VOLUME 12 ISSUE 1 2026

ISSN 2454 – 3055

INTERNATIONAL JOURNAL OF ZOOLOGICAL INVESTIGATIONS

Forum for Biological and Environmental Sciences

Published by Saran Publications, India

International Journal of Zoological Investigations Vol. 12, No. 1, 156-164 (2026)

International Journal of Zoological Investigations
Contents available at Journals Home Page: www.ijzi.net
Editor-in-Chief: Prof. Ajai Kumar Srivastav
Published by: Saran Publications, Gorakhpur, India

ISSN: 2454-3055

Herbal Kajal: A Review

Varaprada D.[1], Sandeep P.[2], Akhila G.[2], Radheshyam R.[2] and Blessi Priyanka K.[2*]

[1]Department of Pharmaceutical Chemistry, Osmania University, Hyderabad 500007, Telangana, India
[2]Department of Pharmaceutical Chemistry, Kakatiya University, Warangal 506009, Telangana, India

**Corresponding Author*

Received: 13th May, 2025; **Accepted:** 22nd November, 2025; **Published online:** 25th January, 2026

https://doi.org/10.33745/ijzi.2026.v12i01.014

Abstract: Herbal kajal, a traditional Ayurvedic cosmetic, has been used for centuries to promote eye health and beauty. Kajal, formerly called as kohl or Surma, is used as a striking cosmetic. This review explores the historical and cultural significance of herbal kajal, its chemical composition, and its evaluation tests. We also discussed the modern applications of herbal kajal, including its use as a natural remedy for eye-related issues and its potential as a sustainable alternative to traditional cosmetics. This article provides a comprehensive overview of herbal kajal's composition, introduction, and evaluation through various standardized tests. We explored the herbal ingredients used in herbal kajal, their pharmacological properties, and the product's physicochemical and microbiological characteristics. The review also includes clinical evaluations of herbal kajal's efficacy and safety, highlighting its potential benefits and limitations. It also aims to provide a scientific basis for the use of herbal kajal, guiding researchers, manufacturers, and consumers in their decision-making processes. The concept of producing herbal kajal with medicinal herbs for enhancement is both novel and groundbreaking.

Keywords: Kajal, Surma, Kohl, Herbal, Medicinal herbs, Eye health, Ayurvedic cosmetic

Citation: Varaprada D., Sandeep P., Akhila G., Radheshyam R. and Blessi Priyanka K.: Herbal kajal: A review. Intern. J. Zool. Invest. 12(1): 156-164, 2026.

https://doi.org/10.33745/ijzi.2026.v12i01.014

Introduction

The link between the inner and outside worlds is the eye. The element of fire and light that controls our eyes is represented by the Pitta dosha in Ayurveda. Therefore, the most vital organ in our body system is the eye. Vedic science provides a number of safe, natural, and efficient methods to take care of the eyes, particularly for aesthetic purposes (Bhinge *et al*., 2019). Several herbs and plants were employed in Ayurvedic cosmetics, which served as a barrier against all external effects on the body in addition to beautifying the skin. Furthermore, plant-based ingredients are utilized in cosmetics for practical functions like thickening, preservatives, antioxidants, immuno-stimulants, sunscreen, whitening, moisturizing, and coloring. For starters, kajal is a cosmetic that

can not be used in eye products. Since ancient times, eye cosmetics have been used to draw attention and accentuate the eyes in order to increase their perceived beauty and attractiveness (Sangale and Bhangale, 2023). The use of herbal kajal dates to ancient civilizations, where it was used to protect the eyes from the harsh desert sun and to add beauty to the eyes. The traditional recipe for herbal kajal involves a combination of herbal ingredients, including plants, minerals and other natural substances. Herbal kajal is made by combining the herbal ingredients with a natural binding agent, such as ghee or oil, to create a smooth and creamy paste. For a very long time, people have used eye makeup to enhance their appearance and boost their confidence or to catch other people's attention. Cosmetics for the eyes include such as eyeliners, mascara, eyeshadow, eyelashes, and makeup kajal (kohl) (Gupta *et al*., 2016). In Indian culture kajal a thick, black ointment concoction, is used as eye liners to promote eye health. In India, one fingertip is typically used to apply kajal to the inner rim of both the top and lower lids of the eyes. Castor oil and camphor are combined with soot from an oil lamp to create pure handmade kajal. Kohl is mostly utilized to maintain healthy, cool eyes. They are also making improvements to their appearance. Additionally, kajal's are made with a number of artificial chemicals that irritate, etch, and infect the eyes. In India, the cost of kajal varies according to the product's brand, size, and content. Before being put on the market, all branded cosmetics must meet strict WHO regulations. The majority of nations have outlawed animal testing. EU nations have agreed to end animal experimentation by 2013 (Randive *et al*., 2020) In this field, using materials and substances obtained from animals as well as using animals for scientific research are both causes for worry. The 1940 Drugs and Cosmetics Act address the quality and standards of medications and cosmetics produced and marketed in India (Kute *et al*., 2023).

