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Research Article

Formulation And Evaluation of Anti-Aging Cream Activity of *Tagetes Erecta* and Beetroot

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ABSTRACT

Early skin aging is a major and widespread aesthetic issue in today's society. Early skin aging can be caused by a number of factors, such as UV radiation exposure, oxidative damage to epidermal cells brought on by a poor diet or sedentary lifestyle, etc. Minerals, tannins, polyphenols, carotenoids, fatty acids, and vitamin C are all abundant in rose hip fruit. These nutrients are crucial for lowering oxidative stress and giving skin and dermal cells all the components they need. Rose fruit, when combined with zinc oxide and salicylic acid, offers protection from the sun's UV rays and a remedy for skin issues associated with premature cell aging. The purpose of this research is to create and assess an anti-aging cream that incorporates zinc oxide, salicylic acid, and rose fruit. Zinc oxide has sun screening qualities, while the components of rose hip and salicylic acid demonstrated desirable anti-aging qualities by removing free radicals and lowering oxidative stress. After the cream was tested, the findings showed that the antiaging cream formulation and its components were of a constant caliber and were simple to use. Based on the aforementioned findings, it can be said that the formulation comprising zinc oxide, salicylic acid, and rose extracts will be safe to use as an anti-aging skin cream. Anti-aging creams are primarily moisturizer-based skin care products that are sold with unsubstantiated claims that they can reduce, mask, or prevent signs of aging on the skin, making the user appear younger. By decreasing indications of aging, increasing collagen formation, and enhancing general skin health, an anti-aging cream can help maintain youthful, vibrant skin when used regularly.


INTRODUCTION

Fine lines, wrinkles, and pigmentation are all results of aging, a natural process that alters the skin's suppleness, moisture, and general

appearance. Because of their strong anti-inflammatory, antioxidant, and skin-rejuvenating qualities, natural ingredients like beetroot and *Tagetes erecta* (Mexican marigold) have become

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popular in skincare products to fight these indications of aging. A potent, chemical-free remedy for preserving young, glowing skin is an anti-aging cream made with *Tagetes erecta* and beets. Characteristics aid in lowering environmental stresses that hasten aging, as well as redness and inflammation. Its UV-protective ingredients also protect the skin from damaging UV rays, which lowers the chance of wrinkles, dark spots, and photoaging. In contrast, beetroot is a superfood for the skin, full of vital minerals, betalains, vitamin C, and polyphenols that improve skin moisture, encourage the production of collagen, and lighten the complexion. One of beetroot's main ingredients, vitamin C, promotes the formation of collagen, which keeps skin supple and firm while lessening the visibility of wrinkles. *Tagetes erecta* and beetroot work together as an anti-aging cream to promote suppleness, defend against environmental damage, and restore skin vitality. Because it supports long-term skin health and regeneration while supplying vital nutrients to the skin, this natural formulation is especially helpful for people who want to stay away from synthetic chemicals. The cream is a great option for anyone looking for a mild yet efficient anti-aging treatment because it helps fight sagging, fine lines, and dryness. Skin that is smoother, firmer, and looks younger can be achieved with regular use of this nourishing and revitalizing cream. The combination of *Tagetes erecta* and beetroot stands out as a viable, environmentally safe, and efficient alternative for naturally preserving healthy, bright skin in light of the growing demand for plant-based skincare products. The harsh chemicals, artificial perfumes, and artificial preservatives found in many commercial anti-aging lotions have the potential to irritate or harm skin over time. A safer, chemical-free substitute that nourishes the skin with vital nutrients and shields it from environmental harm is a natural anti-aging lotion made with *Tagetes erecta* and beets. Additionally,

botanical-based skincare is sustainable and environmentally friendly, promoting clean beauty trends that highlight components derived from plants. A natural formulation encourages long-term skin health, guaranteeing noticeable and long-lasting changes, in contrast to synthetic anti-aging therapies that might only produce short-term effects. An extremely powerful, all-natural way to fight the indications of aging is with an anti-aging cream enhanced with *Tagetes erecta* and beetroot. This composition helps maintain firm, moisturized, and youthful skin while guarding against environmental damage and oxidative stress by utilizing the power of antioxidants, vitamins, and collagen-boosting components. This cream is a great option for people looking for a sustainable, natural, and effective anti-aging skincare solution because it may brighten the complexion, minimize wrinkles, and enhance the texture of the skin overall.

