IOSR Journal of Pharmacy
(e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219
Volume 16, Issue 8 Series. I (August 2026), PP. 09-14
www.iosrphr.org

Formulation, Development and Evaluation of Natural Herbal Eye Cosmetic

G.Swetha, U.Tejaswini, B.Chanti Kumar,P.Sandeep, K.Blessi Priyanka
University College of Pharmaceutical Sciences,Kakatiya University,Warangal, Telangana.
Received 14 August 2026; Accepted 27 August 2026

ABSTRACT: A seven different herbal kajal formulations were prepared by using different concentrations of bhring raj and orange peel extracts. Bhring raj leaves and orange peels were collected, washed with tap water, then with distilled water. They were left until become completely dried. By using different concentrations of extracts kajals were formulated. The formulations were examined for the physicochemical properties, pH, IR, irritability and spreadability. All formulations showed better results. Among the seven formulations no.F1 and F2 are considered as best formulations. These formulations will be used for beatification purpose.
KEYWORDS:kajal, bhring raj, orange peel

I. INTRODUCTION:

According to The Federal Food and Drug Cosmetic Act criteria (2015), cosmetic means the articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance and articles intended for use as a component of any such articles; except that such term shall not include soap.

Kajal, also known as Surma or Kohl, is a visually arresting cosmetic. Ayurvedic 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 of 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. Keeping this entire thing we have formulated seven different kinds of kajal using herbal extracts.

II. MATERIALS AND METHODS:

Formulations Of herbal kajal:

Collection of plant materials:

Bhringraj leaves were collected from our college medicinal plant garden. Oranges were collected from local market. Cow ghee, mud diyas, white cotton cloth and rose water were purchased from local market. Methanol was purchased from SD fine chemical Limited,Mumbai.

Bhringraj:

Synonyms: Eclipta,bhangra,maka,wadelia

Biological Source: Obtained from whole plant of *EcliptaAlba* (L) Hassk

Family: Asteraceae(S.B.Ghokale *et al*.,)

Fig 1: Bhringaraj

Orange Peel:
Synonyms: orange cortex
Biological Source: Orange peel is dried or fresh outer part of the pericarp of the ripe or near ripe fruits of citrus *aurantium Linn.*
Family: Rutaceae. (S.B.Ghokale *et al*.,)

Fig 2: Orange peel

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.(S.B.Ghokale *et al*.,)

Fig 3: Coconut oil

Rose Water:
Synonyms: Gulab Jal, Rose Hydroso
Biological Source: Rose water is obtained by steam distillation of fresh rose petals, usually from *Rosa damascena, Rosa centifolia*, or other fragrant rose species.
Family: Rosaceae(S.B.Ghokale *et al*.,)

Fig 4: Rose water

Formulation of herbal kajal: After drying, leaves made powder by the use of mixer. The powders were dried and weighed. Both powders were extracted with methanol. The cotton cloth was soaked in different concentrations in mornings drying overnight. The process was repeated until the extracts were completely absorbed. The cotton cloth was made as wick and lighted in mud lamp containing 20ml of coconut oil and 2 drops of rose water. The black soot was collected in dry and porcelain dish. The powder was made as paste with the help of cow ghee and packed in dry box.(Sarita L. Sangale *et al*.,)

Table1: Formulation of herbal kajal

S.No.	Ingredients	F1	F2	F3	F4	F5	F6	F7
1	Bhringraj	19ml	10 ml	14 ml	16 ml	18 ml	26 ml	12 ml
2	Orange peel extract	12 ml	26 ml	18 ml	16 ml	14 ml	10 ml	19 ml
3	Coconut oil	20ml	20ml	20ml	20ml	20ml	20ml	20ml
4	Rose oil	2 drops	2drops	2 drops	2 drops	2drops	2 drops	2drops
5	Cow ghee	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.

Fig 5: Bhringraj Leaf extract

Fig 6: Fine powder

Fig 7: Extraction

Fig 8: Different concentrations of extractions

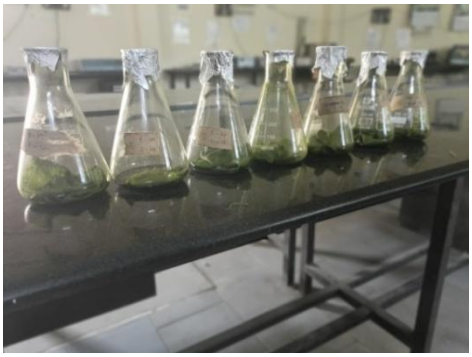

Fig 9: Cloth dipped in different concentrations of solutions Fig 10: Soaked cotton cloth

Fig 11: Drying of cotton cloths

Fig 12: Inverted plate placed on the lamp

Fig 13: Black soot deposited on steel plate

Fig 14: Formulations of kajal

Physical evaluation:

Colour & shape: Colour and shape was checked by naked eye.

Odour: The smell of formulation was checked by applying preparation on hand and feels the fragrance of perfume.

pH: The pH of the prepared soap was assessed by touching a pH strip to the freshly formulated soap and jointly by dissolving 1 gram in 10 ml water with the help of digital pH meter.[3]

Irritability Test:

A tiny amount of the product was applied to the skin and left for a few minutes and noted the irritability.

