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Characterization and development of anti aging Cream by using Bakuchiol extract

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ABSTRACT :

The creation and assessment of an anti-aging cream enhanced with Bakuchiol extract—a phytochemical obtained from Psoralea corylifolia that has retinol-like activity and skin- rejuvenating properties—are the main topics of this review. The cream was created with natural elements including glycerine, jamul powder, neem oil, and essential oils to improve its anti- inflammatory,moisturising, and antioxidant qualities. Through physicochemical,microbiological, and stability studies, three formulations (F1, F2, and F3) were evaluated; F3 demonstrated the best results in terms of pH, spreadability, viscosity, homogeneity, and user acceptability. The phosphomolybdenum assay was used to measure the antioxidant capacity of Bakuchiol extract, demonstrating its effectiveness in scavenging free radicals. Overall, this formulation shows how plant-based components can be used as safe and efficient substitutes for synthetic anti-aging compounds in cosmeceutical products.

Keywords: Skincare, natural cosmetics, antioxidants, herbal formulation, anti-aging cream, and Bakuchiol Extract.

Introduction Skin :-





The largest organ in the body, the skin is composed of minerals, water, protein, and lipids. Your skin controls body temperature and shields your body from pathogens. You may feel warmth and cold thanks to nerves in your skin.Your skin is a component of the integumentary (in-TEG-you-MEINT-a-ree) system, which also includes your hair, nails, or sweat glands. "Integumentary" refers to the outermost layer of a body. The largest organ in the body, the skin is composed of minerals, water, protein, and lipids. Your skin controls body temperature and shields your body from pathogens. You may feel warmth and cold thanks to nerves in your skin. Your skin controls body temperature and shields your body from pathogens. You may feel warmth and cold thanks to nerves in your skin is a component of the integumentary (in-TEG-you-MEINT-a-ree) system, which also includes your hair, nails, or sweat glands. "Integumentary" refers to the outermost layer of a body.

Problems related to skin :-

Wrinkles :-

A natural part of aging, can also be caused by sun exposure, smoking, and other factors, leading to a variety of issues like premature aging, skin damage, and potential skin cancer risks.

Skin Ages :-

It gets thinner, more delicate, and more vulnerable to a number of issues, including dryness, wrinkles, age spots, and a higher risk of infections and skin cancer.

Dry Skin :-

Rough, itchy, and even cracked skin are common symptoms of dry skin, which can cause pain, discomfort, and an increased risk of infection.

Acne :-

Common skin conditions like acne can cause a number of issues, such as uncomfortable pimples, inflammation, and in more extreme situations, scars and psychological discomfort.

Pigmentation:-

Genetics, sun exposure, and some drugs are the three main causes of skin pigmentation.Damage to cellular DNA and proteins causes a continuous deterioration process that leads to skin aging.

Skin aging is a common and predictable process that is defined by changes in the way the skin operate physiologically. Dry, pale skin with wrinkles is the result of keratinocytes' inability to produce a functioning stratum corneum and a slowed rate of creation from neutral lipids as we age. Plants and herbs can be used as a supplemental medicine tool. By lowering skin conditions, cosmetics use contributes to both a longer lifespan of good health and the development of an attractive outward look. The natural or synthetic components found in skin care products that promote skin health, texture, and integrity, moisturize, preserve skin elasticity by lowering type I collagen, and provide photoprotection. Cosmetics helps in the long-term management of skin characteristics and the reduction of free radical generation in the skin.

MATERIAL AND METHODS

Preparation of Bakuchiol Extract

Babchi seeds (Psoralea corylifolia) were first ground into a fine powder and allowed to dry in the shade in order to create Bakuchiol extract for an antiaging lotion. 500 ml of ethanol or a 50:50 ethanol-water mixture was used to soak 100 g of the powder. For three to five days, the mixture was stored in a sealed container in a cool, dark location and shaken periodically. Following the maceration period, the mixture was filtered, and a concentrated extract rich in Bakuchiol was obtained by evaporating the solvent at a low temperature (below 50° C). The extract was utilised in cream formulations at a concentration of 0.5–2% and kept in a dark bottle.

