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Formulation And Characterisation of Transition Lotion Using Red Clover

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ABSTRACT

Body lotion is a type of skincare product formulated with a light weight, lotion like consistency, provide hydration soothing, moisturizing. The project aims to formulate a transition body lotion using red clover as the active ingredient for various skin concerns, with a particular focus on dry skin, including that experienced by transgender individuals, especially those undergoing hormone replacement therapy (HRT), and the general population. The main objective was to formulate a multifunctional skin care product which offers moisturizing. The lotion was prepared by using red clover and aloe vera and hyaluronic acid and other ingredients in specific quantities. Incorporating formulation was done by aqueous extract of red clover, aloe vera, snail mucin, and glycerin into oil phase of shea butter, emulsifying wax, almond oil. Four formulations were prepared by varying the concentration of the ingredients. The formulations were evaluated for organoleptic properties, pH, irritancy, spreadability, viscosity to ensure product quality and consistency. The formulation F4 was found to be the best among the four preparations as it shows better spreadability and consistency. The result demonstrated the successful development of a topical body lotion with a uniform red clover have ideal pH, good spread ability, smooth texture. The findings suggest that the developed body lotion to be a stable, safe, effective skin care products which can deliver multiple benefits. The developed formulations hold promise as a natural, effective and high-quality addition to skin care routines. Further research and clinical studies are required to explore the efficacy and safety of the formulation in larger population.

INTRODUCTION

The term cosmetic originates from the Greek word kosmetikos meaning to adorn or to beautify referring the art of preparing and applying products to enhance one's appearance. Cosmetics are defined as substances or preparations intended for external application to the body, including the skin, hair, nails, lips and eye to promote cleanliness, attractiveness and overall wellbeing.

All cosmetic preparations are designed for temporary or prolonged use to enhance physical appearance promote skin health, and even have a psychological impact on oneself and others influencing confidence, self-esteem and social interactions.

In India, cosmetics are governed by the drug and cosmetics act 1940 and the notified through Gazette notification GSR 426, ensuring their safety, quality and efficacy for consumer use.

LOTION

Lotion is a versatile and essential product in personal care, serving a range of purpose from hydration to protection and healing. Its formulation typically combines water, oils, and other beneficial ingredients to create a lightweight, easily spreadable substance that caters to various skincare needs. Lotions are widely used for both medicinal and cosmetic purposes, highlighting their significance in everyday life.

The primary purpose of lotion is to moisturize the skin. By replenishing lost moisture, lotions help maintain the skins natural barrier, preventing dryness, flakiness, and irritation. Regular use of lotion can keep the skin soft, smooth, and healthy, especially in harsh weather conditions that tend to dry out the skin.

In addition to hydration, lotions offer protection and healing properties. Many are enriched with ingredients like vitamins, antioxidants and SPF, which protect the skin from harmful UV rays and environmental pollutants. Some formulations are especially formulated to address specific skin concerns such as eczema, psoriasis, or acne, incorporating active ingredients like salicylic acid, ceramides, or colloidal oatmeal to provide relief and promote healing.

Types of lotion

Lotions come in various types, each tailored to different needs. Body lotions are designed for larger areas of the body, focusing on hydration and protection. Hand lotions are more concentrated, targeting the hands that are often exposed to frequent washing and environmental elements. Facial lotions, on the other hand, are lightweight and non- comedogenic, formulated to cater to the delicate skin on the face.

There are also specialized lotions such as baby lotions, which are gentle and free from harsh chemicals, and therapeutic lotions, which are prescribed to treat medical conditions. The market further diversifies

with scented and unscented lotions, allowing users to choose products based on personal preference and sensitivities.

Ideal characteristics of lotion

- Hydrating
- Lightweight
- Absorbent
- Nourishing
- Protective
- Soothing
- Non-comedogenic
- Long lasting

TRANSITION LOTION FOR TRANSGENDER

Transition lotion are specific and curated skincare products designed to meet the needs of transgender women. Transition Body Lotion is designed to deeply nourish and repair the skin's barrier to prevent dullness and dryness. They are specially designed or recommended skincare products that address the unique challenges faced by transgender individuals, particularly those undergoing hormone replacement therapy (HRT). Hormonal changes induced by HRT can significantly impact the skin, undergoing oestrogen therapy, the skin may become softer, thinner, and more sensitive. This increased sensitivity makes the skin prone to dryness and irritation, necessitating the use of moisturizing and soothing products.

Red clover contains Phytoestrogens, such as isoflavones, mimic oestrogen in the body.
isoflavones promotes smoother and more natural transitioning journey. Red clover may enhance skin softness, hydration, and elasticity due to its oestrogen-like effects, supporting the overall feminization process. Red clover can be beneficial for transgender skin, particularly for hydration, anti-aging, and soothing properties. However, its phytoestrogen content means it may influence hormonal balance.

RED CLOVER

fig 2: Red clover

Scientific name: Trifolium pratense

Family: Fabaceae

Red clover extract is obtained from the flowering tops of the plant trifolium pratense. It has many health advantages, especially in cosmetics. It is rich in minerals, antioxidants and phytoestrogens, so it's an excellent ingredient for skin renewal.

Advantages

- Nutrient-rich.
- Good for anti-aging.
- Moisture retention and hydration.
- Brightening with uniform skin tone.
- Diy skincare recipes.