Kajal is referred to as Anjanum, or eye ointment, in the Ayurvedic language. Many kinds of medicinal plants are used to treat eye disorders. The healthcare sector continues to face difficulties in combating eye conditions and developing chemicals without adverse effects. Nonetheless, the drawbacks of conventional medications can be avoided by using Ayurvedic herbs. As a result, a lot of work has gone into finding novel therapeutic herbs. Its effectiveness, minimal side effects, and affordable price all contribute to this. Kohl is a common eye solution that is used to prevent and treat eye disorders. It is characterized as cool and clean for the eyes in practically every human culture (Varpe *et al*., 2022)

History:

Dheeraj *et al*. (2020) aimed to prepare and evaluate carbon based kajal formulation and carry out its comparative evaluation with the marketed formulations of kajal. First, using specially made equipment, carbon soot was applied to aloe vera mucilage that had been spread out on a copper plate. After that, the sun-dried plate was left to sit in the cow ghee flame for an hour. After scraping the soot that had accumulated on the copper plate and characterizing it using SEM, TEM, FTIR, XRD, and EDX, kajal was made by mixing a few drops of cow ghee with it. The five commercially available kajal formulations in India were compared to the kajal. Their antibacterial potential against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Escherichia coli* was evaluated based on physical properties. The physical properties of each formulation were nearly identical. The pH of the prepared kajal was 7.06±0.13. The marketed formulations' antibacterial efficacy was much lower than that of freshly generated formulations, which showed zones of inhibition against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *E. coli* of 13.05±0.11, 20.08± 0.13, and 22.06± 0.18 mm, respectively. EDX spectra confirmed the lack of lead (Pb) and showed that the weight percentage of carbon and copper in the cow ghee soot was 79.20 and 17.10 percent, respectively. The developed formulation did not cause any irritation, redness, watering of the eye, or swelling in the test animal, according to the ocular

irritation test (OECD 405). Beatification and the treatment of ocular conditions, particularly in children, can both be accomplished safely with prepared kajal (Dheeraj *et al*., 2020).

Sajitha *et al*. (2015) planned to formulate Ayurvedic Kajal using two medicinal herbs, *Eclipta alba* (EA) and *Vernonia cinerea* (VC), and assess their potential for long-term ocular delivery. Standardization of the herbs was undertaken using various physiochemical criteria, and the results were within the allowed limits. The ingredients utilized in this study were standardized using the TLC method, while the procedure was standardized using organoleptic characteristics, which resulted in identical properties in terms of color, odor, and consistency. Furthermore, product consistency was assessed using a penetrometer, moisture content test, TLC of the various extracts, microbiological contamination, and skin toxicity test. Different extracts for both plants were tested, including methanolic extract, lamp black extract, methanolic Kajal extract, and hexane extract, and all but the hexane extract had positive results. When evaluated on New Zealand white strain rabbits, all of the methods produced substantial results without causing any adverse reactions. As a result, the findings revealed that the EA and VC-formulated Kajal is completely safe and can be employed in unique cosmetic formulations (Gujar *et al*., 2023).

