



Toning Serum Formulation And Evaluation By Using : Butea Monosperma (Palash)

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Abstract:

Sun rays (UV) Rays and Photodamage can cause unwanted skin aging and wrinkles on the face. Herbal Toning serum is use to Prevent or reduces unwanted damages causes by UV rays.

Natural Therapies have less side effects, are safer and more effective than chemical medications. Formulation containing natural ingredients are becoming more and more common on the international market. Herbal Toning serum improves the appearance of the face and has no negative side effect.

The main aim of the Project was to formulate a natural and safe toning serum which has calming, soothing, and astringent effect on the face and skin it enhance the beauty and can be used in day today life schedule. The extract used are from the ingredients which are easily available and has nutritional values from topical point of view.⁸

Keywords: Skin , Ultraviolet radiation, Skin problems, Aging ,Toning ,Serum, Plash.

Introduction:

Skin: The integumentary system is composed of the skin and its derivatives, which include the hair, nails, perspiration, and oil glands. Protection is one of the skin's primary purposes. It shields the body from environmental elements like temperature, chemicals, and pathogens. the biggest organ in the body, making up one-sixth of the entire weight of the body. It has an adult area of 20 square feet.^{19,15}

Layers of Skin :

Skin Consist of three layer epidermis ,dermis ,hypodermis all three vary significantly in their anatomy and function. The composition of the skin is composed of an complex network that acts as the body's first a defense against chemical, UV light, and pathogen and mechanical injury.^{20,26}

Skin Layer

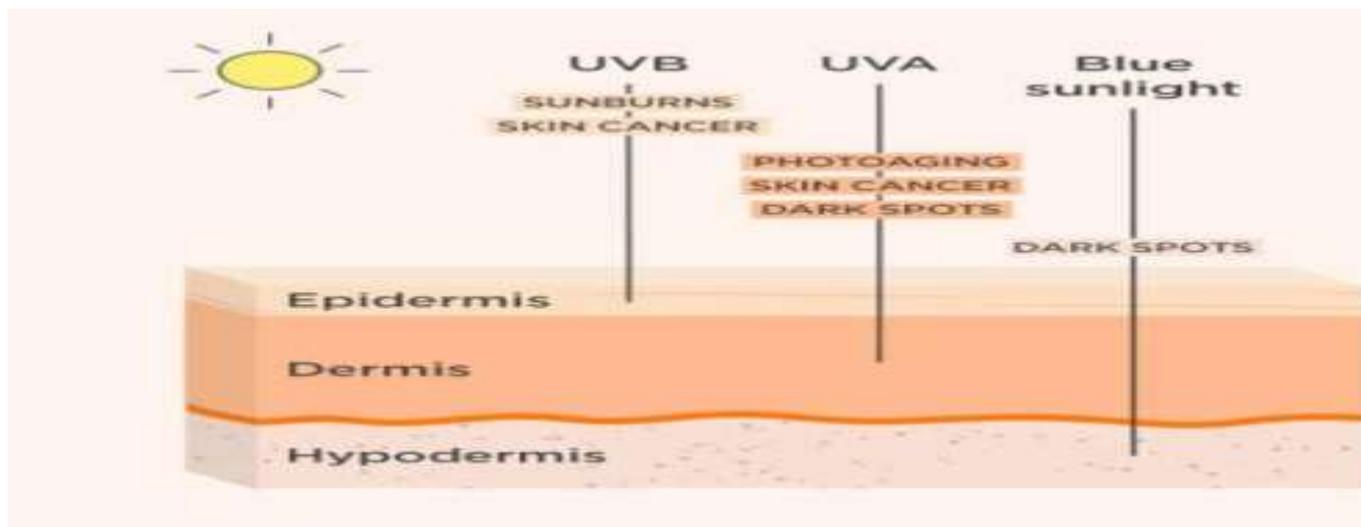


Figure Skin Layers

Skin Functions:

1. Social Interaction
2. Temperature regulation
3. A sensory organ of pain , Temperature & Touch
4. Route of Elimination of waste
5. Protection barrier between internal organ external environment
6. Synthesis of Vitamin D

The skin uses sunlight for production of vitamin D ,which is necessary for healthy bone formation. But there is drawback, Significant skin damages like Photoaging,Dullness, Tanning,Dryness ,Hyperpigmentation and many more.