Determination of Total Antioxidant Capacity

The phosphomolybdenum assay was used to measure the aqueous and ethanolic extract's overall antioxidant capability, based on the Mo (VI) is reduced to Mo (V) by the extract, and in an acidic environment, a green phosphate-Mo (V) complex is then formed. One millilitre of the reagent solution (0.6 molar sulphuric acid, 28 mM sodium phosphate, and 4 mM ammonium molybdate) was mixed with 0.1 millilitres of each extract. The reaction mixture was incubated at 95oC FOR 90 min. after cooling to room temperature, the absorbance of the solution was measured at 695 nm using a UV visible spectrophotometer, 0.1ml methanol was used as the blank. The total antioxidant capacity was expressed as the number of gram equivalent of ascorbic acid per ml of extract.

Cream Formulation

Table 1provides the cream formula Glycerine water is mixed with a binder or polymer substance to create a liquid dispersion and display slightly swelling property. This liquid dispersion is added to the Bakuchiol Extract. To the mixture base and oils are added. Finally other ingredients like skin whitener and preservatives were added with continuous mixing.

Table 1.Formula for Cream

Ingredient	Category	F1	F2	F3
Bakuchiol	Anti-aging	1ml	1ml	1ml
Extract				
Neem oil	Antioxidant	0.5ml	0.5ml	0.5ml
Eucalyptus oil	Soothing +antiseptic	0.5ml	0.5ml	-

Jamul powder	Detoxifier + Astringent	1 gm	1gm	1gm
Glycerine	Moisturized	0.5ml	0.5ml	1ml
Propylene	Moisturized +binder	0.5ml	0.5ml	1ml
glycol				
Zinc oxide	Skin whitener	0.5ml	0.5ml	0.5ml
Ethyl cellulose	Polymer	1 gm	-	-
Bees wax	Base	0.45gm	0.45gm	-
Grape seed oil	Base	-	-	0.45gm
Almond oil	Base	-	-	-
Methyl Paraben	Preservative	0.1gm	0.1gm	0.1gm
Rose oil	Flavoring agent	-	-	0.5ml

EVALUATION OF CREAM

a) Organoleptic evaluation

The resulting cream's organoleptic qualities, including colour, odour, and condition, were assessed. The cream's look was evaluated based on its graded, colour, and roughness. The outcomes are shown in Table 2.

Sr.no	Specification	Limits
1	State	Semisolid
2	Color	Pinkish White
3	Odor	Characteristic
4	Texture	Smooth

Table2.	Organo	leptic	Prope	erties
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b) Test for microbial growth in cream

Using the streak plate method, the produced creams were incubated on Muller Minton agar media plates, and a control was made by omitting the cream. After being prepared, the plates were placed in the incubator and left there for twenty-four hours at 37°C. Following the incubation period, the plates were removed, and the microbial growth was examined by contrasting it with the control. Results are listed in Table 3.

Fable3.	Microbial	Growth in	Cream

Microbial load	Limits	Results
TMC	NMT 100	75
Limit test: E. coli, S.aureus, Salmonella	No characteristic colonies	Complies

NMT- Not more then, TMC- Total microbial count

c) Stability studies

Drug product stability testing starts during the drug discovery process and concludes when the chemical or commercial product degrades. Stability studies were conducted in accordance with ICH recommendations to evaluate the stability of the medication and formulation. For two months, the cream in the container was stored in a humidity chamber at 30 ± 2 oC/65 $\pm5\%$ RH and 40 ± 2 OC/75 $\pm5\%$ RH. Samples were examined for physical characteristics and viscosity at the conclusion of the studies.

Formulation	рН	Color	Viscosity at20rpm(cps)
F1	6.4	Off white	585
F2	6.0	Yellowish white	590
F3	5.7	Pinkish white	630

Table4. Stability Studies for Cream

d) pH of cream

The standard buffer solution was used to calibrate the pH meter. After weighing and dissolving roughly 0.5g of the cream in 50.0ml of distilled water, the pH was determined.

