IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

FORMULATION AND EVALUATION OF LIQUORICE EYE PATCH FOR DARK CIRCLE

[1]Anoshya Joy, [2]Anagha S Kumar, [3]Melsha Peter, [4]Sandra K.S, [5]Sethu Lekshmi.S, Santy Rose P
[1]STUDENT, [2]STUDENT, [3]STUDENT, [4]STUDENT, [5]STUDENT, ASSISTANT PROFESSOR
[1]ST. JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA,
[2]ST.JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA,
[3]ST. JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA,
[4]ST. JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA,
[5]ST. JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA

INTRODUCTION

Under eye patches are essentially masks made especially for the sensitive skin beneath the eyes. Although hydrogel is typically used to create these patches, other skin-friendly materials including fabric and bio-cellulose are also used. In order to address the enduring skin issues, the under-eye patches are soaked in serums or essences that are enhanced with concentrated vitamins, minerals, and other necessary components.

Fig:1

In this day of technology, long commutes, late-night parties, binge-watching films and television shows, extended screen time, stress, and poor eating habits have all negatively impacted most people's sleep patterns and general wellbeing. The skin is directly impacted by poor sleep and self-care, which shows up as aging symptoms. Wrinkles, crow's feet, dark circles, puffiness around the eyes, and skin discoloration are common signs of aging. around-eye patches are a quick and effective way to address dark circles, puffiness around the eyes, and skin pigmentation—all of which are indicators of aging skin.

In this study, we have replaced hydrogel with gelatin as the primary biomaterial for our application. The decision to utilize gelatin stems from its natural origin, biocompatibility, and biodegradability. Gelatin, derived from collagen, offers a favorable environment for cell attachment and proliferation, making it suitable for various biomedical and tissue engineering applications.

Gelatin possesses several advantageous properties compared to synthetic hydrogels. It is a natural polymer that exhibits thermo-reversible gelation, meaning it can transition from liquid to gel with temperature change. This characteristic allows for easier handling and processing during fabrication. Additionally,

gelatin contains bioactive motifs such as RGD (arginine-glycine-aspartic acid) sequences that promote cell adhesion, a feature often absent in standard hydrogels.

Types of eye patches

1.Hydrogel eye patch: It contains calming components like Hyaluronic acid, green tea and Aloe vera.

2.Collagen eye patch: collagen peptides are present, which promote the formation of collagen.

3.Cooling Eye Patches: It contain cooling and soothing substance like cucumber, peppermint or menthol.

4.Herbal Eye Patch: Infused with Liquorice, lavender, or chamomile to help soothe and lessen puffiness.

5.Gold Eyes Patch: Include gold particles that support the formation of collagen, enhance circulation, and lessen inflammation.

6.Charcoal Eye Patches: Include activated charcoal, which lessens the visibility of dark circles by cleansing and detoxifying the skin.

7.Silicone Eye patches: Composed of medical-grade silicone, which helps to tighten and smooth the skin while lessening the visibility of wrinkles and fine lines.

8.Micro needles Eye Patches: Include small micro needles that aid in promoting the Creation of collagen, enhancing skin texture, and lessening the visibility of wrinkles and fine lines.

9.Vitamins Eye Patches: Filled with energizing vitamins such as vitamin K, vitamin C, or vitamin E, that helps to brighten, firm, and nourish the skin.

10.Bio- Cellulose Eye Patches: Composed of bio-cellulose, which helps to calm, moisturize, and soothe the skin while lessening the visibility of puffiness and dark circles.

Innovative herbal-based cosmetics like Liquorice eye patches are made to soothe and revitalize the sensitive skin around the eyes. Since ancient civilizations prized licorice extract for its therapeutic and cosmetic qualities, the idea of employing it in skincare products has existed. Liquorice extract's ability to lower inflammation, increase skin suppleness, and brighten the complexion has been confirmed by recent studies.

Liquorice extract's inherent anti-inflammatory and antioxidant qualities are used in the patches to treat common issues like:

1.Lessening the look of puffiness and dark circles: Liquorice extract helps to improve circulation and decrease inflammation.

2.Fine lines and wrinkles: Liquorice extract's antioxidant qualities aid in lowering oxidative stress and encouraging the formation of collagen, which smoothes out fine lines and wrinkles.

3.Dullness and discolorations: The brightening qualities of Liquorice extract aid to even out skin tone and lessen the appearance of discoloration and dullness.

4.Weary and irritated eyes: Liquorice extract's relaxing and soothing qualities aid in lowering inflammation and irritation, which relieves weary and irritated eyes.

Fig:2

Fig:3

Tradition and History

Since licorice extract was prized for its therapeutic and cosmetic qualities in ancient civilizations, the idea of employing it in skincare products has existed. For ages, Liquorice root has been utilized in traditional Chinese medicine to treat a range of skin disorders, such as:

-Dermatitis

-Acne

-Eczema

Current Studies and Their Effectiveness

The effectiveness of Liquorice extract in lowering inflammation, increasing skin suppleness, and brightening the skin has been confirmed by recent studies. It has been demonstrated that the extract's triterpenoid saponins, phenolic acids, and flavonoids:

1.Inhibit inflammatory mediators to promote healing and lessen inflammation.