Spreadability: Excessive amount of kajal sample was taken in glass slides and the weight was placed on the slides for 5 minutes to press the kajal samples to the same thickness. Weight is added on pan. The time required to separate out two slides from each other was taken as a measure of the spread.

It was calculated using the formula.

S = M. L / t

Where M = the weight (g) tied to the upper glass slide

L =the length (cm) moved on the slide

t = time to separate the slide

III. RESULTS AND DISCUSSION:

The present study involves the formulation and evaluation of herbal kajals. Seven different herbal kajals were prepared by different concentrations of herb extracts. Different concentrations of orange peel extract and bhring raj leaf extracts were used for the formulation. The formulations were examined for the physicochemical properties, pH, IR, TGA, irritability and spreadability. All formulations showed better results. These formulations will be used for beatification purpose. Among the seven formulations formulation no.F1 and F2 are considered as best as it shows near to skin pH.

All formulations were black in colour, characteristic odour, smooth texture, and smooth consistency. No formulation experiences irritability. All formulations were stable for three months. All formulations possess spreadability ranges from 2.5 to 3.8.All formulations possess pH ranges 6.85 to 7.3.

IR spectrum of formulation F1: 3452.40(-OHhydrogen bonded,str),2923.92(-CH alkane,strt.),2853.05(-CH alkane,strt.),1745.65(C=O cyclic ketone,strt),1465.75(-CH_2 bend.)

IR spectrum of formulation F2: 3769.66(-OH, str), 3703.29(-OH,strt),3642.46(-OH,strt),2937.16 (-CHalkane,strt.),2868.40 (-CH alkane,strt.),1751.60(C=O cyclic ketone,strt),1467.44(-CH_2 bend.)
IR spectrum of formulation F3: 3472.03(OH- hydrogen bonded,str),3006.12(-CH.Aro,strt),2925.02(-CH alkane,strt.),2854.10 (-CH alkane,strt.),1746.43(C=O cyclic ketone,strt),1464.92(-CH_2 bend),1163.57(C-O-C,strt).
IR spectrum of formulation F4: 3465.14 (OH- hydrogen bonded,str), 3006.23(-CH,Arom,Strt),2924.52(-CH alkane,strt.), 2853.69(-CH alkane,strt.),1745.80 (C=O cyclic ketone,strt),1464.40(-CH_2 bend.),1377.32((-C-O-H,strt),1163.57(C-O-C,strt .)
IR spectrum of formulation F5: 3465.97 (OH- hydrogen bonded,str),3006.18(-CH,Arom,Strt.), 2924.39 (-CH alkane,strt.),2853.54 (-CH alkane,strt.),1745.98(C=O cyclic ketone,strt),1464.83(-CH_2 bend.),1377.33(b),1238.16(h),1163.49(C-O-C, strt).
IR spectrum of formulation F6: 3450.29 (OH- hydrogen bonded,str),30006.08(-CH,Arom ,strt), 2924.68 (-CH alkane,strt.),2853.71 (-CH alkane,strt.),1746.10 (C=O cyclic ketone,strt),1465.02(-CH_2 bend.),1377.49(-C-O-H,strt) ,1164.26(C-O-C, strt).
IR spectrum of formulation F7: 3466.64(OH- hydrogen bonded, str),3006.00 (-CH, arom.strt),2924.38 (-CH alkane,strt.), 2859.54 (-CH alkane,strt.),1746.10 (C=O cyclic ketone,strt),1465.26 (-CH_2 bend.), 1377.36 (-C-O-H, strt),1238.79 (-C=O, strt.),1163.58 (-C-O-C,strt).
The thermograms of formulation F2, F3 and F4 were showed that they were formulated as carbon black showing the degradation at 25^{O}C.
Thus, in this research work, the prepared poly kajals can be used as beauty regime which the exhibit satisfactory results. Hence, this study was concluded as the formulated herbal kajals can be used as for the beautification purpose.

Table2: Evaluation parameters of the herbal kajal

S. No.	Parameters	F1	F2	F3	F4	F5	F6	F7
1	Colour	Black	Black	Black	Black	Black	Black	Black
2	Odour	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic
3	Consistency	Smooth appearance	Smooth appearance	Smooth appearance	Smooth appearance	Smooth appearance	Smooth appearance	Smooth appearance
4	texture	smooth	smooth	smooth	smooth	smooth	smooth	Smooth
5	Irritability	No	no	No	no	no	No	No
6	Stability	stable	stable	stable	stable	stable	Stable	Stable
7	Spreadability	2.6	3.5	2.9	2.5	2.7	3.8	3.1
8	pH	7.2	7.2	7.3	7.25	7.35	6.85	6.9

IV. CONCLUSION:

Seven different kajal formulations were prepared by using different concentrations of bhring raj and orange peel extracts. The herbal kajal formulations prepared well and evaluated for the physicochemical properties, pH, IR, TGA irritability and spreadability. Among the F1nad F2 formulations are found better among them.

