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Anti Aging Multi Herbal Cream: A Research

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Abstract

According to studies, continuous deterioration process is the result of skin aging because of protein & cellular DNA damage. The main purpose of this work is to formulate an anti-aging herbal cream by using natural ingredients. The natural ingredients are pomegranate, curcuma longa, amla, hibiscus, green tea, vitamin E, coconut oil, olive oil, aloe vera, basil oil, mint oil. Oil based cream is formulated using natural ingredient. The creams were created in various concentrations, ranging from F1 to F4.During stability trials, the creams was stable according to ICH criteria. For 1 month, 30± 20C / 45±5 percent RH and 40±20C / 75±5% RH were used. It can be determined that multi-herbal creams are beneficial with multiple effects and excellent spreadability and minimal irritancy.

Keywords: Anti Aging, Natural Ingredients, Oil Base Cream, Multi Purpose.

Introduction

We use a range of cosmetics to tone up our skin and minimize wrinkles, blackheads, acne, pimples, and other indicators of aging since we all want to seem young and appealing. [1] Damage to cellular DNA and proteins is the main cause of the deterioration process that results in ageing skin. Sequential skin aging and photoaging are the two types of skin aging.

Sequential aging of the skin is a universal and predictable process because it alters the skin's physiological characteristics and function. The stratum corneum postpones the production of neutral lipids during the aging process, leading to dry, pale skin and wrinkles because there is insufficient keratenocyte synthesis in the skin layer. On the other hand, excessive UV exposure results in photoaging. Elasticosis and heliodermatitis, together with a random mixture of dermal and epidermal sections, are the causes of photoaging, which is characterized by dry, pale skin, shallow skin, fine wrinkles, and deep furrows.

Cosmetics are applied to the skin to improve its appearance and appeal while shielding it from external and internal pollutants. In addition to helping us grow, cosmetics are used to treat a range of skin disorders and to give us a beautiful appearance. Natural components in skin care products preserve skin elasticity by reducing type I collagen and provide UV protection, while also improving the skin's health, texture, and moisture content. Natural ingredients in cosmetic preparations help to shield the skin from damage for extended periods of time by inhibiting the production of free radicals in the skin. Using cosmetics is the best option for lessening the appearance of skin conditions like tan lines, wrinkles, hyper pigmentation, rough skin, and acne.

The market for herbal cosmetics is growing quickly despite the availability of numerous synthetic cosmetics that are just as effective but have a number of unfavorable side effects that have consumers worried about their health. [2]

Table 1: Formulation of Cream (25 gm)

Ingredients	F1(ml)	F2(ml)	F3(ml)	F4(ml)
Alovera oil	4	3	2	1
Pomegranate oil	1	1	1	1
Curcuma longa oil	2	2	2	2
Vit. E oil	2	2	2	2
Olive oil	1	1	1	1
Amla oil	1	1	1	1
Hibscus oil	2	2	2	2
Tulsi oli	1	1	1	1
Greentea oil	1	2	3	4
Mint oil	1	1	1	1
Coconut oil	2	2	2	2
Beeswax	7g	7g	7g	7g

The formulation studies were carried out according to the formula in table.The formulation containing as Curcuma longa , pomegranate , Aloe vera , Vitamin E, Amla Oil, Green Tea oil, Coconut Oil, Hibiscus oil, Olive oil, Tulsi oil, Mint oil

- Heat beeswax in a borosilicate glass beaker at 70℃ and maintain that heating temperature.
- Add other ingredients one by one with continuous stirring.
- Add mint oil just before filling of formulation in a suitable container.
- Then after mix mint oil fill the formulation in a container and allow it to cool.

Herbal Ingredients Used In Anti-Aging Face Care

1. Hibiscus: [4-6]

Botanical Name –Hibiscus rosa

Family – Malvaceae

Chemical Constituents –Tannins, Anthraquinones, Quinines, Phenols, Flavanoides, Alkaloids, Terpenoids, Saponins, Cardiac glycosides, Protein, free amino acids, Carbohydrates, Reducing sugars, Mucilage, Essential oils and steroids.

Uses - Anti-aging, Wound healing,

2. Curcuma longa: [7-11]

Botanical Name – Curcuma longa

Family – Zingiberaceae

Chemical Constituents – Curcumin, Carbohydrates, Essential Oil, Demethoxycurcumin, fats, dietry fibers, proteins, bisdemethoxycurcumin.

Uses - Heal wounds, Brighten dark circle,Treat inflammation,Treats eczema & psoriasis,Reduce acne scaring

3. Green tea: [12]

Botanical Name – Camellia Sinensis

Family –Theales

Chemical Constituents – Vit. (B, C & E) ,Enzymes & peptides, Glucose, sucrose, fructose, pectin and cellulose, Caffeine, Theophylline, Chlorophyll, Carotenoids.