2.Promote collagen production to increase the firmness and elasticity of the skin.

3.Reduce oxidative stress and improve skin health by scavenging free radicals.

The eye patches provide a safe, natural, and mild way to achieve healthier, more radiant-looking skin around the eyes by utilizing the power of Liquorice extract.

Ingredients

1.**Liquorice Extract:** Packed with antioxidant and anti-inflammatory properties, licorice extract promotes skin renewal and calmness around the eyes.

2.**Aloe Vera:** Well-known for its calming and moisturizing qualities, aloe Vera aids in promoting skin suppleness, lowering inflammation, and soothing sensitive skin.

3.**Green Tea Extract**: Packed with antioxidants, green tea extract lowers inflammation, encourages the formation of collagen, and shields the skin from environmental stresses.

4.**Glycerin:** A naturally occurring humectant, glycerin softens, retains moisture, and increases skin flexibility.

5.**Caffeine:** Reduces puffiness and help to constrict blood vessels.

6.**Peptides**: Increases skin suppleness and promote synthesis of collagen

7.**Vitamin K**: Assists in minimizing discoloration and dark circles.

8.**Hyaluronic acid**: Hydrates and plumps the skin.

Benefits of Liquorice Eye Patch

1.Diminishes the Appearance of Dark Circles and Puffiness: By enhancing circulation and lowering inflammation, Liquorice extract helps to minimize the appearance of puffiness and dark circles.

2.Enhances Skin Firmness and Elasticity: Liquorice extract's antioxidant qualities aid in the creation of collagen, which enhances the firmness and elasticity of the skin.

3.Improves Skin Brightness and Radiance: The brightening qualities of Liquorice extract aid to even out skin tone and lessen the appearance of discoloration and dullness.

4.Soothes and Calms Irritated Skin: Liquorice extract's anti-inflammatory and antioxidant qualities aid in reducing inflammation and accelerating the healing process.

Advantages

1.Natural and Gentle: Because Liquorice eye patches are composed of natural substances, they are mild and appropriate for skin that is sensitive.

2.Easy to Use: Just place the patch beneath the eyes and let it sit there for 15 to 30 minutes.

3.Convenient: Ideal for usage while traveling, at home, or in the workplace.

4.Non-Comedogenic: Because Liquorice eye patches are non-Comedogenic, they won't irritate skin that is prone to acne or clog pores.

Safety Measures

1.Patch Testing: To make sure you are not allergic to any of the substances, conduct a patch test prior to using the eye patches.

2.Avoid Eye Contact: Since the patches are exclusively intended for use under the eyes, avoid making direct contact with the eyes.

3.Stop Using: Stop using if you feel any discomfort, redness, or irritation.

4.Storage: To preserve the eye patches' strength and efficacy, keep them in a cool, dry location

Storage Guidelines for Liquorice Eye Patch

Storage conditions

1.Temperature: Keep the eye patches between 15°C and 30°C (59°F and 86°F) at a constant temperature.

2.Humidity: A dry atmosphere with a relative humidity of 60% or below is ideal for storing the eye patches.

3.Light: Keep the eye patches out of direct sunlight, ultraviolet light, and other bright light sources.

Packaging and Handling

1.Original packing: To avoid contamination and damage, keep the eye patches in their original packing.

2.Airtight Container: To preserve the eye patches' freshness and effectiveness, keep them in an airtight container if the original packing is not available.

3.Handle with Care: To prevent harming the eye patches or reducing their efficacy, handle them gently.

Shelf Life

1.Expiration Date: Before using the eye patches, make sure to check the packaging's "best by" or expiration date.

2.Use Within: Liquorice eye patches usually last six to twelve months after they are manufactured.

3.Spoilage Indications: Prior to using the eye patches, look for indications of spoiling, such as an unpleasant odour, a slimy texture, or the development of mould.

Precautions

1.Prevent Contamination: To avoid spoiling or infection, keep the eye patches away from contaminants and avoid touching them.

2.Keep Out of Children's Reach: To prevent misuse or unintentional consumption, keep the eye patches out of children's reach.

3.Allergic reactions: Stop using the product and see a doctor if you have any adverse symptoms, such as itching, redness, or swelling.

Extra Advice

1.Store Upright: To avoid damage or leakage, store the eye patches upright.

2.Examine package: Keep an eye out for any indications of damage, such as rips, holes, or wrinkles, on the package

3.Avoid Freezing: The chemicals or packaging may be harmed if the eye patches are frozen.

There are advantages and disadvantages to freezing eye patches.

Advantageous Impacts:-

1.Increased cooling effect: Eye patches that are frozen have a stronger cooling impact, which helps soothe and lessen puffiness.

2.Extended shelf life: Freezing can prolong the eye patches' shelf life by preserving their components.

3.Decreased inflammation: Swelling and inflammation can be lessened by cold temperatures.

Adverse Impacts:-

1.Ingredient damage: Certain substances may degrade or lose their effectiveness when frozen.