EA and VC herbs were chosen for this investigation in order to manufacture Kajal using various extracts. EA is a plant that is a member of the Asteraceae family and is also referred to as False Daisy and Bhringraj. It is indigenous to Asia, particularly India, China, Thailand, and Brazil, and it is widely dispersed throughout the world's tropical and subtropical regions. The leaf extract of EA is regarded in Ayurvedic medicine as a potent liver tonic, a rejuvenator, and particularly beneficial for hair. EA sells a black dye that is used for tattooing and hair coloring. In terms of medicine, the plant extract prevents jaundice, fights bacteria, and has hepatoprotective, antihypertensive, diuretic, and antioxidant properties. EA is a key component of Vedic Guard, a polyherbal product that combines 16 extracts from medicinal plants in a synergistic manner. However, there are currently few reported marketed formulations. Also known as ash-colored fleabane, VC is a member of the Asteraceae family and is widespread all throughout India. In cases of fever, the entire VC plant is said to encourage sweating. The leaves help with ringworm, eczema, humid herpes, and guinea worms, and elephantiasis.

The herbal kajal using dill seeds, cow ghee, coconut oil, camphor and evaluated for pH, spreadability, antimicrobial activity, stability studies, acid value, saponification value (Gujar *et al*., 2023). The formulated herbal kajal taking triphala powder, coconut oil, almond powder, cow ghee, honey, and evaluated for pH, acid value, saponification value, spreadability and anti-microbial activity (Varpe *et al*., 2022). They reviewed marketed kajal's by taking melting point, peroxide value, freedom of grits, heavy metals, microbial examination, softening point, breaking load point, pay off test, color intensity of kajal after application, spreadability.

Artificial Kajal vs Herbal Kajal:

Kajal is a cosmetic tool that is driven by the eyes. Actually, the majority of people utilize kajal as their first cosmetic product to enhance the appearance of their eyes. Utilizing kajal can date its beauty and its therapeutic advantages for over 5,000 years. Initially, ghee, vegetable oil and camphor were used to make kajal at home. Over time, Kajal became a commercial product. Kajal is utilized in the production of numerous commercial and natural products. Because lead is frequently utilized in the production of commercial kajal, it is known damaging to the eyes. Kajal affects the structures of the body as well as the skin. Consequently, kajal that is herbal or Ayurvedic can be used. Organic kajal is completely fresh because it is made with natural substances. The components in Ayurvedic kajal are therapeutically useful to the body. The eyes

are nourished and moisturized when organic kajal is used. This kajal is frequently used to cleanse the skin from pollutants. The Ayurvedic kajal improves the clarity of the eyes by strengthening their muscles. Tear fluid tends to drain faster when the kajal is utilized, as opposed to utilizing an industrial kajal. Because of its astringent qualities, natural kajal frequently melts in the eyes of tiny red vessels to keep them clean.

Advantages of Herbal Kajal over Synthetic Kajal:

- Using organic kajal helps to moisturize the eyes.
- Using this kajal frequently helps to purify the skin by eliminating impurities
- It does not cause irritation.
- It is made entirely of natural herbs.
- It has ophthalmological and clinical approval.
- Herbal kajal cosmetics are safer to use than synthetic ones.
- Any age group can utilize herbal kajal.
- Additionally, it cleanses and keeps pollutants out of the eyes.
- The eye muscles and nerves are strengthened, and their shine is enhanced by herbal kajal

Disadvantages of synthetic kajal:

The components of kajal were empirically determined or chosen. The rough manufacture of kajal made it impossible to determine the concentration of each ingredient and its actual effect on the eye.

- Kajal may be bad for your skin.
- Chemical, toxic, and contagious conjunctivitis
- Allergy
- Stye and Hordeolum: infections of the glands of the eyelids.
- Corneal ulcer: has the potential to cause blindness.
- Uveitis: some of the chemicals in kajal may cause inflammation in the eye.
- glaucoma: some of the ingredients may cause eye pressure to rise, which can lead to glaucoma
- Dry Eye: frequent use of kajal may cause lacrimal gland and tear scarring, which may result in dry eye syndrome.
- Conjunctivitis

Plant Materials Used in Preparation of Kajal:

- Coloring Agents: Acai, Avocado, Blue Tansy, Hemp
- Oils: Coconut Oil, Almond Oil
- Cooling Agents: Castor Oil, Camphor
- Herbal Or Botanical Extracts
- Moisturizing agents: Aloe Vera, Ghee
- Waxes: Beeswax, Carnauba wax, Ozokerite wax

(1) *Colouring Agents*:

Acai:

Synonyms: Euterpe fruit, Brazilian berry

Biological Source: It is produced as Acai fruit from plant *Euterpe oleracea*.

