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FORMULATION AND EVALUATION OF BAUHINIA PURPUREA FLOWER HERBAL CREAM

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Abstract

Bauhinia purpurea, a plant belonging to the Fabaceae family and commonly known as the butterfly tree, is recognized for its extensive therapeutic potential. Its various phytoconstituents and extracts have demonstrated a broad spectrum of pharmacological activities, including antifungal, wound-healing, antidiabetic, antiulcer, antioxidant, antinociceptive, hepatoprotective, nephroprotective, antidiarrheal, anti-inflammatory, antipyretic, analgesic, antimalarial, gastroprotective, and cytoprotective effects. The objective of the present study was to formulate a stable and effective topical cream using a crude extract derived from Bauhinia purpurea flowers. The cream was prepared by incorporating the floral extract into a suitable cream base. The formulated cream was then subjected to a comprehensive evaluation to assess its physicochemical properties and stability. The evaluation results demonstrated that the prepared cream possesses very good characteristics, indicating its potential as a viable pharmaceutical or cosmeceutical product. This study successfully establishes a formulation for a cream of Bauhinia purpurea flower extract, providing a basis for further research into its therapeutic applications.

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Introduction

The word *cosmetic* is derived from the Greek word *kosmētikos*, meaning having the power to arrange or skill in decorating. The origin of cosmetics forms a continuous narrative throughout human history as they evolved over time. In prehistoric times (around 3000 BC), humans used colors for decoration to attract animals for hunting. They also colored their skin and adorned their bodies for protection and to provoke fear in enemies, whether human or animal. Thus, the origin of cosmetics was associated with hunting, fighting, religion, and superstition, and later became linked with medicine [1]. Herbal cosmetics, hereafter referred to as products, are formulated using various permissible cosmetic ingredients to form a base, in which one or more herbal ingredients are incorporated to provide defined cosmetic benefits only. Such products are referred to as Herbal Cosmetics.

A very valuable and significant component of India's traditional healthcare system is medicinal herbs. Ayurvedic medical systems, which place a strong emphasis on bioactive substances, have gained relevance recently on a global scale. A sizable population relies on herbal therapy to address their basic medical needs, which advances research on therapeutic herbs. Despite the availability of contemporary medications, plant products are favoured since they have fewer adverse effects. Numerous investigations have noted that a sizable population relies on the traditional medical system. One of them is the well-known plant Bauhinia purpurea (B. Purpurea), which has a wide range of therapeutic applications. It is a member of the Caesalpiniaceae family. About 15 of the more than 200 species in the genus Bauhinia were found in India. Some of them are shrubs or trees, while a few are climbers. Familiar name are Butterfly tree in English, purple orchid shrub, purple Bauhinia, Kaniar in Hindi, Devakanchan in Kannada, Raktachandan in Marathi [2].

ADVANTAGES [3]

- They don't provoke allergic reaction and don't have negative side effects
- They can easily penetrate into skin and hair.
- Extracts of plant decreases the bulk property of cosmetics and gives appropriate pharmacological effects.
- Easy to manufacture and cheap in cost.

Disadvantages

- Herbal drugs have slower effects as compared to allopathic dosage forms. Also it requires long term therapy.
- They are difficult to hide taste and odour.
- Most of the herbal drugs are not easily available.
- Manufacturing process are time consuming and complicated.
- No pharmacopoeia defines any specific procedure or ingredients to be used in any of herbal cosmetics.

Plant Description [4]

Plant materials: The flowers of Bauhinia purpurea was collected from our campus, Palamuru University. B. purpurea is a small tropical tree with fragrant pink flowers, pod fruit, and medicinal uses. It is native to China, India, and Southeast Asia, common in various regions. The plant has many medicinal applications, including treating dysentery, respiratory issues, and hemorrhoids. It is also used in dyeing, tanning, and for its astringent properties.The leaves are bilobed, broad, and 10-20 cm long. The flowers feature five petals and have laxative properties. Pushpa Gulakanda (flower jam) helps alleviate constipation. The bark extracts fibers and tannins. The roots treat hemorrhoids and goitre, while the whole plant addresses diarrhea, coughs, urinary disorders, and skin diseases.