2.Texture changes: The eye patches may become brittle or acquire an unpleasant texture as a result of freezing.

3.Packing damage: Freezing may cause the packaging to break or become brittle, which may result in contamination or leaks.

3.Reduced adherence: The eye patches' adhesive may become less effective after freezing, which might result in poor adhesion.

Method of using Liquorice Eye Patch

➢Preparation-

1.Wash your hands: Use soap and water to thoroughly wash your hands before putting on the eye patches.

2.Wash your face: To get rid of makeup, oil, and debris, wash your face with a mild cleanser.

3.Pat dry: Use a fresh towel to pat your face dry.

➢Application: -

1.Take the patches out of the packing: Take the eye patches out of the package with care.

2.Apply the patches: Starting in the inner corner and working your way outward, apply the eye patches beneath your eyes. To make sure the patches attach correctly, gently massage them onto your skin.

3.Eliminate air bubbles: Eliminate any air bubbles that could develop beneath the patches.

4.Unwind: As the eye patches do their job, unwind for 15 to 30 minutes.

➢Removal: -

1.Peel off slowly: Gently remove the eye patches from the outer corner of your eye after the allotted amount of time.

2.Discard: Throw away the used eye patches.

3.Moisturize: To hydrate and nourish your face, apply an eye cream or moisturiser.

➢Tips and precautions: -

1.Use as instructed: Adhere to the usage guidelines that came with the eye patches.

2.Don't touch: When the eye patches are in place, don't touch the region surrounding your eyes.

3.Avoid reusing: Reusing the eye patches increases the risk of infection and other problems.

4.Patch test: Before putting eye patches to the region under your eyes, conduct a patch test if you've never used them before.

5.Adverse reactions: Take off the eye patches right away and get medical help if you have any adverse responses, such as itching, redness, or swelling.

Targeted areas of Liquorice eye patches

1.Periorbital area: The region encompassing the orbit, canthus, and eyelids around the eyes.

2.Under-eye area: The region beneath the eye, which frequently has fine wrinkles, puffiness, and dark circles.

3.Eyelids: The eyelids, both upper and lower, might become swollen, dry, or irritating.

Eye patches can be made to target the following problems:

•Fine lines and wrinkles

•Dark circles and puffiness

•Dryness and irritation

•Redness and inflammation

Eye patches can be made to offer specific advantages and comfort for a range of eye conditions by knowing the anatomy of the eye and the tissues that surround it.

❖Is Liquorice is Good for Eye?

•Good. Skin tone will be brightened by its antioxidant qualities. It also helps minimize facial scars, wrinkles, and fine lines while protecting against pigmentation. Furthermore, you just need a tiny bit to apply it consistently!

❖How many times can we reuse eye patch?

•The under-eye patches can be used as frequently as desired during the week and at any time of day. When using sheet masks with powerful treatments like retinol, AHAs, and clay masks, it is advised to use the under-eye patches to protect the sensitive skin. Before using the under-eye patches, avoid using any kind of serum, essence, or cream as this may lessen their effectiveness. Because the under-eye patches are made especially for a single application, do not "reuse" them. Every time your eyes require a revitalizing dosage, apply a new set of eye patches. Even after the under-eye patches are removed, the skin still benefits from them, so wait before washing your face.

❖What is the purpose of under eye patch?

•The effects of a quality set of eye patches will be noticeable right away. Eye patches can help the eye region appear smoother, brighter, more alert, and fresher after ten minutes of use. They can also start to lessen the look of dark circles, under-eye bags, and fine lines and wrinkles around the eyes when used consistently over a 30-day period.

❖When to use under eye patches?

•Under-eye patches may be worn anywhere, at any time! Wear them as a revitalizing way to begin the day, as a calming self-care ritual during the day, before a night out in the evening, or before bed as part of your nightly routine.

❖Can you sleep with under eye patch on?

•Although it's a personal preference rather than a need, you can wear under-eye patches to bed. Because the serum in eye patches is made to seep into the skin fast, you might benefit from wearing them for a brief period of time. Your eye patches will dry out during your beauty sleep and may come off as a result of movement while you sleep. Wearing eye patches to bed won't hurt them, but it won't help them perform better either.

❖Do I use under eye patches before or after moisturizer?

•Apply eye patches before moisturizer: I advise using eye care products before to face moisturizer. Applying skincare products from the thinnest to the thickest formula will result in the optimum layering. Since moisturizers are often thicker than eye serums, I find that using eye patches for ten minutes and then using a moisturizer afterward works best.

❖Are under eye patches suitable for all skin types?

•Yes, using under-eye patches is beneficial for everyone. Eye patches are one of the greatest ways to help treat dry patches and dehydration lines around the eyes, which are common in dry and dehydrated skin

types. Regarding oily and mixed skin types, eye patches can rest securely on the skin without slipping or sliding about because the under eyes aren't a region that produces a lot of extra oil. Eye patches are especially helpful for mature skin since as we age, dark circles and weary eyes can become commonplace, and fine lines and wrinkles become more deeply entrenched.

❖What age should you start wearing under eye patches?