The pigment melanin is found in the cells that makeup the skins outer layer Skin is shielded from UV radiation by melanin . These can cause early aging by burning the skin and decreasing its elasticity.

People get tanned because exposure to sunlight increases melanin production and darken the skin .When new cell emerge and tanned cell shed, the tan becomes less noticeable. If you take the necessary precautions to avoid being overexposed, some sunshine can be beneficial.^{3,16}

On the other hand, sunburn and tanning can result from excessive UV exposure.

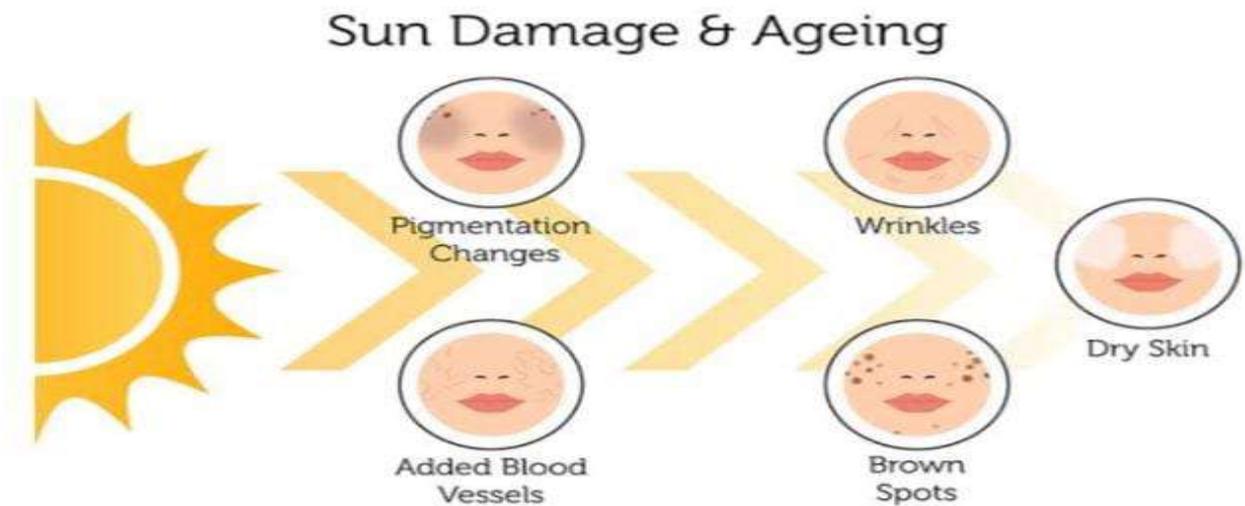


Figure : Skin Problems.

Serum: is a concentrated product which is popular in the field of cosmetology. The term originates from itself in professional cosmetology. The cosmetic serum has the same water or oil concentration as any other cream. Serum are defined as concentrated substance with ten time more organic matter than cream. Therefore, deals with the cosmetic problem quickly and effectively. Face serum is an emulsion with high concentration which comes in both oil-water-based varieties.

Type of serum

- 1) **Oil based Serum**
- 2) **Gel based serum**
- 3) **Water based serum**
- 4) **Balm based serum**
- 5) **Emulsion based serum**

Toning Serum : (Emulsion Based Serum)

Strong and skin effective ingredients are injected straight into the skin by toning serum. Ingredient like palash, lemongrass oil ,peppermint oil ,Alovera , Rose water due to this natural ingredient results are visible in a short period of time .

Some of the primary function of face serum

1. Provide hydration, antioxidant and a concentrated dose of nutrients to the skin.
2. Soothes skin.
3. Shields the skin from free radicals and damage .
4. Improve the appearance of wrinkles, fine lines.
5. Enhances skin brightness.
6. Eliminates Makeup and Oil.
7. Calms your skin.
8. Diminishes the visibility of pores.
9. Helps seal in moisture; tightens and refreshes the skin.
10. Provides and Guards.
11. Maintains pH equilibrium.
12. Restores organic nutrition.