Mechanism:

The structure, flexibility, and general appearance of the skin are all impacted by the intricate biological process of aging. Wrinkles, fine lines, sagging, and pigmentation are the results of changes in the skin over time, including decreased cell regeneration, increased oxidative stress, decreased moisture, and collagen breakdown. In order to assist restore skin health and preserve a youthful appearance, anti-aging creams are made with bioactive components that target these aging processes. Numerous important processes, including as collagen stimulation, antioxidant protection, hydration, cellular repair, and UV protection, can be used to explain how anti-aging creams work.

1. Promotion of the Production of Collagen and Elastin



The vital structural proteins collagen and elastin are in charge of preserving the firmness, elasticity, and resilience of skin. These proteins are produced less frequently as we age, which causes sagging, wrinkles, and a decrease in the plumpness of our skin. Collagen-boosting chemicals used in anti-aging lotions increase fibroblast activity, which in turn increases the production of these proteins.

2. Defense Against Free Radicals by Antioxidants

Unstable chemicals known as free radicals induce oxidative stress, which damages DNA, causes inflammation, and accelerates aging. Collagen and elastin are broken down by free radicals, which are produced more quickly by environmental factors such as pollution, UV radiation, and pollutants. Strong antioxidants included in anti-aging lotions shield skin cells from oxidative damage, neutralize free radicals, and more.

3. Retention of Moisture and Deep Hydration

Hydration is necessary to keep skin young, plump, and smooth. The skin's natural capacity to hold onto moisture declines with age, resulting in roughness, flakiness, and dryness. Humectants, emollients, and occlusives are ingredients found in anti-aging creams that hydrate the skin, enhance moisture retention, and stop trans-epidermal water loss (TEWL).

4. Cell Repair and Regeneration

As people age, their skin's cell turnover slows down, resulting in uneven pigmentation, rough texture, and dullness. Anti-aging creams aim to replace damaged skin cells with new, healthy ones by promoting cellular regeneration and repair.

5. Defense Against Photoaging Caused by UV

One of the main factors for accelerated aging is UV radiation, which also contributes to dark spots, wrinkles, and decreased skin flexibility. Broad-spectrum UV filters and organic photoprotective components are two components of anti-aging lotions that protect the skin from damaging UV radiation.

Clinical Uses:

- **Tagetes Erecta**

Tagetes erecta (marigold)-based anti-aging lotions have a number of potential therapeutic advantages, particularly in the fields of dermatology and cosmetic skin care. Because Tagetes erecta contains bioactive substances like flavonoids, carotenoids, and essential oils, it can be used in therapeutic settings to treat a range of aging-related skin issues.

These are the main clinical applications:

1. Skin Firming and Wrinkle Reduction
2. Skin Healing and Regeneration
3. Hyperpigmentation Reduction
4. Protection of Antioxidants from Environmental Stressors
5. Hydration and Moisture Retention of the Skin
6. Therapy for Aging-Related Skin Conditions
7. Improving Skin Texture and Tone:

Beetroot

1. Antioxidant Defense Against Aging Skin
2. Increasing the Production of Collagen for Firmer Skin
3. Retention of Hydration and Moisture
4. Brightening of the Skin and Reduction of Pigmentation
5. Wound Healing and Anti-Inflammatory Properties
6. Enhancement of Blood Circulation and Detoxification



Physiology of Skin

The largest organ in the body, the skin makes up around 15% of an adult's total weight. Apart from providing defense against external physical, chemical, and biological threats, it also carries out several essential tasks, including assisting with thermoregulation and preventing excessive water loss. The mucous membranes that cover the body's surface form a continuous layer of skin. The skin and its associated tissues make up the integumentary system. The epidermis, dermis, and subcutaneous tissue are the three layers that make up the skin. The outermost layer, or epidermis, is

made up of a particular type of cell called keratinocytes, which generate the protective protein keratin, which is a long, thread-like strand. The main component of the dermis, or middle layer, is collagen, a fibrillar structural protein. The dermis is located on the panniculus, or subcutaneous tissue, which is made up of tiny fat cell lobes called lipocytes. The position of these layers inside the body's architecture has a significant impact on their thickness. For instance, the epidermal layer of the palms and soles of the feet has the thickest layer, measuring around 1.5 mm, while the eyelid has the thinnest layer, measuring less than 0.1 mm.