•You may start using eye patches at any age! You should start wearing eye patches in your 30s as this is usually the first time you will notice changes in your skin and the emergence of indicators of ageing. However, anyone of any age—even those in their late teens and twenties.

MATERIALS AND METHODS

Materials used in the formulation of eye patches are;

SL.No	MATERIALS USED
1	Liquorice extract
2	Aloe vera
3	Sandalwood oil
4	Glycerin
5	Gelatin
6	Distilled water

Table 1: List of materials used in the present work

LIQOURICE

Scientific classification of Liquorice

Kingdom: Plantae

Division: Angiosperm

Class: Dicotyledonous

Family : Fabaceae

Genus: Glycyrrhiza

Species: Glabra Linn

Fig:4

Liquorice is generally known as Licorice, Glycyrrhiza glabra, or Mulethi in Hindi. It is referred to as Yashtimadhu in Ayurveda. It is essential in Indian medicine, folk medicine, Ayurveda, and home medicines. A sweet flavor is extracted from Glycyrrhiza glabra roots. A sweet flavor is extracted from Glycyrrhiza glabra root. It is widely cultivated in Spain, Sicily, and Yorkshire. Glycyrrhizin, which is 50 times sweeter than sugar, is found in Liquorice.

Macroscopic characters

Odour- faint and characteristic

Colour- yellowish brown

Taste- sweet

Shape- Cylindrical

Size- 20-40 cm in length and 2cm in diameter

Liquorice contains a variety of chemical components used in cosmetics. Glycyrrhizin, liquirtic acid, and glycyrrhetinic acid are saponin triterpenes found in liquorice root extract, along with flavonoids, coumarins, starch, choline, tannins, amino acids, sugar, phytosterols, and bitter qualities. Liquorice root extract contains glabridin, which has the ability to block tyrosinase, the enzyme responsible for melanin production. Tyrosinase activity is lowered by additional active compounds found in liquorice extract, including glabrene, licochalcone A, and isoliquiritin. Liquiritin helps disperse melanin and promotes skin lightening.

It is frequently used in herbalism and traditional medicine and has ethno pharmacological properties. It possessed therapeutic qualities such as antibacterial, antifungal, anti-inflammatory, anti-ulcer, antiviral, antioxidants, skin whitening, anti- diabetic and anti-diuretic effects. Additional advantages include antidepressant, hypotensive, spasmolytic, hepatoprotective, and memory-enhancing activities. The root of licorice is regarded for its demulcent characteristics, which provide a relaxing and protecting effect.

While Liquorice can be useful in cosmetics, it can also create adverse effects, particularly when used in high concentrations or by people with sensitive skin. Possible negative effects of Liquorice in cosmetics include redness, inflammation, itching, burning, rash, and eczema.

ALOE VERA

Scientific classification of Aloe Vera

Kingdom: Plantae

Order: Asparagales

Division: Spermatophyte

Sub–division: Angiospermae

Class: Monocotyledonous

Genus: Aloe

Species: Barbadensis mill

Fig:5

Aloe vera, a natural product widely used in the field of cosmetology, and utilized for a health, beauty, medicinal, and skin care properties. The phrase "Aloe vera" is derived from the Arabic word "Alloeh", which means "shining bitter substance" and the Latin word "vera", which means "true".

Aloe Barbadensis Miller, the botanical name for aloe vera, is a member of the Liliaceae (Asphodelaceae) family. It is a perennial plant with thick fleshy leaves and clear gel in the inner leaf, which is well recognized for its medicinal and cosmetic benefits. The leaves can grow to be 24–36 inches long, and the outer portion of the leaves contains a yellow sap called latex. Aloe vera develops tubular yellow flowers that grow on spikes from the plant's center and appear primarily during the summer.

Aloe vera has a variety of chemical elements that are important in cosmetics, including vitamins, polysaccharides, enzymes, amino acids, minerals, salicylic acid, linin, and glycoprotein. The use of aloe vera into cosmetics products provides a wide range of advantages, from hydration and calming to anti-aging and anti-microbial actions, making it a flexible and valuable ingredient in skincare.

Cosmetic advantages of aloe vera include:

•Moisturizing: Aloe Vera's high water content hydrates skin without leaving it greasy, making it an effective moisturizer. It soothes and heals skin irritation, sun burn, and minor wounds.

•Anti-inflammatory: It lowers redness and swelling, making it effective for conditions like acne, eczema, and psoriasis.

•Anti-microbial: It aids in acne treatment, and bacterial infection prevention.

•Anti-aging: Beta-carotene, vitamin C, and vitamin E found in aloe vera are potent antioxidants that reduce fine lines and wrinkles.

GELATIN

Gelatin is a versatile and widely used chemical with important applications in pharmacology, cosmetics, and photography. Gelatin, derived from bovine collagen, is a protein-rich, translucent material recognized for its distinctive qualities such as gelling, stabilization, and thickening. This essay discusses the origins, manufacture, applications, and benefits of gelatin. Fig:6

Origins and Production

Gelatin is derived from collagen found in the skin, bones, and connective tissues of cows, pigs, and fish. The manufacturing process starts the preparation of raw materials, which are washed and soaked to remove contaminants. This is followed by hydrolysis, which degrades collagen into gelatin. The gelatin produced is subsequently purified, concentrated, dried, and powdered into a fine powder or sheets for commercial usage.