REFERENCES:

[1]. Sarita L. Sangale, Sanyukta S.Kute,Charushila J. Bhangale,(2023),Formulation and Evaluation of Herbal Kajal. *International Journal of Pharmaceutical Sciences*,01(07):302-5.
[2]. Pratiksha V.Varpe, Ganesh.M.Telangil, Mrunal.T.Wakale,Ankita .P.Jadav,Rahul Lokhande,(2022), "Formulation and Evaluation of Medicated Herbal Kajal", *International Journal of Scientific Research in Science and Technology*,9(3): 565-71.
[3]. Sangale Sarita L and Bhangale charushila J, (2023), Review on Herbal kajal. *International Journal of Innovative Science and Research Technology*, 8(3), 1046-50.
[4]. Khushi J. Popali and Shailju G. Gurunani(2024), Preparation and Evaluation Aspects of Herbal Kajal. *International Journal of Scientific Research in Science and Technology*,11(5): 418–25.
[5]. Text book of Pharamcognosy, S.B.Ghokale,C.K.Kokate,A.P.Purohit,Nirali Prakashan publications, p.15.87-88 and p. 14.20-21.
[6]. Polly Gupta, Shashank Tiwari, Shreyansh Pandey,Azaj Ahmad,(2024),Sacred eyes: Formulation and evaluation of Ficus religiosa herbal kajal,*International Journal of Scientific Research Updates*,08(02), 67–76.
[7]. D. Randive S.Bhinge,N. Jadhav,M.Bhutkar,M.Shirsat,(2020), Carbon Based Kajal Formulations: Antimicrobial Activity and Feasibility as a semisolid base for ophthalmics, *Journal of Pharmaceutical Research International*, 32(13), 62-74.
[8]. L.D. Kapoor, Handbook of Ayurvedic Medicinal plants. CRC Press, Washington, DC, 2001,p18–19.

[9]. J.P. Jani, C.V. Raiyani, N.M. Desai, S.K. Kashyap.(1988),Polycyclic Aromatic Hydrocarbons in Kajal and Surma Eye Cosmetic Preparations. *Human Toxicology*, *7* (2), 195-7.
[10]. Monica Garcia, Valldecabres, Antonio Lopez Alemany, Miguel F Refojo, (2004), pH Stability of ophthalmic solutions, *Optometry*, 75(03),161-8.
[11]. D.Randive.S.Bhinge.,N.Jadhav, M.Bhutkar,M.Shirsat,(2020),Carbon based Kajal Formulations:Antimicrobial activity and feasibility as a semisolid base for ophthalmics,*Journal of Pharmaceutical Research International*,32(13), 62–74.
[12]. S V. Gujar, S. S. Bhosale, S. G. Walunj and S. P. Paymode. (2023)A Review on Formulation and Evaluation of Herbal Kajal. *International Journal of Advanced Research in Science, Communication and Technology*,3(1), 81–88.
[13]. Pratiksha.V. Varpe, Ganesh. M. Telangi, Mrunal. T. Wakale, Ankita. P. Jadhav, Rahul. Lokhande,(2022), Formulation and Evaluation of Medicated Herbal Kajal. *International Journal of Scientific Research in Science and Technology*,9(3), 565–71.
[14]. Varpe P.V, Telangil G.M, Wakalel M.T, Jadhav A.P, Lokhande R, Formulation And Evaluation of Herbal Medicated Kajal,(2022),*International Journal of Scientific Research and Technology*, 9(3),565-71.
[15]. Waghulde S, Pawar A, Kadav M, Khade P, Kale M, Tekade B, Gorde N, Naik P, (2019). Formulation Development of a Patient Friendly Dosage Form for Eye Drug Delivery: Kajal, *Proceedings*, 9(1), 69.
[16]. Gupta R, Ahmad H, Sehgal S, Dwivedi H.(2016), Formulation, Preliminary Evaluation and Antimicrobial Activity of A Herb Based Kohl, *International Journal of Phytocosmetics and Natural Ingredients*, 3(5),1-5.
[17]. Sreelesh Brinda, Nesari Tanuja,(2015),Formulation, characterization and evaluation of herbal under-eye cream,*World Journal of Pharmaceutical Sciences*,3(3),542-52.
[18]. Michael TMW, Jennifer PC,(2018), *Investigating the Effect of Eye Cosmetics on the Tear Film: Current Insights. Clinical Optometry*.10, 33–40.
[19]. Fawzi Sweha(1982).Kohl a long history in medicine and cosmetics. *Histoire des Sciences Medicales*. 17(2), 182-3.
[20]. Hørven I. (1993), Acute conjunctivitis: a comparison of fusidic acid viscous eye drops and chloramphenicol. *Acta Ophthalmologica*,71 (2), 165-8.
[21]. Stenson S, Newman R, Fedukowicz H. (1982). Laboratory studies in acute conjunctivitis. *Acta Ophthalmologica*, 100(8),1275-7.
[22]. Ronnerstam R, Persson K, Hansson H, Renmarker K. (1985).Prevalence of chlamydial eye infection in patients attending an eye clinic, a VD clinic, and in healthy persons. *British Journal of Ophthalmology*.69(5), 385-8.