex chemical, is the red pigment derived from *Pterocarpus santalinum*, sometimes known as red sandalwood. This fundamental structure comes in a variety of variations, all of which produce fairly strong red tones. Comparatively speaking, this red's stability is really good. It has been in use for many ages in custom. The constituents of red sandalwood produce the colours Santalin A or B, which are red, or Santalin Y, which is yellow.^[3]

❖ Rosehip

- INCI: *Rosa canina* fruit oil
- Solubility: Lipophilic
- Main chemical pigment(s): Lycopene, Beta-carotene
- Colour: Red / Orange

The reddish colouring, which is linked to the carotenoid content, gives cold-pressed rosehip oil its distinctive appearance. In contrast, the oil obtained through solvent extraction has a yellowish hue. This may be because the organic solvent can extract pigments and a number of other compounds from the seeds, or it may be because the high temperature of the oil extraction process causes the red pigment to degrade. Rosehips contain three carotenes and six xanthophylls, totaling nine carotenoids. These fruits are among those with the greatest range of carotenoid colours due to the huge number of chemicals they contain. The highest levels of total carotenoids, which are primarily made up of lycopene and beta-carotene, were found in rose hips.^[3]

❖ St. John's Wort

- INCI: *Hypericum perforatum* flower extract
- Solubility: Lipophilic and Hydrophilic
- Main chemical pigment(s): Hypericin
- Colour: Red

St. John's Wort contains the brilliant red pigment hypericin. Despite the herb's beautiful yellow blossoms, the macerated oil is a deep crimson colour. The oil turns a dark red after steeping these flowers in it for a while, and it can be utilised in anhydrous or emulsified formulations. One of the most well-known chemical components of St. John's Wort, along with hyperforin, is hypericin, which is thought to have antibacterial, antiviral, and antidepressant characteristics. One half of the molecule in hypericin is hydrophilic (loves water), and the other half is hydrophobic (rejects water), giving it a special molecular structure.^[3]



❖ Tomato

- INCI: Solanum lycopersicum extract
- Solubility: Lipophilic
- Main chemical pigment(s): Lycopene
- Colour: Red / Orange

Lycopene, and -carotene, lutein, zeaxanthin, and b-cryptoxanthin are the tomato's main nutrients. Red carrots, watermelons, gac, and papayas are just a few examples of the red fruits and vegetables that contain lycopene, a vivid red carotene and carotenoid pigment and phytochemical. The pigment found in tomato-based sauces, lycopene, is insoluble in water. Only organic solvents and oils may dissolve it. About 80–90% of the carotenoid content of red, ripe tomatoes is made up of it. The carrot's yellow pigment, beta-carotene, is an isomer of lycopene.^[3]



Figure No I: (1) Alkanet, (2) Annatto, (3) Beetroot, (4) Buriti, (5) Calendula, (6) Carrot Root, (7) Elderberry, (8) Hibiscus, (9) Madder, (10) Pomegranate, (11) Red Sandalwood, (12) Rosehip, (13) St.John's Wort, (14) Tomato.



CONCLUSION

In most industries, including the food business, the pharmaceutical industry, and the cosmetics industry, synthetic dyes were utilised extensively as colourants. These synthetic colours have a number of restrictions and issues. They do not respect the environment. Because they are non-degradable and have a carcinogenic quality, synthetic colours are poisonous. The majority of artificial dyes are regarded as xenobiotics. The health of humans is impacted in a number of ways by synthetic dyes like azo dyes. People prefer to utilise natural pigments as colourants for these reasons. Natural colours come from a variety of sources, including microbial life, plants, and animals. Plant pigments and microbial pigments are two of the most commonly utilised natural pigments. Animal pigments are not commonly used because of various ethical concerns. These eco-friendly natural pigments have no negative effects on humans. As a result, these natural pigments are sourced from diverse places and employed in a variety of industries, including the food business as a colouring and flavouring agent, the cosmetics industry as an antioxidant and a colouring agent, and the pharmaceutical industry as a colouring and due to their medicinal properties. Natural pigments also have some drawbacks, such as short-term stability and a lack of much brighter colour than synthetic dyes. When compared to synthetic colours, natural dyes are thought to be safer and less poisonous, despite the fact that they have some drawbacks as well. To prevent serious health issues, it is preferable to use natural colours and ingredients in cosmetic products.

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