Uses - Catechins help in anti-aging, Prevent skin redness

4. Amla: [13 14 15]

Botanical Name – Phyllanthus embilca

Family – Euphorbiaceae

Chemical Constituents –tannins, alkaloids, phenols, proteins, fats, calcium, nicotinic acid, fibres, iron, mineral matter, phosphorous, vitamin C, carbohydrate.

Uses - anti-inflammatory, free radicals.

5. Olive Oil: [16 17 18]

Botanical Name – E. Oleaster

Family – Oleaceae

Chemical Constituents – Triglycerides, Di and mono glycerides, hydrocarbons, Pigments, sterols, polyphenols, tocopherols, volatile compounds, triterpene acid.

Uses - anti-aging antioxidant, healing of injured skin tissues, It revitalises and enhances the tonicity of the skin, It help to remove sun tan.

6. Vitamin: [19 20 21 22]

Vitamin E is obtain mainly from plant, so dietary source are the important source through which we receive vitamin E. Nuts, whole grains spinach, sunflower oil, and olive oil are the best sources.

IUPAC Name - (2*R*)-2,5,7,8-Tetramethyl-2-[(4*R*,8*R*)-4,8,12-trimethyltridecyl]-3,4-dihydrochromen-6-ol

Mol. Formula - $C_{29}H_{50}O_2$

Mol. Weight - 430.7 g mol^{-1}

Uses - Wrinkles and fine lines are prevented, Used for moisturizing skin, It protects from sunburn, Act in wound healing, Useful in skin cancer prevention, Relieve itchiness on the dry skin, It also treats eczema and psoriasis

7. Piper Mint: [23 24]

Family: Labiatae

Botanical name:Menthapipertia L

Chemical constituents: Menthol, Menthone, Menthyl acetate, Menthofuran, 1,8-cineol, Limonene, Pilegone, Caryophyllene, Pinene, Eriocitrin, Hesperidin

Uses: It reduces pimples, cools skin and scalp, stimulates blood flow, regulates sebum and anti-inflammatory effect.

8. Pomegranate:[25 26 27]

Family: Lythraceae

Botanical name: Punica granatum

Chemical Constituents: Anthocyanins, Quercetin, Gallic acid, Asistic acid, Rutin, Punicicacid,Flavones, Punicalin.

Uses: It has anti-aging properties, improve skin tone, calming effect on the skin, It is great for sun bunnies, provide a fresh and revitalized appearance, It moisturize the skin.

9. Aloe Vera:[27]

Family: Liliaceae

Botanical Name: Aloe barbadensis miller

Chemical Constituents & Active Components: Vitamins – Vit-A,C,E,B1, B2,B6 and B12, **Enzymes –** Aliiase, amylase, oxidase, catalase, lipase**, Minerals –** Calcium, copper, potassium selenium,chromium, **Sugars –** Glucose, polymannose, alprogen,, **Organic Acids –** salicylic acid sorbate, **Anthraquinones** -Aloin, anthranol, emodin. **Fatty acids & Steroids –** Beta-sisosterol, Lupeol, cholesterol, **Non-essential aminoacids –** Arginine, glycine, alanine, **Essential aminoacids –** Methionine, leucine, lysine, **Hormones –**Auxins, Gibberellin.

Uses: Anti aging, Anti fungal, Anti oxidant, Wound healing, Anti inflammatory, moisturize the skin.

10. Coconut Oil: [28]

Family: Arecaceae

Botanical Name: Cocosnucifera (L.)

Chemical Constituents: Saturated fats ; Lauric acid (45% to 52%), Myristic acid (16% to 21%), Palmitic acid (7% to 10%), Caprylic acid (5% to 10%), Capric acid (4% to 8%), Stearic acid (2% to 4%), Caproic acid (0.5% to 1%), Palmitoleic acid (in traces)

Unsaturated fats: Oleic acid (5% to 8%), Linoleic acid (1% to 3%), Linolenic acid (up to 0.2%)

Uses: Wound healing, Antioxidant, Dermatitis, Anti-fungal, Anti inflammatory

11. Tulsi: [29 30]

Family: Lamiaceae

Botanical Name: Ocimum sanctum

Chemical Constituents & Active Components: Eugenol, methyl eugenol, carvacrol, sesquiterpine hydrocarbon caryophyllene, cirsilineol, rosameric acid, isothymusin, curcimaritin, apigenin.

Uses: Act against aging, Cleanses the skin thoroughly, Used as acne treatment, Helps in lightning is skin tone, Antiviral, antifungal, antibacterial, antitubercular, and antimalarial activities are all present in it.