Family: Arecaceae

Acai berries have a deep purple colour. Their main chemical components are anthocyanins, which comprise cyanidin-3-glucoside and cyanidin-3-rutinoside and are mostly present in açaí fruits. Phenolic acids, flavanol derivatives and other flavone and flavanol glycosides are also present in these fruits. Furthermore, the fruit yields a deep green oil that is derived from the pulp of the Brazilian Açaí palm (Sangale and Bhangale, 2023).

Avacado:

Synonyms: Butter fruit, Alligator pear

Biological Source: It is produced as avocado fruit from plant *Persea americana*.

Family: Lauraceae

Among the 600 naturally occurring carotenoids, lutein is one of the main pigments found in avocado oil. Similar to other xanthophylls, lutein is plentiful in green crops like spinach, kale, and avocado and is only synthesized by plants (Gupta *et al*., 2016)

Blue Tansy:

Synonyms: *Tanacetum annum*.

Biological Source: It is obtained from the aerial parts mainly flowers of the plant *Tanacetum annuum.*

Family: Asteraceae.

Chamazulene is a chemical produced by German chamomile. This substance is created during steam distillation and is also present in Blue Tansy (17–38% Chamazulene in the essential oil) (Sangale and Bhangale, 2023).

Hemp:

Synonyms: Bhang, Ganja, charas

Biological Source: It is obtained from the stem, seeds, and leaves of the plant *Cannabis sativa*

Family: Cannabaceae

Hemp oil's high chlorophyll content gives it a vibrant green colour. The amount of chlorophyll in hemp oil produced by supercritical CO_2 is three times greater and four times higher than overall amount of carotene in comparison to cold-pressed oil. While it is insoluble in water, chlorophyll is soluble in alcohol and oil (Gupta *et al*., 2016).

(2) *Oils*:

Almond Oil:

Synonyms: *Oleum amygdalae*

Biological Source: It is obtained from dried kernels of seeds of *Prunus amygdalus* var. *dulcus* or *Prunus amygdalus* var. *amara*

Family: Rosaceae

Almond oil lightens dark circles beneath the eyes and reduces puffiness. These are the anti-inflammatory and antioxidant properties. Almond oil also contains vitamin E, vitamin K and retinol, which support the maintenance of sensitive skin under eyes that are smooth and free of irritation. The dilated blood vessels that are creating the discolouration may also be contracted with the aid of these naturally occurring substances.

Coconut Oil:

Botanical Name: Oleum cocos, cocos nucifera

Biological Source: It is obtained from dried kernel of the coconut palm *Cocos nucifera* L.

Family: Arecaceae

This oil is perfect for persons with dry eyes since it lowers evaporation by forming a protective layer over the tear film layers. Antiviral, antimicrobial, antiparasitic, and anti-inflammatory effects are among the qualities of coconut oil (Popali and Gurunani, 2024).

(3) *Herbal and Botanical Extracts*:

Herbal kajal can contain herbs and botanical extracts like amla (Indian gooseberry), triphala (a combination of three fruits), and others. These substances are frequently included for their possible advantages to eye health and skin.

Uses: Antioxidant action; used for free radical scavenging in cell-free experiments; and helps calm inflammed eyes.

Amla:

Synonyms: Gooseberry

Biological Source: It is obtained from fresh fruits of *Embelica officinalis*

Family: Euphorbiaceae.

Triphala:

Synonyms: Vara phalatrikam or Sresthatamam.

Biological Source: *Embelica officinalis*

Family: Combretaceae.

Use: Triphala is utilized in kajal as an anti-inflammatory agent (Popali and Gurunani, 2024).

Dill Seeds:

Synonyms: Sowa

Biological Source: Dill seeds are dried ripe fruits of the plant *Anethum graveolens* L.

Family: Umbelliferae

Vitamin A, which is abundant in dill weed, is essential for maintaining eye health and preventing retinal damage. Due to its antioxidant qualities, dill weed, and other vitamin-rich foods have been shown in numerous studies to enhance vision and prevent a number of eye-related conditions, including cataracts and macular degeneration (Gupta *et al*., 2016).