Taxonomical classification

Domain- Eukaryotes
Kingdom- Plantae
Phylum- Spermatophyta
Subphylum- Angiospermae
Class- Dicotyledonae
Order- Fabales
Family- Fabaceae
Subfamily- Caesalpiniodeae
Genus- Bauhinia
Species- Bauhinia purpurea

Maceration Process

- Maceration is a straightforward technique whereby plant material is immersed in solvents.
- It is widely employed for the extraction of bioactive compounds from botanical sources.
- Nonetheless, this method presents certain limitations, such as suboptimal yield and potential health hazards associated with the use of solvents.
- The selection of an appropriate solvent is paramount for effective extraction.
- Additionally, minimizing particle size is essential for enhancing extraction efficiency.
- The mixture is subjected to agitation and subsequently filtered, with the overall efficacy hinging on both the solvent employed and the specific type of plant material.
- The polarity of the solvent significantly influences extraction efficiency.
- Various solvents, along with specific time-temperature combinations, are utilized to optimize the process.
- Maceration disrupts cellular structures, facilitating the release of plant components.
- This technique is employed for the extraction of bioactive compounds across both laboratory and industrial scales.

Preparation of Extract [5]

A wide-mouthed bottle or any suitably stoppered container is employed for the maceration process. A sealed vessel is imperative to avert the evaporation of the menstrum, which predominantly consists of concentrated alcohol. The container is meticulously washed and sanitized to eliminate any risk of contamination. Fifty grams of the crude drug are introduced into the container, followed by the addition of a sufficient quantity of solvent or menstrum, specifically methanol. This mixture is stirred thoroughly, after which the vessel is securely closed and set aside at ambient temperature for duration of 24 hours.

During this period, it is imperative to stir or agitate the contents at various intervals. Upon completion of the 24-hour period, the mixture is subjected to filtration, and the marc is subsequently pressed. The marc is then reintroduced into the container, to which an adequate amount of solvent is added. This mixture is again stirred and left to rest for another 24 hours. The process is reiterated, with stirring occurring at different time intervals. After five days, the mixture is filtered once more.

The resulting filtrate is allowed to evaporate, ultimately yielding a semi-solid residue known as the "Extract."

Phytochemical Constituents [4]

B. purpurea reported for the presence of various phytochemical constituents. It contain glycosides, saponin, phenolic compounds, tannins, flavonoids, fixed oils, fats, proteins, flavones glycoside, fatty acid, Journal of Ayurvedic and Herbal Medicine to copherols, cardiac glycosides, carbohydrates, alkaloids, sterol, steroids, flavanones, lutein, beta sitosterol etc

Phytochemical analysis of extract

Table 01: Phytochemical analysis of extract

Test	Procedure	Positive Result
Molisch's test	To the extract added few drops of alcoholic alpha naphthol solution followed by few drops of concentrated sulphuric acid along the sides of the test tube.	Purple or violet colored ring formed at the junction
Fehling's test	To the extract added equal amount of Fehling's A and B solution, heat the tubes in a boiling water bath.	Brick red precipitation of cuprous oxide formation
Benedict's test	To the extract added Benedict's reagent and the contents in the tubes were heated in a boiling water bath.	Formation of red precipitate
Wagner's test	To the extract added few drops of iodine solution in potassium iodide.	Reddish brown precipitate
Hager's test	To the extract added few drops of saturated solution of picric acid.	Yellow color precipitation
Libermann-Burchard test	To the extract added 2ml chloroform, 10 drops of acetic anhydride, 2 drops of concentrated sulphuric acid.	Formation of bluish red to cherry red color in chloroform layer
Salwoski test	To the extract, few drops of chloroform were added followed by concentrated sulphuric acid.	Presence of bluish red to cherry red color
Legal test	To the extract added pyridine and sodium nitroprusside.	Pink to red color formation
Baljet test	To the extract added picric acid.	Appearance of orange color
Foaming test	Foams produce when the extract was mixed with water.	
Shinoda test	To the extract added magnesium turnings, 1-2 drops of concentrated hydrochloric acid.	Appearance of red color
Zinc hydrochloride test	To the extract added zinc dust, 1-2 drops of concentrated hydrochloric acid.	Appearance of red color
Ferric chloride test	To the extract added ferric chloride.	Appearance of greenish black color
Potassium dichromate test	To the extract added potassium dichromate solution.	Formation of brown precipitate
Gelatin test	To the extract added 1% gelatin solution containing 10% sodium chloride.	Formation of white precipitate
Biuret test	To the extract added 4% sodium hydroxide followed by few drops of 15% copper sulphate.	Appearance of purple color
Ninhydrin test	Bluish violet color was formed when a solution of ninhydrin was added to the extract and heated.	