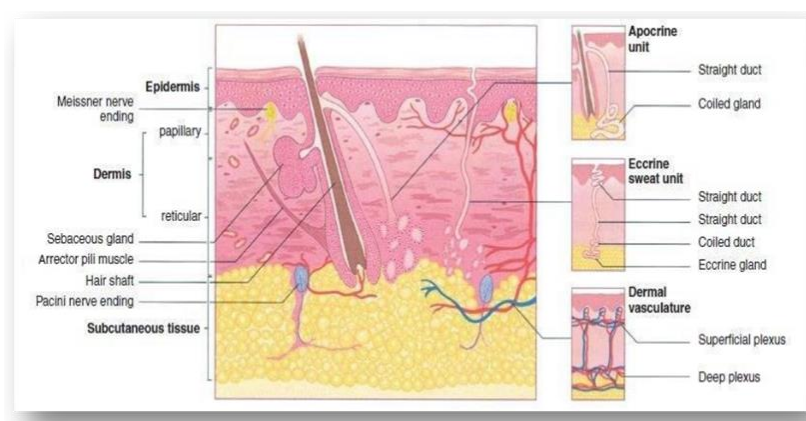


Figure 1

- **Epidermis:**

The epidermis is outermost layer of skin. It contains three distinct cell types:

a) Squamous cells.

The outermost layer that is continuously removed is called the stratum corneum.

b) Base cells.

Basal cells are found at the base of the epidermis, just below the squamous cells.

c) Melanocytes.

At the base of the epidermis are melanocytes, which are responsible for producing melanin. This is what gives the skin its color.

- **Dermis:**

The dermis is the primary layer of the skin. The dermis contains blood arteries, lymph vessels, sweat glands, hair follicles, collagen bundles, fibroblasts, nerves, and sebaceous glands. Collagen is the type of protein that keeps the dermis together. The skin gets its strength and suppleness from this layer.

- **Subcutaneous Fat Layer:**

The skin's lowest layer is the subcutaneous fat layer. It is made up of a network of fat cells and collagen. By serving as a shock absorber, it shields the body from harm and aids in preserving body

heat.

Functions of skin:

- Protection
- Thermoregulation
- Sensation
- Excretion
- Vitamin D

Aim and Objectives:

Aim: The primary aim of this research is to formulate, evaluate, and develop a natural anti-aging cream using the synergistic properties of *Tagetes erecta* and Beetroot.

Objectives:

1. Reduces Wrinkles and Fine Lines:

By boosting circulation and stimulating skin regeneration with the rejuvenating qualities of beets and *Tagetes erecta*, the result is firmer, smoother skin.

2. Encourages Skin Hydration and Elasticity:

It is well recognized that these substances offer nutrients and moisture that enhance skin elasticity, maintaining the skin's suppleness and young appearance

3. Offers Antioxidant Protection:

Tagetes erecta possesses anti-inflammatory and antioxidant qualities that shield skin from early aging, while beetroot is high in vitamins and minerals, including vitamin C, which aids in the fight against free radicals.

4. Soothes and Revitalizes the Skin:

Tagetes erecta's calming qualities can aid in lowering inflammation and irritation, relieving sensitive skin and encouraging a bright, youthful complexion.

5. Natural and Safe Skin Care:

Develop a mild yet potent cream devoid of dangerous ingredients that is safe for everyday use and advantageous for all skin types, particularly those exhibiting early aging symptoms.

4. Drug Profile

- **Tagetes Erecta** ^[3]

Binomial Name: *Tagetes erecta*

Table: 01

Kingdom	Plantae
Order	Asterales
Family	Asteraceae
Clade	Angiosperm
Genus	<i>Tagetes</i>
Species	<i>T. erecta</i>



Figure 2

Synonyms: African marigold, American marigold, Mexican marigold.

- **Beetroot** ^[12]

Binomial Name: *Beta vulgaris*

Table: 02

Species	Beta vulgaris
Subspecies	Vulgaris
Origin	Sea beet



Figure 3

Synonyms: European sugar beet, Harvard beet, Spinach beetroot.