Azadirachta indica:

Botanical Name: Margosa

Biological Source: It is obtained from fresh or dried leaves and seed oils of *Azadirachta indica*

Family: Meliaceae

It is very useful in blood disorders, eye diseases, intermittent fever, as well as persistent low fever. Oil is very useful in leprosy, skin diseases, ulcers, and wounds. The bark contains a resinous bitter principle and is usually prescribed in the form of a tincture or an infusion. It is also regarded as beneficial in malarial fever (Volpe *et al.,* 2012). The antioxidant property of *Azadirachta indica* has been reported (Tamalli *et al*., 2013).

(4) *Moisturizing Agents*:

Aloe vera:

Synonyms: Aloe, Musabbar, Kumari. *Biological Source*: Aloes are the dried juice obtained by transversely cut leaves of various species of *Aloe barbedensis* Miller (known as Curacao aloes), *Aloe perryi* Baker (Socotrine aloes), *Aloe spicata* Baker and *Aloe africana* Miller (Cape aloes).

Family: Liliaceae

Aloe vera is frequently applied to the area around the eyes to promote skin healing to reduce edema or puffiness. Hydrate skin that is flaky or dry. Aloe vera's water content and enzymes might lessen itching and flakiness while hydrating the skin. In chilly weather, aloe vera may help to avoid dry skin. Aloe vera may also help to remove oil from the skin by acting as a mild cleanser (Gupta *et al*., 2016).

Cow Ghee:

Pure cow ghee contains vitamin A and has a remarkable lubricating ability. Omega 3 fatty acids, which are abundant in it, aid correct vision issues in order to preserve the best possible eye health. Ghee's texture, colour, and taste vary depending on butter quality, milk utilized, and boiling time.

Uses: Cow ghee is used to brighten; it helps reduce dark stains; and it moisturizes and hydrates skin (Sangale and Bhangale, 2023).

(5) *Waxes*:

Beeswax:

Biolocal Source: It is obtained from honeycomb of bees *Apis mellifera*.

Family: Apidae

Beeswax is a naturally occurring wax that is made by *Apis* honeybees. Worker bees' abdomen segments have eight wax-producing glands that shape the wax into scales which throw it into the hive. It is collected and used by the hive workers to create cells that store honey and provide protection for the beehive's larvae and pupae. From prehistoric times, beeswax has been utilized as the first plastic, a lubricant and waterproofing agent, in lost wax casting of metals and glass, as a polish for leather and wood, as a component of cosmetics, as an artistic medium in encaustic painting, and for the creation of candles.

Carnauba Wax:

Synonym: Brazil wax, Palm wax

Biological Source: It is obtained from the leaves of the *Carnauba palm.*

Family: Arecaceae.

This substance is frequently used to make eyeliners and mascaras stronger and more waterproof. But the oil glands at the base of your eyelashes may become clogged if you put carnauba wax or other waxes on them and in the area around your eyes. Since oil secretions are required to maintain the correct lubrication of the eyes, this may lead to dry eyes (Gupta *et al*., 2016).

Ozokerite wax:

Synonyms: Earthwax, Mineral wax

It serves as an emulsion stabilizer, binder, and viscosity-boosting agent in cosmetic products. As per research Ozokerite waxes can help keep emulsions from separating into their liquid and oil components by thickening the oil component of cosmetics and personal care products, according to study. A mineral wax called ozokerite is used to improve the texture of cosmetics, particularly to stabilize and maintain the blend of Kajal stick foundations (Sangale and Bhangale, 2023).

(6) *Cooling Agents*:

Castor Oil:

Biological Source: It is obtained from seeds of *Ricinus communis***.**

Family: Euphorbiaceae

Castor oil is known for its mild and beneficial effects on health. For fatigued eyes, a brief massage with castor oil helps to keep the eyes cool. It moisturizes undereye regions. It relieves the eyes.

Camphor:

Biological Source: Camphor is obtained through steam distillation of the wood of a plant *Cinnamomum camphora***.**

Family: Lauraceae

Camphor, a waxy, flammable, transparent solid with a strong aroma is found in the wood of the camphor laurel, a large evergreen tree in East Asia, and the kapur tree, a tall timber tree in Southeast Asia. It helps to cool the eye and reduce discomfort and pain. Camphor, a chemical, was traditionally produced by distilling the bark and wood of the camphor tree. Today, camphor is mostly derived from turpentine oil. Camphor has a unique odour. Products made from camphor include camphorated spirits and oil (Gupta *et al*., 2016).