Active Ingredients and uses In Herbal Toning Serum

1. Butea monosperma (Palash)

It is also Known as flame of forest, dhak, palash and bastard teak. Revered as sacred by Hindus, it is prized for producing an abundance of vivid bloom, and it is also cultivated elsewhere as an ornamental.^{4,21}



Figure: Butea monosperma (Palash)

Kingdom	Plantae
Clade	Tracheophytes
Clade	Angiosperms
Clade	Eudicots
Clade	Rosids
Order	Fabales
Family	Fabaceae
Subfamily	Faboideae
Genus	Butea
Species	B.monosperma
Binomial name	Butea monosperma
Synonyms	<ul style="list-style-type: none"> i. Buta frondosa ii. Erythrina monosperma iii. Plaso manosperma iv. Flame of forest v. Dhak vi. Palash vii. Bastard teak
Chemical Constituents	Alkaloids Flavonoids Phenolic compounds Amino acids Glycosides Resin Saponin Steroids

Use of Palash Flower:

The emollient and soothing vitamin E, which also possesses antioxidant, anti-inflammatory, and astringent qualities, is naturally present in palash. When applied topically to sunburns and rashes, the leaf and flower extract calms the inflamed and parched areas of skin and leaves it smooth and hydrated.

Flower Extract of Palash gives Toning effect on skin.

2.Aloe Vera

Aloe vera has been used to heal infections and wounds. Aloe vera is now acknowledged as an essential ingredient in makeup as result to improvements in beauty. It contains almost 20 amino acids, sufficient amount of nutrients such as enzymes, vitamins, calcium, magnesium, and sodium as well as its polysaccharide, nitrogen and other components that make it a miracle plant in terms of beauty.^{2,6,22}

Aloe vera



KINGDOM	PLANTAE
ORDER	Asparagales
FAMILY	Asphodelaceae
SUBFAMILY	Asphodeloideae
GENUS	Aloe
SPECIES	Aloe vera
BOTANICAL NAME	Aloe barbadensis miller
ENGLISH	India Aloe

Active constituent: Water 98% and Polysaccharides, including Pectin, cellulose, hemicellulose, glucomannan, and acemannan.

Active components with its properties

Aloe Vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.

Vitamins

It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline.

Mechanism Action :

- 1. Healing Properties:** After topical and oral aloe vera administration, fibroblast activity and proliferation are stimulated by the interaction of gibberellin, a growth hormone, and glucomannan, a mannose-rich polysaccharide, with growth factor receptors on the fibroblast. This greatly increases collagen synthesis. Aloe gel improved the amount of collagen in the wound while also altering its composition to include more type III collagen and strengthening its cross-linkage. As a result, it quickened the healing process and raised the scar tissue's breaking strength. Following topical therapy, there has been evidence of increased hyaluronic acid and dermatan sulfate synthesis in the granulation tissue of healing wound.^{6,7}
- 2. Effect on skin exposure to UV and gamma radiation:** According to report aloe vera gel have ability to shield skin damage from radiation. The skin produces metallothionein, an antioxidant protein that scavenges hydroxyl radicals and keep the skin's glutathione peroxidase and superoxide dismutase from being suppressed. It inhibits the generation and release of immunosuppressive cytokines derived from skin keratinocytes, including interleukin-10(IL-10), thereby averting UV-induced suppression of delayed type hypersensitivity.¹¹

3. **Anti-Inflammatory action:** Aloe vera lower the synthesis of prostaglandin E2 from arachidonic acid and inhibits the cyclooxygenase pathway.gel extract contained the novel anti-inflammatory substance known as C-glucosyl chromone.¹³
4. **Moisturizing and anti-aging effect:** Mucopolysaccharides aid in keeping the skin hydrated. The production of collagen and elastin fibers by aloe stimulates fibroblast, which makes the skin less wrinkled and more elastic. Additionally, by binding the superficially flaking epidermal cell together, it has cohesive effect that soften the skin .Zinc works as an astringent to tighten pores, and amino acids also soften hardened skin cell. Aloe vera gel gloves have been shown to improve the integrity of the skin, reduce the appearance of the fine wrinkles, and lessen erythema in case of dry skin brought on by occupational exposure.²⁵
5. **Antiseptic effect:** Six antiseptic agents can be found in aloe vera: sulfur, urea, nitrogen ,salicylic acid ,cinnamonic acid ,phenols, and lupeol. They all have the ability to inhibit viruses, bacteria, and fungi.