Antimicrobial effect [6]

The present study evaluated the development of the medicinal plant B. purpurea which exhibited antibacterial activities against two Gram-positive bacteria (S. aureus and B. subtilis). The mechanism of antimicrobial activity is complicated and could be attributed to synergism between flavonoids, hydroxy acids and sesquiterpenes . Flavonoids are the largest group of secondary metabolites in plants. Flavonoids exhibit antimicrobial activity through formation of a complex with the bacterial cell wall. They also possess antioxidant activity due to presence of a phenolic ring in the moiety.

Antioxidant activity [7]

It explored as well as compared the antioxidant activity of the different plant parts of B. purpurea Linn, 1,1-diphenyl-2- picrylhydrazyl (DPPH) free radical scavenging and nitric oxide (NO) scavenging capacity were a measure to determine the antioxidant activity of both leaves and bark of the plant. Solvent-solvent partitioning was accomplished to obtain extracts of different polarities as n-hexane, ethyl acetate, and methanol extract. All the extracts exhibited potent antioxidant activity in terms of DPPH and NO scavenging capacity[8].

Anti-inflammatory activity

It reviewed a large group of medicinal plants including B. purpurea which were used as traditional medicine and had the potential to cure various diseases. Various models tested for anti- inflammatory activity. Carrageenan, Histamine, Dextran, Serotonin, induced hind paw edema, cotton pellet induced granuloma Freund's Adjuvant were the standard experimental models of acute and sub-acute and chronic inflammation respectively. The test phytodrugs were effective in all the models of inflammation.

Material and Methods

Cream Formulation[i]

Cream is prepared by using Fusion method. Polysorbate 20 and glycerin was taken in first beaker. Then heat on a water bath. After few minutes oil phase was formed. Hydroalcoholic flower extract, Distilled water, Beeswax, Borax, Liquid paraffin, Rose oil, were taken in second beaker. Mixing all the ingredients by heating on a water bath, the aqueous phase was formed. Oil phase was added into aqueous phase and contious stirring was to be done until semisolid mass was formed.

Table 02: Ingredients used for the formulation of Cream

S.NO.	INGREDIENTS	QUANTITY
1	Flower extract	10ml or 10grams
2	Liquid paraffin	20ml
3	Bees wax	4.86 grams
4	Borax	0.34 gm
5	Polysorbate 20	0.8gm
6	Glycerin	2.5 grams
7	Rose oil	Quantity sufficient
8	Distilled water	Quantity sufficient

Liquid paraffin: It adds moisture and continues to boost moisture levels once the treatment is complete. It also helps open pores and remove dead skin cells, making the skin look freasher and smoother.

Beeswax : In manufacturing, yellow and white beeswax are used as thickeners ,emulsifiers, and as stiffening agents in cosmetics.

Borax : In cosmetic products ,borax is sometimes used as an emulsifier, buffering agent, or preservative for moisturing products .

Polysorbate 20: It is a type of oily liquid ingredient that is used in the cosmetic industry because it acts as an emulsifier and helps bind oil and water together.Polysorbate 20 is a ploysorbate-type non-ionic surfactant formed by the ethoxylation of sorbitan monolaurate.

Glycerine: It is used safely in numerous cosmetics and personal care products such as soaps and skin /hair care products to provide smoothness and lubrication .It is also a well-known humectants that prevents loss of moisture from products so they don't dry out as quickly

Rose oil: It gives fragnance and pleasant odor. This oil minimises the appearance of wrinkles, fine lines, and age spots.