Rose Oil:

Synonyms: Attar of rose, Otto of rose, Rose otto

Biological Source: Obtained from fresh petals of different varieties of roses

Family: Rosaceae

Rose oil, also known as rose otto, attar of roses, or rose essence, is an essential oil derived from rose petals of various varieties. Rose ottos are extracted by steam distillation. Rose absolutes are obtained through solvent extraction, with absolutes being more widely utilized in perfumery.

Uses: It works as an anti-aging agent, reducing wrinkles; helps repair cell tissue; treats inflammation and irritation, such as eczema and allergic rashes (Popali and Gurunani, 2024).

Evaluation Tests:

(i) *Organoleptic Properties Determination*

The formulations of Kajal and Kohl were assessed based on their color, texture, consistency, and Odor (Randive *et al*., 2020).

(ii) *pH Determination*:

The pH of the produced mixture is measured with a pH meter. After being weighed, one gram of the kajal sample was mixed with 25 ml of dimethyl sulfoxide (DMSO) and allowed to set for 2 h. The pH value of the kajal mixture was measured three times, and an average was determined (Gupta *et al*., 2024).

(iii) *Spreadability*:

To ascertain the spreadability of kajal formulations, a sizable amount of kajal sample was collected on glass slides. For 5 min, the weight was placed on the slides to press the kajal samples to the same thickness. Weight has been added to the

pan. The time required to divide two slides served as a gauge of the spread.

Spreadability = M. L / t

The weight (g) attached to the upper glass slide is denoted by M; L is the distance travelled on the slide in centimetres; Time to separate the slide is denoted by t (Kapoor, 2001).

(iv) *Viscosity Determination*:

The Brookfield viscometer is used.

(v) *Irritability Test*:

A tiny amount of product was applied to the skin and left on for a few minutes; it was determined to be non-irritating (Kute *et al.*, 2023).

(vi) *Microbiological Test*:

The antimicrobial activity of the kajal mixture was tested utilizing agar well diffusion techniques. For 48 h at 37 °C, sterile agar was incubated with bacteria. The sterile bores were created with an 8mm diameter and filled with a DMSO-diluted kajal solution. The plate was incubated for 48 hours at 37°C. The zone of inhibition was measured (Kapoor, 2001).

(vii) *Acid Value*:

The quantity of potassium hydroxide required to neutralize the free acid in one gram of the material is indicated by the acid value. To determine the material, properly weigh 10 g into a 250 ml conical flask, add 50 ml of alcohol, and 1 ml of phenolphthalein. Warm up on a water bath, if necessary, until the material has dissolved. Titrate with 0.1 N potassium hydroxide. Shake regularly till a pink colour is obtained. Take note of the amount of milliliters necessary and use the formula to calculate the acid value.

Acid value = 5.61 N/W

Where, W is the weight of the material collected in grams and N is the number of millilitres of 0.1 potassium hydroxide needed (Volpe *et al.*, 2012).

(viii) *Saponifiaction Value*:

A conical flask was filled with roughly 2 g of paraffin wax, and the paraffin's weight was calculated as w g. The paraffin wax was dissolved in 25 ml of 0.5 N alcoholic potassium-hydroxide solution. After that, the reaction mixture was refluxed for 30 min on a water bath using a water condenser. The resulting solution was cooled and titrated against a 0.5 N HCl solution adding 1 ml of phenolphthalein as an indicator. The requirement for acid in millilitres was recorded (a). An identical blank experiment (leaving the paraffin wax) was performed. Number of ml of hydrochloric acid required was noted (b). (Sai Manoj *et al*., 2023).

Volume of acid needed to neutralize the remaining KOH * Equivalent factor * 1000/w

Saponification value= (b-a) *0.02805*1000/w

(ix) *Ester Value*:

The quantity of potassium hydroxide in milligrams needed to react with fatty acids in glyceride form in one gram of material (Randive *et al*., 2020).