Applications of Gelatin

Gelatin can operate as a binding agent, holding the elements of a cosmetics product together. It is utilized in skincare products to promote skin elasticity, moisture, and texture. It's also utilized for nail and hair care. Gelatin is used in the pharmaceutical industry to manufacture capsules that preserve medications from moisture while also making them easier to swallow. Furthermore, gelatin-based wound dressings enhance healing due to their biocompatibility and moisture retention qualities. Gelatin aids the cosmetic sector as well, as it is utilized in skincare products and hair masks for its nourishing and strengthening properties. In photography, gelatin is used as a binder in film and paper

SANDALWOOD OIL

Fig:7

Scientific classification of Sandal wood oil:-

Kingdom: Plantae

Order : Santalales

Division: Maganoliphyta

Sub-divion : Magnolipsida

Class : Dicotyledonous

Genus : Santalum

Species : s. album

Family : santalaceae

Sandalwood oil is extracted from the heartwood of the sandalwood tree [Santalum album], is a valuable commodity known for its smell, therapeutic benefits, and cultural value. It is distinguished by its warm, woody, and earthy scent. Its primary chemical ingredients, such as alpha-sandalol and beta-sandalol, are responsible for its therapeutic properties. These chemicals possess anti-inflammatory, antibacterial, and antioxidant properties, making the oil extremely multipurpose.

Uses and advantages

•It is used to soothe inflamed skin, minimize acne, and improve the complexion.

•In Aromatherapy: It is used to reduce tension, anxiety, and insomnia.

•In Perfumery: Its long-lasting smell makes it used in perfume industry.

•Medicinal applications: In traditional medicine, sandalwood oil was used to cure ailments such as respiratory infections, digestive issues, and urinary tract disorders.

GLYCERIN

Glycerin, often known as glycerol, is a versatile and commonly used chemical. It is colorless, odorless, and viscous in nature. Glycerin, known for its pleasant flavor and non-toxic qualities, plays a key part in different industries, such as cosmetics, medicines, food, and biotechnology.

Fig:8

Glycerin is very hygroscopic, absorbing moisture from its surroundings. Because of its property, it is an excellent humectant, which is frequently used to soften and moisturize skin in skincare and personal care products.It is especially good for persons who have dry or sensitive skin because it helps to keep the skin hydrated and tight.

Glycerin, a popular cosmetic component, has several skin and hair care benefits due to its hydrating and protecting characteristics.

Here are its primary advantages in cosmetics:

•Hydration and moisturization: Glycerin functions as a humectant, attracting and retaining water on the skin. This helps to keep the skin hydrated, making it soft, smooth and supple.

•Enhances skin barrier function: Glycerin enhances the skin's natural barrier, from environmental damage, toxins, and irritation.

•Soothes dry and irritated skin: Glycerin effectively treats dry, flaky, or rough skin. It relieves inflammation and minimizes redness, making it ideal for sensitive skin.

•Anti-aging benefits: Using glycerin-based products regularly helps to improve skin elasticity and plumpness, reducing the appearance of fine lines and wrinkles.

•Acne reduction: Glycerin's non-Comedogenic nature means it won't clog pores, making it ideal for oily and acne-prone skin. It also reduces irritation linked with acne.

•Brightens skin: Glycerin promotes hydration and cell turnover, resulting in a natural glow and even skin tone.

•Hair benefits: Glycerin in hair care products conditions hair, prevents frizz, and improves manageability by keeping moisture.

METHODOLOGY

Collection of herbs

The herb to be used for this study was collected from the local herbal shop.

Preparation

•Preparation of Liquorice extract

15gm of Liquorice powder was taken and transferred into a beaker. 75ml ethanol was added to it and shakes continuously for 2hrs. Then it is filtered through a muslin cloth and stored.

•Preparation of Aloe vera extract

The fresh leaf of plant aloe vera was cut off from the base and washed well in order to remove any dirt and stand it upright in bowl or cup for 15- 30 minutes to remove yellow- tinted resin. Once resin was completely drained using a sharp knife the thick peel of aloe vera are peeled and transferred it into blender. The gel was blended for few seconds. Then the gel filtered and stored.

Eye patch formulation

•Weigh accurate grams of gelatin and transferred into a beaker.

•Liquorice extract, sandalwood oil, glycerin, and aloe vera are taken in a separate beaker.

•Place both beakers in water bath and heated to 70 c with constant stirring.

•Pour the mixture into gelatin and stir thoroughly.

•Then the mixture transferred to the mould and refrigerate for 24hrs.

•Carefully remove the eye patches from the mould.

•Pack the eye patches in suitable container with appropriate labeling.

•Store the eye patches in refrigerator.