Optimization of Base formulation

- **Physical evaluation of preparation**

The formulae were visually assessed for appearance, consistency, colour, and odour of each base formulation. Consider as + Poor, ++ Good, +++ Better to select the most stable base formulation.

Sn.	Parameter	F1	F2	F3	F4
1	Appearance	AA	A	AA	AAA
2	Consistency	AA	AA	AAA	AAA
3	Odour	AA	A	AA	AA

Table 2

Abbreviation: Poor = A, Good = AA, Better = AAA

Discussion: Based on the preceding table, it was observed that the formulation F4 has no changes in color, consistency, or odour.

- **Determination of pH**

Apperatus include a beaker, a pH metre, a stirrer, and a wash bottle.

Procedure: A standard buffer sol was used to calibrate the pH metre. The pH of the cream was determined at 27^{o}C after 0.5 g of the cream was measured and mixed in 50 ml distilled water. A standard buffer sol was used to calibrate the pH metre. The pH of the cream was determined at 27^{o}C after 0.5 g of the cream was measured and mixed in 50 ml of distil water

- **Determination of viscosity**

Brookfield viscometer, beaker, thermometer, and wash bottle are some of the **apparatus** used.

Procedure: A 100 gm sample of each formula was weighed and transferred to a beaker, where the viscosity of the formulation was evaluated using a Brookfield Viscometer (DV II+ Pro model) with spindle number S64 at 20 rpm at 25^{o}C.

Evaluation of Anti-aging herbal skin cream

a) Physical evaluation of the formulation

The compositions were visually assessed for colour ,appearance, and odour.

b) Measurement of pH

A pH metre was used to monitor the pH, which was calibrated with standardized buffer solutions of pH 4, 7, and 9 before each usage. At room temperature, the electrode was put in sample 10 minutes before the measurement was taken.

c) Viscosity

A Brookfield Viscometer was used to test the viscosity of the compositions (DV-I PRIME, USA). The gels were spun at three different speeds: 0.3, 0.6, and 1.5 revolutions per minute. The gel's viscosity was calculated by multiplying the matching dial reading by the factor specified inside the Brookfield Viscometer handbook.

d) Spreadability

When two slides are placed in between them then under direction of a given force, the time it takes for them to slip off the gel is measured in seconds. The extra sample was put between both the two glass slides, and a certain amount of load was applied to these glass slides in order to compress them to a consistent thickness. A 70-gram weight was added, and the time it took to distinguish two slides was recorded. The formula for calculating spreabability was used.

S = M.L / T, where M is the weight attached to the top slide, L is the length of the glass slides, and T is the time it took to split the slides.

e) Stability

Drug product stability testing starts with the development of new drugs and ends with the chemical or commercial product being destroyed. According to ICH guidelines, stability tests were conducted to evaluate the drug's and formulation's stability. The ICH guidelines were followed when conducting the stability testing. The cream was put into a bottle and kept for three months at 40 2°C and 75 % relative humidity in a humidity chamber. At the end of the studies, the samples' physical qualities, pH, and viscosity were assessed.

f) Acid value

Take 10 gm of material, accurately weighed, and dissolve it in a 50 ml mixture of equal parts alcohol and solvent ether. Connect the flask to a reflux condenser & slowly heat until the sample is completely dissolved. Add 1 ml of phenolphthalein and titrate with 0.1N NaOH until a faint pink colour appears after 30 seconds of shaking.

n*5.61/w = acid value

n = amount of ml of NaOH necessary

The weight of the material is denoted by the letter w.

g) Saponification value

Introduce roughly 2 gm of material, refluxed for 30 minutes by 25 ml of 0.5 N alc KOH, 1 ml of phenolphthalein, and titrated with 0.5 N HCL immediately.

Saponification value = (b-a)*28.05/w

The volume in ml of titrant = a

The volume in ml of titrate = b

The weight of substance in gm = w

h) Microbial growth test

By streak plate technique, the designed cream was inoculated on Muller Hinton agar media plates, and a control was made by removing the cream. The specimens were kept in the incubator and incubated overnight at 37 degrees Celsius. Just after incubation period, the plates were removed and compared to the control to determine microbial growth.

Result and Discussion

- **Determination of pH:**

Formulation	F1	F2	F3	F4
pH	5.2	6.1	6.5	5.6

Table 3 : pH determination formula

Discussion:-The pH test was performed for base formulation. The pH of the cream was found to be in range of 5 to 7.5 which is good for skin pH. All the formulations of cream were shown pH nearer to skin required, but Formulation F4 shows more appropriate pH.