Ester value = saponification value - acid value

Conclusion

Herbal cosmetics are used for medical purposes by more than 70% of Indians. Natural ingredients like oils, waxes, natural color, scents, and plant pieces like leaves are used in the scientific formulation of herbal kohl. Herbal kohl has several advantages, such being safer, less expensive, and having no negative effects on the environment. If these herbs are appropriately standardized and regulated, the herbal cosmetics industry will expand immensely. Herbal kajal formulations can protect, hydrate, and nourish the delicate skin surrounding the eyes. It is safer to utilize this natural substitute for common kajal products. It can offer a safe, mild, and long-lasting solution for enhancing eye appearance. It embodies a rich cultural heritage based on customs from many different cultures. Sustainable beauty products that respect indigenous knowledge and benefit local communities are becoming more and more well-liked. To enhance herbal kajal formulations, maximize efficacy, and find novel ingredients with

therapeutic properties, more investigation and creativity are required. Several tests are used to assess the safety, effectiveness, and purity of herbal kajal. To make sure the product meets cosmetic criteria, a number of parameters are assessed, including color, texture, consistency, pH and spreadability. Herbal kajal is a promising natural cosmetic that may offer a secure and efficient substitute for conventional eye makeup. The need for herbal kajal is anticipated to increase as customers realize how important it is to use natural and organic products.

Ethical Statement

This is a review article hence no Ethical Approval needed.

Author Contributions

Each author has contributed equally to the study's planning, analysis, writing, and editing. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

References

Bhinge SD, Bhutkar MA, Randive DS, Wadkar GH, Kamble SY, Kalel PD and Kadam S. (2019) Formulation and evaluation of polyherbal gel containing extracts of *Azadirachta indica*, *Adhatoda vasica*, Piper betle, *Ocimum tenuiflorum* and *Pongamia pinnata*. J Res Pharma. 23(1): 44-54.

Dheeraj S.R, Somnath D B and Namdeo RJ. (2020) Carbon based Kajal formulations. J Pharmaceut Res Int. 32(13): 62-74.

Gujar SV, Bhosale SS, Walunj SG and Paymode SP. (2023) A review on formulation and evaluation of herbal Kajal. Int J Adv Res Sci Communic Technol. 3(1): 81-88.

Gupta P, Tiwari S, Pandey S and Azaj A. (2024) Sacred eyes: Formulation and evaluation of *Ficus religiosa* herbal kajal, Int J Sci Res Updates 8(2): 67-76.

Gupta R, Hafsa A, Sehgal S and Dwivedi H. (2016) Formulation, preliminary evaluation and antimicrobial activity of a herb based kohl. Int J Phytocosmetics Natural Ingredients 3: 5.

Kapoor LD. (2001) Handbook of Ayurvedic Medicinal plants. CRC Press, Boca Raton, FL.

Kute SS, Sangale SL and Bhangale CJ. (2023) Formulation and evaluation of herbal kajal. Int J Pharmaceut Sci. 1(7): 302-305.

Popali Khushi J and Gurunani Shailju G. (2024) Preparation and evaluation aspects of herbal kajal. Int J Sci Res Sci Technol. 11(5): 418-425.

Randive DS, Bhinge SD, Jadhav NR, Bhutkar MA and Shirsat MK. (2020) Assessment of antimicrobial efficacy of kohl/kajal prepared by different Indian methods against selected microbial strains. Int J Curr Pharmaceut Res. 12(3): 37-44.

Sai Manoj G, Varaprada D, Abesana Chanu K, Ritheesh M and Blessi Priyanka K. (2023) Formulation and evaluation of poly herbal soap. Indo American J Pharmaceut Res 13(10): 1185-1189.

Sajitha P, Dang R and Das K. (2015) Total safety management through standardization of formulated ayurvedic Kajal using *Eclipta alba* and *Vernonia cinerea* herbs. World Sci News 11: 31-43.

Sangale SL and Bhangale CJ. (2023) Review on herbal kajal. Int J Innov Sci Res Technol. 8(3): 1046-1050.

Tamalli M, Gamal MAB and Alghazal MA. (2013) Microbiological quality assessment of some brands of cosmetics eye preparations sold in Libyan markets. Int J Sci Res. 4(10): 1349-1355.

Varpe P, Ganesh M, Wakale MT, Jadav AP and Lokhande R. (2022) Formulation and evaluation of medicated herbal kajal", International Journal of Scientific Research in Science and Technology, 9(3): 565-571.

Volpe MG, Nazzaro M, Coppola R, Rapuano F and Aquino RP. (2012) Determination and assessments of selected heavy metals in eye shadow cosmetics from China, Italy, and USA. Microchemical J. 101: 65-69.