Use /Purpose :

- I. Prevents and treat acne and dry skin antioxidant effect, cooling effect, hydration of skin.
- II. Fights skin ageing.
- III. Boosts healing of wounds.
- IV. Help in soothe sunburn.
- V. Help in the treatment of psoriasis.

3.Peppermint oil /Mentha piperita

Peppermint oil is essential oil that is extracted from leaves of the peppermint plant .

Peppermint



Scientific Classification

Kingdome	Plantae
Clade	Tracheophytes
Clade	Angiosperms
Clade	Eudicots
Clade	Asterids
Order	Lamiales
Family	Lamiaceae
Genus	Mentha
Species	M.x piperita

Binomial name

Mentha

Mechanism Action : Peppermint oil id used as a cooling and anti-itching ingredient in topical pharmaceutical products, as well as a flavoring and fragrance in cosmetic product .brief alleviation of skin irritations, eczema ,minor cut ,scrapes ,atopic dermatitis, and other skin condition.¹²

Use /Purpose

- Cleanses the skin
- It rejuvenates skin.
- It reduces pimples.
- It cools skin and scalp.
- It stimulates blood flow.

4.Lemon Grass oil:

Lemon grass oil has number of qualities that balance skin tone. Because of its inherent astringent quality, which reduce oil production, it help to reduce pores and dry, oily skin. Lemongrass oil does not cause skin irritation, in contrast to harsh cleanser/serums that contain alcohol. Toning and maintaining the health of skin can be achieved by massaging lemongrass oil onto face .7

Lemon Grass

Kingdom	Plantae
Clade	Tracheophytes
Clade	Angiosperms
Clade	Monocots
Order	Poales
Family	Poaceae
Subfamily	Panicoideae
Genus	Cymbopogon
Type Species	
Cymbopogon schoenanthus	

Active constituent: Myrcene ,Citronellal , Geranyl acetate ,Nerol, Geraniol ,Neral ,Traces of Limonene , Citral.

Use /Purpose

- I. It help to control acne breakouts.
- II. It is a powerful antioxidant with anti-inflammatory ,antimicrobial, and pain-relieving properties.
- III. It is great natural remedy for skin problems such as acne and rashes and help to avoid lots of skin problems .

5. Rose Water

Rose water is ideal for cleaning your skin and eliminating impurities that could cause unsightly skin lesions. It is appropriate for people with all skin types, even those with sensitive skin, due to its gentle nature.



Active constituent: Phenyl ethanol, Linalool, Citronellol, Nerol, Geraniol.

Use /Purpose

- I. Rose Water helps prevent dry and irritated skin.
- II. With its antibacterial properties, it can balance out your skin complexion and fight against red and blotchy areas.
- III. Also highly effective in treating oily, acne-prone skin.

6. Glycerin : Due to its humectant quality, glycerin draws water into skin's surface by drawing it out of the dermis, the skin's underlying layer. Glycerin is frequently blended with different kinds of substances in commercial skin moisturizing products in order to maximize its therapeutic moisturizing effect.

Use /Purpose

- I. Agent to help oil and water-based ingredients mix efficiently.
- II. Thickening agent.
- III. Moistening agent.
- IV. Preservative.
- V. Moisturizes the epidermis.
- VI. Protect skin from irritants.

Extraction Method

Butea monosperma flower (Palash) extract

1. Butea monosperma flower were collected and wash with distilled water and dried in shade.
2. After proper drying, Petal of flower were powdered
3. Then take 5g of butea monosperma flower powder in 50ml of distilled water
4. Then the solution was heated on a water bath at 80-100°C, and concentrated up to 20ml.
5. Filtered the extract by using muslin cloth.
6. Extract is obtain.



Figure: Extract of Flower.