Evaluation of Cream [5, 9]

Physical Evaluation

Formulated herbal creams was further Evaluated by using the following physical parameter like colour, odour, consistency, and state of the formulation.

a) Colour: The colour of the cream was observed by visual examination.

b) Odour: The odour of cream was found to be characteristics. c) State: The state was cream was examined visually. The cream was solid in state.

d) Consistency: The formulation was examined by rubbing cream on hand manually. The cream having smooth consistency.

e) pH: pH of prepared herbal cream was measured by using digital ph meter. The solution of cream was prepared by using 63.3 ml of Distilled water and set aside 2hrs. pH was determined three times for solution and the average value was calculated.

f) Spredability: Spreadability of formulated cream was measured by placing sample in between two slides then compressed to uniform thickness by placing a definite weight for defined time. The specified time required to separate the two slides was measured as Spredability. Lesser the time taken for separation of two slides results showed better Spredability. Spredability was calculated by the following formula

$$S = \frac{\text{Weight tide to upper slide (W) x Length of glass slide (L)}}{\text{Time taken to separate slide (T)}}$$

g) Washability: Formulation was applied on the skin and then ease extends of washing with water was checked.

h) Non- irritancy test: Herbal cream formulation was evaluated for the non-irritancy test. Preparation shown no redness and irritancy. Observation of the state was done for 24 hrs.

i)Viscosity- Viscosity of cream was done by using Brooke field viscometer at the temp of 25 Degree c. using spindle no, 6.at rpm.

J) Phase separation- The prepared cream was transferred in a suitable wide mouth container. Set aside for storage the oil phase and aqueous phase separation were visualizing after 24h..

K) After feel: Emolliency slipperiness and amount of residue left after the application of the fixed amount of cream was found to be good

Result

The present study was the formulation and evaluation of herbal cream. This cream formulation was o/w type of emulsion; hence this formulation was easily washed with water after application. The prepared formulation has good spreadability,Viscosity and pH. Cream does not show any type of phase separation during storage. The cream was non- greasy in nature and easily removable after application. The formulation was Non-irritant.

Table 03: Phytochemical analysis result of extract

NAME OF THE TEST	RESULTS
Test for carbohydrate	+++
Test for alkaloid	++
Test for steroid and sterol	++
Test for Glycoside	+++
Test forsaponin	++
Test for flavonoid	+++
Test for tannin and phenolic compound	+++
Test for protein and amino acid	+

Table 04: Evaluation results of Cream

S.NO.	PARAMETER	RESULTS
1	Colour	Purple
2	Odour	characteristic
3	State	Semisolid
4	Consistency	Smooth
5	PH	7.3-7.6
6	Spredability	7.4 g.cm/sec
7	`Washability	Easy Washable
8	Non-Irritancy test	Non-irritant
9	Viscosity	2112cps
10	Phase separation	No separation
11	After feel	Emollient

Conclusion

Formulation of cream was done by fusion method and evaluated for various evaluation parameters such as physical properties, pH, Spreadability, Washability, nonirritancy test, viscosity and phase separation of cream and shown good results.

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Not Declared

Conflicts of Interest

The author declares no conflicts of interest.

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Ethical Considerations

Not Applicable

Informed Consent

Not Applicable

References

1. Roy, J., A. Pal, and S. Chakraborty, *Herbal Creams: An Overview.* International Journal of Health Sciences and Research, 2024. 14(7): p. 136–144.
2. *Muralikrishna KS, Latha KP Sridhara CS,Vaidhya VP and Krupanidhi AM; Effect of Bauhinia purpurea Linn.*
.3. Kumar, D., et al., *Herbal cosmetics: An overview.* International Journal of Advanced Scientific Research, 2016. 1(4): p. 36–41.
4. Boonphong, S., et al., *Bioactive Compounds from Bauhinia purpurea Possessing Antimalarial, Antimycobacterial, Antifungal, Anti-inflammatory, and Cytotoxic Activities.* Journal of Natural Products, 2007. 70(5): p. 795–801.
5. Shahu, K. and S. Prajakta, *Formulation and Evaluation of Vanishing Herbal Cream of Crude Drugs.* Asian Journal of Pharmaceutical Research and Development, 1970. 8(3): p. 66–69.
6. Gaur, P.K., et al., *Polyherbal Antiacne Gel: In Vitro Antibacterial Activity and Efficacy Evaluation Against Cutibacterium acnes.* Assay Drug Dev Technol, 2024. 22(7): p. 373–386. *<ocimum herbal face cream.pdf>.*
8. Kawarkhe, P.R., S.V. Deshmane, and K.R. Biyani, *Formulation and evaluation of antioxidant face cream containing raspberry fruit and grape seeds extract.* Research Journal of Topical and Cosmetic Sciences, 2016. 7(2).
9. Bhavani, M.S., et al., *Formulation and Evaluation of Herbal Face Cream.* International Journal of Pharmaceutical Sciences Review and Research, 2023. 83(2).