- **Tagetes Erecta** ^[1-10]

African marigold, or *Tagetes erecta*, is a medicinal plant that is utilized extensively for its pharmacological and cosmetic properties. Its antioxidant, anti-inflammatory, antibacterial, and anti-aging qualities are attributed to its abundance of bioactive phytochemicals, such as terpenoids, carotenoids, flavonoids, essential oils, and phenolic compounds. *Tagetes erecta* is a crucial component of skincare, cosmetics, and traditional medicine because of these chemicals.

Phytochemistry ^[1]

1. Carotenoids: Skin Protection & Antioxidant
Tagetes erecta's yellow-orange hue is caused by natural pigments called carotenoids. They are essential for preventing UV damage and counteracting oxidative stress.

2. Flavonoids: Skin Repair & Anti-Inflammatory
 Polyphenolic substances called flavonoids have anti-inflammatory, antioxidant, and skin-protective qualities.

3. The Hydrating and Antimicrobial Properties of Essential Oils
 Bioactive terpenes and monoterpenoids, which have antibacterial, anti-inflammatory, and moisturizing qualities, are present in *Tagetes erecta* essential oil.

4. Phenolic Compounds: Skin Healing & DNA Protection

Tagetes erecta contains phenolic chemicals that have potent anti-aging and antioxidant properties that support skin regeneration and DNA protection.

5. Terpenoids: Wrinkle Reduction & Collagen Synthesis

Bioactive substances called terpenoids increase the production of collagen, increase the suppleness of the skin, and lessen wrinkles.

- **Beetroot** ^[13]

1. Betalains, which include betacyanins and betaxanthins,

2. Phenolic Substances (Ferulic Acid, Gallic Acid, Caffeic Acid, and Chlorogenic Acid).

3. Anti-aging: Prevents fine wrinkles and preserves collagen.

4. Flavonoids (myricetin, quercetin, and kaempferol)

5. Carotenoids (zeaxanthin, lutein, and β -carotene)

6. Nitrates in the Diet

7. Minerals & Vitamins (Folic Acid, Iron, Magnesium, Vitamin C, B6)

8. Brightens Skin: Diminishes dark spots and pigmentation.

1. Experimental Studies:

a) METHODOLOGY:

- Tagetes erecta
- Beetroot
- Aloe vera
- Liquid Paraffin
- Borax
- Methyl Paraben
- Rose Oil

❖ **Preparation of Extract:**

Petals from 10 gm of marigold flowers (Tagetes erecta) were ground into a fine powder in a mortar and pestle after being allowed to dry naturally in the sun. For four days at room temperature, the powder was macerated with 50 ml of the solvent system (30:70 water: ethanol).

❖ **Preparation of Anti-aging Cream**

- Each component was carefully weighed.
- Maintain the temperature at 75°C while heating liquid paraffin and beeswax in a borosilicate glass beaker. (The oil phase)

- Dissolve borax and methyl paraben in distilled water.
- The mixture should then be heated to 75°C until the methylparaben and borax are completely dissolved and a clear solution is obtained. (Phase of water) Add this aqueous phase to the oily phase gradually.
- Next, add a measured amount of Tagetes erecta and beetroot extract, and mix vigorously until a creamy cream develops.
- As a scent, add enough drops of rose oil. Put the cream on the slab and add a few drops of distilled water if necessary.
- To get a smooth texture and make sure all the ingredients are well blended, mix the cream in a geometric design on the slab.

❖ **Formulation of preparation of Anti-aging Cream**

Table: 03

Sr. No	Content	Composition		
		F1	F2	F3
1	Tagetes erecta	8 gm	10 gm	12 gm
2	Beetroot	4 gm	5 gm	6 gm
3	Bees wax	1.2 gm	1.6 gm	2.0 gm
4	Borax	0.3 gm	0.4 gm	0.5 gm
5	Methyl paraben	0.06 gm	0.08 gm	0.1 gm
6	Liquid Paraffin	1.5 gm	2 gm	3 gm
7	Rose oil	0.6 gm	0.8 gm	1 gm
8	Distilled water	Q. S	Q. S	Q. S
	Total	15gm	20 gm	25 gm

a) Evaluation of Anti-aging Cream

A number of quality control procedures, such as visual inspection and physiochemical and

conditioning performance testing, were carried out to assess the developed formulation's

Organoleptic Properties:



Table: 04

Parameters	Tagetes erecta	Beetroot
Texture	Soft and Delicate Petals, Slightly Waxy	Firm and crunchy when raw, Smooth and soft when cooked.
Smell	Strong, Pungent, Slightly Citrusy or Herbal.	Earthy, Slightly Sweet, Fresh.
Taste	Bitter, Slightly Astringent and Peppery.	Sweet, Mildly Bitter and Earthy
Tongue Sensation	Slightly Bitter and Astringent.	Sweet and Earthy.