e) Spreadability studies

A crucial requirement for semisolids is that they have good spreadability, which is defined as the amount of area that the cream spreads readily when applied to the skin; the therapeutic efficacy of a formulation is also dependent on its spreading value. Spreadability is measured in seconds, with the formulation being placed between two glass slides with a specific load applied; the less time it takes for the two to separate, the better the spreadability. Two glass slides of standard dimensions were chosen, and the formulation whose spreadability needs to be calculated was placed over one of the

slides. The other slides was placed on the top of the formulation was sandwich between the two slides across the length of 5cm along the slide. 100gm weight was placed upon upper slides so that the formulation between the two slides was pressed uniformly two creates a thin layer. The weight was taken off, and the substance that was stuck to the slides was scraped off. The formulae were put on one of the slides that was fastened. Over it was the second movable slide, one end of which was fastened to a string that allowed load to be applied with the aid of a pan and a basic pulley. The time it took for the upper slide to move 5 cm and separate from the lower slides under the weight's direction was recorded after a 30 gram was placed on the pan. The spreadability was then calculated form the following formula, Spreadability = $m \times l/t$ m- Weight tied to the upper slide (30gm) l- Length of glass slide (5cm) t- Time taken in seconds Results are listed in Table 5.

f) viscosity

The viscosity measurements were done by using Brook field DV- II + viscometer using LV-4 spindle. The developed formulation was poured into the adaptor of the viscometer and the angular velocity increased gradually from 0.5 to 20rpm.

g) homogeneity

The formulations were tested for the homogeneity by visual appearance and by touch.

h) After feel

Following the application of a predetermined quantity of cream, the amount of residue left, emolliency, and slipperiness were assessed.

i) Removal

The ease of removal of the cream applied was examined by washing the applied part with tap water.

j) J) Irritancy test

Mark an area (1sq.cm) on the left hand's dorsal surface. The cream was applied to the specified area and time was noted. Irritancy, erythematic edema was checked if any for regular interval up to 24 hours and reported.

RESULT

a) Antioxidant capacity

In the p-resent study, the total antioxidant potential of the ethanolic and aqueous leaf extract was found as 2.26 and 1.06 mg ascorbic acid equivalent per ml of the extract respectively.

b) pH of cream

The pH of the cream was found to be in range of 5.6-6.8 which is good for skin pH. All the formulations of cream were shown pH nearer to skin required that is pH of F1- 5.8, F2-6.0, F3-6.5

Table5. pH of Cream

Formulation	рН
F1	6.4
F2	6.0
F3	5.7

c) viscosity

Viscosity of cream was in the range of 500-1000 cps which indicates that the cream is readily spreadable by small amount of shear. F3 show good spreadable property than other formulations.

d) Homogeneity

All formulations produced uniform distribution of extract in cream. This was confirmed by visual appearance and by touch.

e) After feel

Emolliency, slipperiness and amount of residue left after the application of fixed amount of cream was found good. f) Removal The cream of F3 on skin was easily removed by washing with tap water.

f) Removal

The cream of F3 on skin was easily removed by washing with tap water.

g) Irritancy test

The formulation F3 shows no redness, edema, inflammation and irritation during irritancy studies. These formulations are safe to use for skin.

h) Appearance

When formulations were kept for long time, it found that no change in color of cream.

CONCLUSION

The result mentioned above indicates that the Bakuchiol Extract leaves has a multipurpose effect on the skin, including whitening, anti-aging, antiwrinkle, and sunscreen effects. Since we know that a single plant extract's medicinal and cosmetic properties cannot be increased, we combined the extract of Bakuchiol extract, Neem oil, and Jamul powder to enhance and synergize the prepared product's cosmetic properties in comparison to the extract alone. This review focusses on the effective creation and testing of a natural anti-aging cream that uses Bakuchiol extract and is backed by additional herbal ingredients including glycerine, neem oil, and jamul powder. F3 outperformed the other evaluated formulations in terms of antioxidant activity, skin friendliness, stability, and spreadability. The study confirms that Bakuchiol can be a promising natural substitute for synthetic retinoids due to its demonstrated effectiveness in lowering ageing symptoms and improving skin health. A multipurpose cosmetic formulation with anti-aging, moisturising, antibacterial, and skin-soothing properties was produced by combining several herbal ingredients, which had synergistic benefits. This work opens the door for more research and development in herbal skin care products and supports the growing interest in plant-based cosmeceuticals.

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