Table 2: working formula of five formulations

Composition of cream formulation	**F1**	**F2**	**F3**	**F4**	**F5**
Liquorice extract	2ml	2ml	2ml	2ml	2ml
Aloe vera	8ml	7.5ml	6ml	7.7ml	7.1ml
Glycerin	3ml	3ml	3ml	3ml	3ml
Sandalwood oil	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
Gelatin	3ml	3.6ml	3.8ml	2.8ml	2.6ml
Distilled water	9ml	9ml	9ml	9ml	9ml

EVALUATION

The prepared Liquorice eye patches were subjected to following evaluation methods:

1.ORGANOLEPTIC PROPERTIES

The organoleptic properties such as colour, odour and texture of the prepared eye patches were noticed by visual and sensory inspection.

2.STABILITY STUDY

The fine formulation was stored for two days at room temperature in polyethylene packaging. Following this, the resulting product was examined visually for appearance and judged for both chemical (pH) and physical (color, odor, and texture) stability.

3.IRRITANCY TEST

Prepared eye patch is placed on the skin and held with the help of very thin cotton wipe. After an hour, it is removed and the effect on skin irritation is recorded.

4.pH OF THE EYE PATCH

The pH test for an eye patch is crucial to ensure the product's safety and compatibility with the skin. pH paper strips with a pH range of 3-10 were collected. Wet the eye patch with distilled water. Place the pH paper strip on the wet eye patch. Wait for 1-2 minutes for the color to develop. Compare the resulting color to the pH chart provided with the pH paper strips.

5.HOMOGENEITY

The Homogeneity test for an eye patch is crucial to ensure the product's consistency and quality.

6.VISUAL INSPECTION:

1.Appearance: Observe the eye patch's appearance, color and texture.

2.Uniformity: Check if the eye patch's thickness, shape and size are uniform.

7.AFTER FEEL

The cooling sensation and hydrating effect are checked after application.

8.FERRIC REDUCING ANTIOXIDANT POWER ASSAY (FRAP ASSAY)

Take 2ml of sample solution in a test tube. Then add 2.5ml phosphate buffer solution. Thoroughly mix the contents in the test tube. Then 2.5ml of 1% potassium ferricyanide solution, 2.5ml of 10% trichloroacetic acid is added to the mixture. Add 2.5ml de-ionized water to it. After this, 5ml ferric chloride was added to the test tube.

8.EYE MOVEMENT TEST

Assesses smooth pursuit and saccadic movements.

RESULT AND DISCUSSION

1. ORGANOLEPTIC PROPERTIES

All prepared formulation were observed for its organoleptic properties

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
Color	Pale yellow	Pale yellow	Pale yellow	Pale yellow	Pale yellow
Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
Texture	Gel like smooth and flexible	Gel like smooth and flexible	Gel like smooth and flexible	Gel like smooth and flexible	Gel like smooth and flexible

Table :3 Organoleptic property

2. STABILITY STUDY

There is no breakage and shrinkage observed in prepared formulation

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
Stability	No breakage but it's sticky	No breakage, No sticky &No shrinkage	Breakage and shrinkage	No breakage but it's sticky	Breakage and shrinkage

Table :4 Stability study

3.IRRITANCY TEST

During irritancy tests, the produced formulation exhibits no skin irritation, redness, edema, or inflammation. The skin can safely be treated with these formulas.

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
Irritancy	NIL	NIL	NIL	NIL	NIL

Table:5 Irritancy test

4.pH OF THE EYE PATCH

The pH of the formulations are found as:

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
pH	5	6	6	5	6

Table:6 pH test

Fig:9, pH=6

5. HOMOGENEITY

All prepared formulations were tested for its homogeneity. Homogeneity was confirmed by appearance and touch.

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
Homogeneity	Moderate	Good	Moderate	Good	Good

Table:7 homogeneity test

6.AFTER FEEL

Cooling sensation and hydrating effect were observed after application of eye patch

Parameter	**F1**	**F2**	**F3**	**F4**	**F5**
After feel	Cooling and hydrating effect	Cooling and hydrating effect	Cooling and hydrating effect	Cooling and hydrating effect	Cooling and hydrating effect

Table :8 After feel test

7.FERRIC REDUCING ANTIOXIDANT POWER ASSAY (FRAP ASSAY)

Antioxidant activity of prepared formulation was performed by using FRAP assay. In this assay resulting formulation was appeared as blue color due to the reduction of ferric to ferrous ion. Blue color indicates the presence of antioxidant activity.

Fig:10

8.EYE MOVEMENT TEST

Movement of eye was found to be smooth and coordinated.

Parameter	F1	F2	F3	F4	F5
Eye movement	Smooth & uncoordinated	Smooth & coordinated	Rough & uncoordinated	Smooth & uncoordinated	Rough and uncoordinated

Table:9 Eye movement test

DISCUSSION

•We were doing a project on formulation and evaluation of licorice eye patch.

•The ingredients used are licorice, aloe vera, gelatin, sandalwood oil, glycerin and distilled water for the formulation of eyepatch.

•Liquorice and Aloe Vera are widely recognized in the Indian traditional medical system for their therapeutic and cosmetic properties. The development and testing of a licorice eye patch is the current endeavour.

•Licorice and aloe vera is the natural product that is now a day frequently used in the field of cosmetology.