Phytoconstituent	Tagetes erecta	Beetroot
Flavonoids	Present	Present
Saponins	Absent	Present
Phenols	Present	Present
Tannins	Present	Present
Alkaloids	Absent	Present
Essential Oils	Present	Absent

Screening Of Cream Formulation Phytochemically

❖ Procedure Of Phytochemical Tests

Table: 06

Phytochemical Test	Reagent / Procedure	Observation / Interpretation
Flavonoids	Add 2ml of extract, 1 ml conc. HCl, and a small magnesium ribbon.	Orange, pink or red coloration appears.
Saponins	Shake 5ml extract with water in test tube for 2 min vigorously.	Positive: Persistent Froth formation indicates Saponin.
Phenols	Add few drops 5% NaOH Solution to extract or cream.	Formation of Yellow colour indicates Phenol compound.
Tannins	Add few drops 1% ferric chloride solution to extract or cream.	Formation of dark blue colour indicates Tannins.
Alkaloids	Add few drops of Dragendroff's reagent to cream.	White or Creamy Precipitate.
Essential Oils	Heat small amount of cream containing Calendula and Cinnamon extract.	Characteristic Cinnamon or Calendula scent confirms presence of essential oils.

2. Herbal Drug Extraction

Herbal medicines are extracted using a variety of methods, including decoction, percolation, and maceration. Other methods include microwave-assisted extraction, pressurized liquid extraction, and Soxhlet extraction.

- **Solvent Extraction Method:** This method uses ethanol (alcohol) or other solvents to extract the bioactive ingredients from dried calendula petals. The solvent extraction method is a well-liked and efficient technique for extracting bioactive

compounds from plant materials like calendula officinalis and cinnamon. A solvent, typically alcohol (like ethanol), is used to dissolve the plant material's active components, which can then be added to lotions, tinctures, and other preparations.

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Materials Required:

1. Plant material, such as dried Tagetes erecta or Beetroot.
2. Solvent (often ethanol or an ethanol-water blend)
3. A glass container or jar with a cover that fits snugly
4. Cheesecloth or a strainer (for filtration)
5. Mortar and pestle for crushing plant material
6. Distilled water (for dilution, if necessary)
7. Measuring tools, such as graduated cylinders and pipettes
8. Storage containers (for the extracted final product)
9. Stirring rod or shaker (optional)

▪ Procedure for Extracting Solvents

1. Preparation of Plant Material
2. Selecting the Right Solvent
3. Blending Plant Material with Solvent
4. Maceration, or infusion
5. Filtration
6. Storage

3. Beneficial Properties Of 'Powder of The Drugs'

Powdered forms of herbal remedies, such as Tagetes erecta and Beetroot, retain many of the bioactive compounds present in the plant material and offer several benefits. When added to lotions, oils, or even consumed as teas or capsules, these powders can have medicinal effects.

a) An extractive soluble in alcohol

100 milliliters of 90% alcohol were added to a Stoppard conical flask containing five grams of properly weighed powdered medication. An electric shaker was used to continually shake the mixture for six hours, after which it was allowed to macerate overnight. The filter was then carefully evaporated until it was dry, and the extract's weight and % were determined.

Alcohol-Soluble Extractive: $(\text{Extractive Weight/Drug Weight}) \times 100$

b) Water-soluble extractive

One hundred milliliters of chloroform water were added to a Stoppard conical flask that held five grams of precisely weighed powdered medication. After six hours of constant shaking in an electric shaker, the flask was allowed to macerate overnight. After thorough filtering, the extract was evaporated until it was completely dry. The extract's weight was determined, and its percentage was computed.

Weight of extractive / Weight of drug $\times 100$ equals Water-Soluble Extractive.

c) Total Ash

After weighing three grams of the drug, it was burned in a China dish at a temperature of no more than 450°C until all of the carbon had been removed. The material was weighed once more after cooling.