Formulation of Toning Serum

The toning serum was prepared which comprised extract of *Butea monosperma* flower (Palash), Alovera, Peppermint oil, Lemon grass oil with a different concentration. The toning serum was prepared by using Tween 80, Tween 40, Sodium benzoate, glycerin and rose water in sufficient quantity to prepare 50ml toning serum.

Two phases are prepared: oil phase and water phase.

1. Preparation of oil phase: The oil soluble ingredients such as Tween 80, Tween 40, Peppermint oil, lemon grass oil are taken in a beaker and melted at 70 °C.

2. Preparation of water phase: Water phase is prepared at the same time by mixing Alovera gel, *butea monosperma* flower extract, glycerin, sodium benzoate and rose water up to qs.

3. Preparation of emulsion: Emulsion was prepared by adding oil phase into liquid phase drop wise under mechanical stirring at 700 to 800rpm to obtain o/w biphasic emulsion.

Formulation Table

Sr.no	Ingredient	Batch (F1)	Batch (F2)
		Quantity	Quantity
1.	Plash Extract	5ml	5ml
2.	Alovera gel	12ml	14ml
3.	Peppermint oil	2ml	2ml
4.	Lemongrass oil	2ml	1ml
5.	Glycerin	13ml	12ml
6.	Sodium Benzoate	4ml	3.5ml
7.	Tween 80 & 40	2ml	2.5ml
8.	Rose Water	10ml	11ml

Results :**Batch 1****Figure: Batch 1**

1. Failed Because of instability and phase separation .
2. Process of formation was carried without mechanical stirring process.

Batch 2 Failed.**Batch 3**

1. After the failure of Batch 1 process of formation of serum is carried out through mechanical stirring process.
2. oil phase is added to water phase with the help of dropper.

**Figure : Mechanical Stirring.**



Figure: Final Product.

Table no 1: composition of development formulation for 50ml

Sr.no	Ingredients	Quantity (ml)	Category
1.	Plash Extract	5ml	Toning agent.
2.	Aloevera gel	15ml	Anticancer, Antiseptic.
3.	Pippermint oil	0.5ml	Anti-inflammatory.
4.	Lemongrass oil	o.5ml	Antimicrobial.
5.	Glycerin	12.5ml	Humectants.
6.	Sodium Benzoate	3ml	Preservative.
7.	Tween 80 & 40	1.5ml(60:40)	Emulsifiers.
8.	Rose water	12ml	Fragrance and Vehicle.

Application of Toning Serum :

- 1.Start with a clean Face :** Its important to cleanse and exfoliate your skin before applying serum.
- 2.Apply a pea-sized amount :** Apply a small amount to your palm and gently massage it into your skin.
- 3.Use gentle circular motions :** Apply the serum with gently and circularly. This will help the ingredients to absorbed more evenly into skin.
- 4.Store the serum in a cool, dark place :**Light and heat can break down face serum and reduce its efficacy.

Effect of serum



Before Application

After Application

Evaluation Test of Product

Result

Color	Yellow
Odor	Plesant characteristic
Texture	Smooth Homogenous
Homogeneicity	Good
Ph	5.08
Spreadability	uniform
Phase seperation	Nil
Feel of application	Cooling
Irritability	Non-Irritable
Consistency	Good
Washability	Easily washable
Stability	Product is stable at room temperature.
Light exposure	No any discolouration of product

Conclusion:

The current investigation was conducted with the aim of preparing the toning serum for face natural ingredients use in formulation are skin friendly and it provides beneficial effect to skin like toning skin ,prevent dryness and sun burn and tan. Using herbs to tone skin by creating natural aqueous extract occurring natural substances that are frequently used for skin traditionally. Herbal toning prepared is effective for the smoothening, calming, astringent, and rejuvenating effect on the skin. It is non irritable and can be used on daily bases for enhancing the natural beauty of human skin.

The formulation was also found to possess significant antioxidant activity which may contribute to its toning activity. Serum was found to have good homogeneity along with good Spreadability aand pH in the range of skin. Thus, the serum can be used topically for improving the health and rejuvenation of the dried and pale skin . It was also found that the ingredients like Peppermint oil, lemon grass oil, Aloe vera gave the best results for toning skin detaining skin hydration and acne problems

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8. Formulation and Evaluation of Herbal Face Toner

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