•The main ingredient in licorice that is responsible for its antioxidant activity is Glycyrrhizin.

•Glycyrrhizin has also antimicrobial and anti-inflammatory properties.

•Glycyrrhizin can capture solvated electrons, preventing molecular oxygen from capturing them.

•Licorice root also contains other compound with antioxidant properties, including flavonoids, isoflavonoids and chalcones.

•Glycyrrhizin is a triterpinoid saponin that is found in the root of the licorice plant, Glycyrrhiza glabra.

•Aloe vera includes mucopolysaccharides, which are small molecules that aid in preserving skin hydration. Aloe helps to produce collagen by stimulating fibroblasts. Skin becomes less wrinkled and more elastic as a result.

•Aloe vera's tyrosinase inhibitory compounds are utilized in cosmetic products as a skin- whitening agent to lessen skin pigmentation by reducing the synthesis of melanin.

•Aloe vera is a rich source of proteins, minerals, vitamins (including B1, B2, B3, B6, C, and folic acid), and carbohydrates (including muco polysaccharides).

•Skin is smoothed and moisturized by the healthy ingredients found in aloe vera.

•The classic smell of sandalwood oil is known around the world, the oil also being used as an ingredient base in countless products.

•Our study indicated that the formulation F2 was best among the five as it showed greater consistency and homogeneity during the whole period of study. Its ph was also in the ideal range.

•The formulated eye patch was found to be stable and efficacious, easy to apply and remove

•The evaluation result shows that the formulation is effective after usage.

SUMMARY & CONCLUSION

The aim of the present study is the formulation and evaluation of eye patch composed of Glycyrrhiza glabra. The Glycyrrhiza glabra and aloe vera in the eye patch holds enormous potential in the field of skin care. Eye patch was prepared by taking licorice extract, Aloe vera, glycerin, and sandalwood oil in one beaker and gelatin dissolved in water is taken in an another beaker, both these beaker heated to 75ºC.Then beaker containing licorice extract, Aloe vera, glycerin, and sandalwood oil is added to beaker containing gelatin solution and mix well. Then the solution was poured into the eye patch mould and kept in the refrigerator for 2 days. Five formulations F1, F2, F3, F4, and F5 were prepared by varying concentration of Glycyrrhiza glabra. The formulated eye patch was made to undergo a series of evaluation studies such as organoleptic properties, stability study, irritancy test, pH, homogeneity, FRAP assay, and eye movement, and found that the formulation F2 was the best among the five as it showed greater consistency and homogeneity during the whole period of study. Its pH was also in the ideal range of 3-10. The formulated eye patch was found to be stable and efficacious, easy to apply and remove. Since the method adopted for the study was simple and economic, this method may possess industrial scalability.

REFERENCE

1.Amar Surjushe, Resham vasani, D G Saple. Aloe vera: a short review; Indian Journal of Dermatology, 2008;53(4) page no:163-166.

2.Patibandla Shriya, B. Jahnavi Reddy,Dr. N.Srilakshmi: a short review of formulation and evaluation of poly herbal under eye derma gel; International Journal of Pharmaceutical Research and Application,2024;page no: 781-788.

3.Miss Sanskruti Vijay Khedkar, Prof. Rutuja Aher:Cosmetic hydrogel under eye patch: Review;2022; page no: 1621-1636.

4.Mamedov N.A., Egamberdieva D. Plant and Human Health. Volume 3. Phytochemical Constituents and Pharmacological Effects of Licorice: A Review; page no :1–21.

5.Hayashi H., Yokoshima K., Chiba R., Fujii I., Fattokhov I., Saidov M. Field survey of Glycyrrhiza plants in Central Asia: 2019; page no:534–539.

6.Fiore C., Eisenhut M., Ragazzi E., Zanchin G., Armanini D. A history of the therapeutic use of liquorice in Europe. J. Ethnopharmacol. 2005; page no:317–324.

7.Giulia Pastorino, Laura Cornara , Sonia Soares , Francisca Rodrigues , M Beatriz PP Oliveira ;Licorice (Glycyrrhiza glabra):A Phytochemical and pharmacological review;2018;page no:2323-2339.

8.Chevallier A. The encyclopedia of medicinal plants. Choice Rev. Online;1997; Page no:34-36.

9.Bukky Aremu, APRN — Written by Rachael Ajmera, MS,RD;a short review of Using Aloe Vera For Dark Circles Under the Eyes;2024.

10.Seblewongel Petros, Tamrat Tesfaye, Million Ayele ;A Review on Gelatin Based Hydrogels For Medical Textile Applications;2020;page no:43-70.

11.Yi Hu,Zhuxian Wang,Chunyan Shen,CuiPing Jiang; a short review on the Influence of the pKa value on the antioxidant activity of licorice flavanoids under solvent mediated effect;2023.

12.Amal S Chandran,Syam R J,Jojan J Jeron ,Sreeja Kaimal V; a review of Ethnopharmacological study about Glycyrrhiza glabra(licorice) based on ayurveda,An Indian System of Traditional Medicine;2022.