Total Ash = $\text{Wt. of ash / Wt. of drug} \times 100$

d) Acid Insoluble Ash

The whole amount of ash was produced after boiling with 25 milliliters of diluted hydrochloric acid for five minutes. After that, the insoluble residue was moved to a Gooch crucible, cleaned



with hot water, and burned until the weight remained constant.

Table: 07

Total Parameter	Tagetes erecta	Beetroot
Total Ash Value	8.2 %	6.3%
Alcohol Soluble Content	9.4%	10.1%
Water Soluble Content	12.8%	12.1%

4. Therapeutic Uses

Both beetroot (*Beta vulgaris*) and *Tagetes erecta* (Marigold) are abundant in bioactive substances that have a variety of medicinal uses. Both are powerful anti-aging products; beetroot, which is high in betalains and vitamin C, promotes collagen production and minimizes fine lines, while *Tagetes erecta*, which contains lutein and flavonoids that guard against UV-induced skin damage, minimize wrinkles, and increase skin elasticity. By neutralizing free radicals, their antioxidant qualities stop oxidative stress and accelerated aging. Both plants are beneficial for calming irritated or inflamed skin because they also have anti-inflammatory properties. While beetroot, with its iron and nitrates, enhances blood circulation and tissue repair, *Tagetes erecta*'s antibacterial and tissue-regenerating qualities aid in a quicker recovery from wounds. Beetroot improves skin radiance by increasing blood flow, while marigold's inherent colors help even out uneven skin tone. Both plants promote skin brightening. Their ability to detoxify helps to eliminate toxins, which is good for the skin and general health. Beyond skincare, these plants support cardiovascular health. Marigold keeps plaque from accumulating in arteries, while beetroot lowers blood pressure due to its nitrate content. Furthermore, their immune-boosting properties promote general health; for example, beetroot supplies vitamin C and iron, while marigold contains antibacterial components that aid in the battle against infections. Additionally,

beetroot's antioxidants further guard against macular degeneration, while *Tagetes erecta*'s lutein and zeaxanthin improve eye health. A variety of therapeutic advantages for skin health and renewal are offered by an anti-aging lotion made with *Tagetes erecta* (Marigold) and beetroot (*Beta vulgaris*). By encouraging collagen synthesis and improving skin elasticity, this antioxidant-rich combination—which includes lutein, flavonoids, betalains, and vitamin C—helps fight oxidative stress and reduce wrinkles, fine lines, and sagging. While *Tagetes erecta*'s essential oils fortify the skin barrier and seal in moisture, beetroot's natural humectants profoundly hydrate the skin and prevent dryness. Both components also provide UV protection; beetroot restores UV damage and brightens the skin, while marigold's carotenoids function as natural sunscreens, reducing sun-induced aging and pigmentation. The cream is perfect for acne-prone or irritated skin because of its anti-inflammatory qualities, which reduce redness, inflammation, and sensitivity. Additionally, marigold's antimicrobial and wound-healing qualities promote skin restoration by lessening uneven tone, blemishes, and scars. This anti-aging lotion is a natural and efficient remedy for age-related skin issues because it leaves skin firmer, moisturized, and younger with regular usage.

5. Toxicity

Tagetes erecta



A. Phototoxicity and Skin: Photosensitivity:

When applied to skin exposed to sunlight, the photosensitive chemicals in marigold can result in burns, redness, and irritation. Contact Dermatitis: People who are sensitive to plants in the Asteraceae family (such as daisies and chrysanthemums) may experience itching, rashes, or swelling.

B. Harm to the Respiratory System

Particularly in people with asthma or pollen allergies, inhaling pollen or essential oil vapors might result in coughing, sneezing, or congestion of the nose. Sensitive people may experience headaches or lightheadedness after prolonged exposure to marigold vapors.

C. Toxicology of the Digestive System

Overconsumption of essential oils or marigold extracts might result in diarrhea, vomiting, or nausea. When used in excess, certain chemicals in marigold may hinder the absorption of medications.

D. Impact on the Liver and Kidney

Although it is uncommon, some research indicates that excessive dosages of marigold extracts may have minor nephrotoxic (kidney) or hepatotoxic (liver) consequences.