- **Determination of Viscosity:**

Formulation	F1	F2	F3	F4
Viscosity	23650 cps	25790 cps	23760 cps	26880 cps

Table 4: Viscosity determination formula

Discussion

Viscosity test were performed for Active Base Formulation. Whereas F4 had appropriate viscosity like cream.

Acid Value and saponification value

Formulation	F1	F2	F3	F4
Acid Value	6.3	5.2	5.4	5.8
Saponification	27.0	27.5	26.8	26.3

Table 5: Acid and Saponification value formula

Discussion

From the above observation, the formulation F3 and F4 shows desired acid value and saponification value.

- **Spreadability test**

Parameter	Formulation			
	F1	F2	F3	F4
Spreadability	25.23 ± 0.5	23.37 ± 0.5	22.15 ± 0.5	21.93 ± 0.5

Table 6: Spreadability test formula

Discussion:-From the observation, the formulation F4 shows desirable spreadability

- **Microbial growth test**

Discussion: There were no signs of microbial growth after incubation period of 24 hours at 37ºC and it was comparable with the control.

- **Accelerated stability testing**

Sn	Evaluation Parameter	F4	F4
		Room Temperature	Accelerated condition(45^0C ± 2), RH(65±5)
1	Appearance	Excellent	Excellent
3	pH	6.4	6.6
4	Consistency	Soft and Semisolid	Soft and Semisolid
5	Viscosity	25880 cps	25915 cps
6	Spreadability	Good	Good
7	Washability	Good	Good
8	Irritency Test	Irritation was not observed	Irritation was not observed

Table 7: Accelerated stability testing formula

Discussion: From the above observation, the formulation F4 stable at room temperature and accelerated condition.

Discussion

- Curcuma longa, pomegranate, Aloe vera, Vitamin E, Amla oil, Green tea oil, Coconut oil, Hibiscus oil, Olive oil, Tulsi oil, and Mint oil are widely recognized for their medicinal properties in Indian traditional medicine and ayurvedic preparation.
- The poly-herbal anti-aging herbal face cream, being an oil-based product, has the ability to readily penetrate the skin's dermal layer and provide exceptional results, hence increasing customer satisfaction.
- As a priceless natural gift, herbal cosmetics are in high demand on the international market Aloesin, a bioactive molecule found in Aloe vera extract, has been reported. Furthermore, because of its antioxidant action, Aloe vera has been claimed to protect skin against ultra violet radiation damage.
- Consequently, we made an effort to formulate a polyherbal face cream using different concentrations of Curcuma longa, pomegranate, Aloe vera, Vitamin E, Amla, Green Tea, Coconut, Hibiscus, Olive, Tulsi, and Mint oils. Based on our research, formulation F4 was shown to be more stable than the other formulations, although not as stable as F4.
- The F4 formulation was homogenous, emollient, non-greasy, and easily removed after use. Its pH was almost constant.
- Regarding skin irritation and allergy sensitization, there was no difference observed between the stable formulations. Extracts of pomegranates (Punica granatum) and green tea (Camelia sinensis) include a range of advantageous antioxidants and free radical neutralizers, including ellagic acid, punicalagins, gallic acid, and punicalins.
- These antioxidants contain vitamin E, which is essential for both preserving healthy skin and soothing and healing damaged skin.
- Mucopolysaccharides included in aloe vera aid in the binding of moisture to the skin.
- Aloe vera activates fibroblasts, which produce elastin and collagen fibers, which plump up and smooth out skin.
- Amla oil has anti-oxidant properties and is firming, brightening, softening, and tightening pores.
- Hibiscus oil promotes the creation of collagen, blood purification, and skin brightness in addition to its anti-aging qualities.
- Tulsi oil provides a cooling and soothing effect, improves skin brightness, and has antimicrobial qualities.
- Mint oil soothes irritation and inflammation, helps maintain collagen structure, and has antibacterial, antimicrobial, and cooling qualities. Keepers
- Coconut oil has anti-itch, moisturizing, and flavoring properties for dry skin.
- Curcuma longa oil has been shown to have anti-inflammatory, antibacterial, and antioxidant qualities.

Conclusion

As discussed above, the produced formulation showed good spreadability, no evidence of phase breakdown, and great consistency during the study period. Based on previous studies, it can be inferred that creams can be made with herbal extracts.

The antioxidant activity of aloe vera and punica granatum extracts was strong. According to the findings of several cream tests, the composition can be applied topically to protect skin and slow down the aging process. Creams made with natural extracts are feasible.

The results showed that combining the Punica granatum leaf extracts with other ingredients in varying ratios had a multifunctional effect on the skin, resulting in antiaging, whitening, and sunscreen properties. As we all know, it is impossible to raise the efficacy of a single plant extract's medicinal and cosmetic properties, but it is possible to increase the efficacy of extracts by mixing diverse natural components.

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