13.Revathi Sundaramoorthi, Madhavan K, Naresh R, Priyanka S, Ramyadevi S, Selvam B, Manivannan R; a short review on Physicochemical and Phytochemical Analysis of Glycyrrhiza glabra in Aqueous and Ethanolic Extract.

14.Adrienne Seitz, MS, RD, LDN, Kelli MC Grane ; Medical review on What Are The Licorice Root's Benefits and Downsides ; May 1,2024.

15.Naina Bhargava, Rachana Akhand Giri, Harshvardhan Dangi; a short reviw on Revitalizing Under-Eye Hydrogel Patches: Development and Assessment ;2024;Page no;2487-2493.

16.HR Petrosyan , AA Nigaryan , HA Hovhannisyan , AM Soloyan , VV Vardapetyan , AI Martiryan; Evaluation of antioxidant activity and heavy metals content in licorice (Glycyrrhiza glabra) ;2023;Page no;1-37.

17.Deepak Bhagat ; a short reviewon Aloe Vera For Dark Circles - Get-Rid Off From Under Eye Darkness;2023.

18.Amina Mudhafar Al-Nima, Zahraa Sedeeq Qasim, Myasar Al-Kotaji ; Formulation. evaluation and anti-microbial potential of topical Licorice root extract gel: Iraqi Journal of Pharmacy, 2020; Page no:37-56.

19.Vigneshwaran L.V., Senthil Kumar M. Yamuna M., Kamali S. ,Kathirvel B ; A Short review on Formulation and evaluation of herbal under eye derma gel: International Journal of Recent Scientific Research, 2021; Page no; 43787-43791.

20.Kosar Raoufinejad, Mehdi Rajabi, Golnaz Sarafian. Licorice in the Treatment of Acne Vulgaris and Post inflammatory Hyperpigmentation: A Review; Journal of Pharmaceutical Care, 2020; Page no;186-195

21.Arie Rakhmini, Faridha S. Ilyas, Sri Vitayani Muchtar, Ilham Jaya Patellongi. Kharuddin Djawad, Gemini Alam; International Journal of Medical Reviews and Case Reports, 2018; Page no:131-135.

22.Sathya S. Herath H.M.D.R. Amarasinghe N.R, Suraweera R.K; A short review on Formulation development of cream incorporating extracts of Glycyrrhiza glabra (Licorice); Pharmaceutical Journal of Sri Lanka, 2017; Page no;44-50.

23.Siti Umrah Noor, Faridah Michico ; A Short Review on Formulation of liquorice root extract (Glycyrrhiza glabra 1.) as skin whitening cream; Indonesian Journal of Plant Medicine, 2016; Page no;93--99.

24.B.M.Gupta. K.K Mucen Ahmed, Ritu Gupta. Glycyrrhiza glabra (Medicinal Plant) Research: A Scientometric Assessment of Global Publications Output during 1997- 2016: Pharmacognosy Journal, 2018; Page no: 1067-1075

25.Deeksha Sharma, Priyanka Namdeo, Priti Singh.; Phytochemistry & Pharmacological Studies of Glycyrrhiza glabra: A Medicinal Plant Review: International Journal of Pharmaceutical Sciences Review and Research, 2021; Page no: 187-194.

26.Md. Kamrul Hasan, Iffat Ara, Muhammad Shafiul Alam Mondal, Yearul Kabir ; Phytochemistry, pharmacological activity, and potential health benefits of Glycyrrhiza glabra, Heliyon, 2021.

27.Priyanka Sharma, Amit C Kharkwal, Harsha Kharkwal, M Z Abdin, Ajit Varma ; A Review on Pharmacological Properties of Aloe vera, International Journal of Pharmaceutical Sciences Review and Research, 2014, Page no:31-37.

28.Arup Jyoti Pegu, Mrs. Ankita Sharma. A Review on Aloe Vera; International Journal of Trend in Scientific Research and Development,2019,Page no:35-40.

29.Efterpi V. Christaki, Panagiota C. Florou-Paneri Aloe vera: A plant for many uses: Journal of Food, Agriculture & Environment, 2010, Page no: 245-249.

30.Davinder Kumar, Gajendra Rajora, Om Parkash, Himanshu, Mamta Antil, Virender Kumar. Herbal cosmetics: An overview, International Journal of Advanced Scientific Research, 2016;Page no: 36-41.

31.https://images.app.goo.gl/4c6bRKEKfuyQAWay7

32.https://images.app.goo.gl/nLMSryYJpU9RDC6d7

33.https://images.app.goo.gl/NedU7WpcdfYVXWXp6

34.https://images.app.goo.gl/hruTnxia96c65cHf7

35.https://images.app.goo.gl/WC6PunT8mK6b1Tv78

36.https://images.app.goo.gl/h8Hs33EL6KMQDJW28

37.https://images.app.goo.gl/5Qz4i345z92sWXmL6

38. https://www.istockphoto.com/photo/fresh-dissected-aloe-vera-stacks-isolated-on-white-background-gm1338025183-418741261

39. https://images.app.goo.gl/8HVkTzgeSg2vHniBA