Beetroot

A. Toxicity from Oxalate and Kidney Stones

People who are prone to calcium oxalate stones may develop kidney stones as a result of the high

oxalates found in beetroot. Beetroot consumption should be restricted in people with a history of kidney stones.

B. Effects of Blood Pressure (Hypotension)

Nitrates, which are abundant in beetroot, are converted to nitric oxide, which relaxes blood vessels and lowers blood pressure. Particularly for those on blood pressure medication, excessive intake might result in hypotension (low blood pressure), lightheadedness, and fainting.

C. Beeturia (discoloration of the stool and red urine)

Beeturia, characterized by crimson or pink urine and feces, can result from consuming large amounts of beetroot.

6. RESULT AND DISCUSSION

Evaluation studies of prepared formulations:

Numerous evaluation studies are carried out to guarantee the safety, stability, and effectiveness of an anti-aging cream that contains beetroot (*Beta vulgaris*) and *Tagetes erecta* (Marigold). These investigations evaluate physicochemical, microbiological, and performance-related factors to ascertain the efficacy and quality of the formulation

I. Physical Appearance:

The color, smell, and consistency of the prepared wound healing cream were examined visually.

Table: 08

Formulation	Colour	Odour
F1	Pink	Sweet



F2	Peach	Slightly Sweet
F3	Pinkish Orange	Sweet and Earthy

II. Determination of Ph:

Using a pH paper, the created formulation's pH was ascertained; the results are displayed below.

Table: 09

Formulation	pH
F1	5.8
F2	6.2
F3	6.1

The ph. of formulated cream that is F1, F2 and F3 was found to be 5.8, 6.2 and 6.1 respectively and the ph. of the formulated cream was almost equal to the ph. of the skin which prevents the irritation of the skin.

III. Determination of Spreadability:

Spreadability guarantees consistent cream application and is crucial for patient compliance. When applied to the skin, good spreadability can guarantee the cream's dissemination.

Table: 10

Formulation	Spreadability (gm.cm/sec)
F1	5.4
F2	6.1
F3	5.8

The F2 formulation has a higher spreadability than the other formulation, at 6.1 gm.cm/sec. This demonstrates that formulation F2 is more spreadable than the others.

IV. Antimicrobial Studies:

Antimicrobial activity is the capability of antimicrobial agents to prevent the growth or destroy harmful microorganisms.

Table: 11

Formulation	Zone of Inhibition
Standard	13
F2	12.6

7. CONCLUSION

The combination of *Tagetes erecta* (Marigold) and beetroot (*Beta vulgaris*) in an anti-aging lotion shows great promise for hydrating, rejuvenating, and preventing premature aging of the skin. These natural compounds' combined anti-inflammatory, collagen-boosting, and antioxidant qualities improve skin elasticity and firmness while minimizing sagging, fine lines, and wrinkles. The formulation is helpful in whitening the skin and avoiding oxidative damage since it contains flavonoids, carotenoids, betalains, and vitamin C, which all give UV protection, improve skin tone, and speed up cell regeneration. Evaluation studies also attest to the cream's good stability, consistency, spreadability, and compatibility with skin pH, all of which guarantee long-term and safe use. All skin types can use the formulation, which is non-toxic and well-tolerated; however, those with allergies or sensitive skin should conduct a patch test prior to usage. This anti-aging cream is a promising natural substitute for skincare and age-defying therapies since it can provide you moisturized, youthful, and glowing skin with consistent use. Marigold's essential oils and bioactive compounds help keep skin firm and supple, while beetroot's natural humectants provide deep skin hydration, reducing dryness and flakiness. Additionally, the formulation helps to balance out the complexion and brighten the skin, which lessens dullness, age spots, and hyperpigmentation. It is also appropriate for people with sensitive or acne-prone skin because

of its anti-inflammatory properties, which calm irritated skin. All skin types can use the cream safely and effectively because it has the perfect consistency, spreadability, stability, and pH compatibility, according to thorough evaluation studies. The formulation's capacity to withstand phase separation and microbiological contamination over time is confirmed by stability testing. The anti-aging cream including *Tagetes erecta* and beetroot is a comprehensive and all-natural skincare treatment that successfully minimizes wrinkles, revitalizes the skin, and shields it from environmental stressors. It is the perfect option for people looking for a plant-based, chemical-free substitute for traditional anti-aging treatments because it can result in firmer, moisturized, and glowing skin with consistent use.

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