To restore dry and lifeless skin, combine hydration techniques with herbal therapies and follow a proper skincare routine. Suitable hydrating ingredients focusing on moisture control can help you to revitalize your skin and achieve a glowing healthy complexion.

Red clover is a plant known for its nutritional and medicinal properties. It contains several bioactive constituents, including;

- **Isoflavones** (Phytoestrogens)

  These compounds have oestrogen-like effects in the body and are often used in managing menopausal symptoms, bone health and cardiovascular health.

- **Flavonoids such as Kaempferol and Q**

  These are antioxidants that contribute to red clover's anti-inflammatory and cardioprotective properties.

- **Coumarins**

It includes Coumarin and Umbelliferon.

These compounds may help improve circulation and have mild anticoagulant properties.

- **Volatile Oils**

  They contain volatile oils including Eugenol and methyl salicylate.

  Volatile oils contribute to its aroma and potential anti-inflammatory effects.

- **Tannins**

  Tannins include Ellagic acid and gallic acid.

  It has astringent property.

- **Amino Acids**

  It constitutes of essential amino acids.

- **Vitamins and Minerals**

  It includes vitamins C, vitamin E, Calcium, Magnesium, Potassium, Phosphorus.

  These nutrients support general health and wellbeing.

- **Polysaccharides**

  These contribute to its immune-modulating properties.

RED CLOVER – BENEFITS

1.Anti-inflammatory properties

Red clover contains bioactive compounds like flavonoids and isoflavones that reduce inflammation, making it suitable for soothing irritated skin and managing conditions such as eczema, dermatitis, and psoriasis.

2.Antioxidant Protection

Isoflavones in red clover neutralize free radicals, preventing oxidative stress that can lead to premature aging, fine lines, wrinkles, and dull skin.

3.Skin Hydration and Soothing

Red clover extract is known for its moisturizing properties, helping to hydrate dry, skin and restore its natural barrier. It provides soothing effect to skin.

4. Anti-Aging Benefits

Phytoestrogens constituent in red clover extract stimulates collagen production and improves appearance of skin, elasticity and firmness.

5. Detoxifying Effects

Red clover promote detoxification, which can help to clear skin impurities and improve complexion.

6. Wound Healing and Repair

Tannins and other compounds in red clover promote healing of minor wounds, cuts, and abrasions, making it useful in lotions for damaged or irritated skin.

7. Hormonal Skin Benefits

Its phytoestrogens can help balance hormonal fluctuations that lead to acne or other skin issues, particularly in menopausal or perimenopausal individuals.

8. Acne and Skin Irritation Relief

Red clover may help reduce bacterial growth on the skin, potentially preventing acne breakouts.

ALOE VERA

Fig 3: Aloe vera

Botanical name: Aloe barbadensis miller

Family: Liliaceae

Chemical constituents: vitamins, polysaccharides, glycoproteins, enzymes, amino acids, minerals, salicylic acid, lignin.

Aloe Vera is a succulent plant species. The genus name aloe comes from the Arabic word alloeh, meaning bitter and shiny substance. The species Vera comes from the Latin word vernus meaning true. The leaves of aloe Vera contain polysaccharide gel ace Manan, which can be used for topical administration. Many products are available in the market which contain aloe Vera as an ingredient such as lotion, ointment, gel for insect bite, minor burn etc. Aloe Vera contain monopolysaccharide that helps in dry skin condition by binding moisture to the skin. They also stimulate collagen and elastin Fibers. Aloe Vera also has a cooled effect that can reduce itchiness and redness. Aloe Vera helps to keep the skin hydrated and also helps to treat dry skin. They also diminish age lines. People with sensitive skin may experience burning

while applying aloe Vera. Allergic reactions are sometime seen in people, but generally they are very safe for topical administration.

GLYCERINE

Fig 4: Glycerine

Glycerine also referred to as glycerol, is a poly compound with a simple molecular structure. Glycerine is a high purity, hygroscopic, clear and nearly colourless liquid, ideal for pharmaceutical and food applications where a neutral taste and odour are essential. Glycerine exhibits exceptional safety profiles, being virtually nontoxic when ingested and non-irritating to the skin and sensitive tissue, unless used in extremely high concentration which may cause dehydration.

Glycerine's exceptional hygroscopicity, which enables it to absorb and retain moisture from the air is one of its most beneficial and versatile properties. Its humectant properties which allow it to retain moisture make it an ideal conditioning agent in various applications where both glycerine and its retained water content serve as effective plasticizers. The ultimate result is that products exhibit enhanced softness, flexibility and creaminess, while also enjoying an extended shelf life, making glycerine an invaluable ingredient in a wide range of formulations.

USE

* It serves as a protective emollient not only moisturizing and soothing the skin, but also providing antimicrobial benefits that help shield the skin from harmful microorganisms.

* It is used in food industry as a sweetening agent

* It is used as a thickening agent

SNAIL MUCIN

Fig 5: Snail mucin

Snail mucin is a naturally occurring protective substance produced by snails, serving as a lubricating barrier to help shield their skin. The mucin secreted by a snail's foot enable it to adhere securely to surface facilitating smooth movement, effort less gliding and even upward climbing without losing traction.

Snail mucin produced on the snails back offers dual benefits intense hydration to safeguard the snail's body and potent antimicrobial properties to defend against germs, infections and environmental stressors. Snail mucin and extract have garnered significant at tension in dermatology with application spanning from wound healing in burn patients to everyday skincare routines, where they are touted for their anti-aging and anti-acne benefits.

HYALURONIC ACID

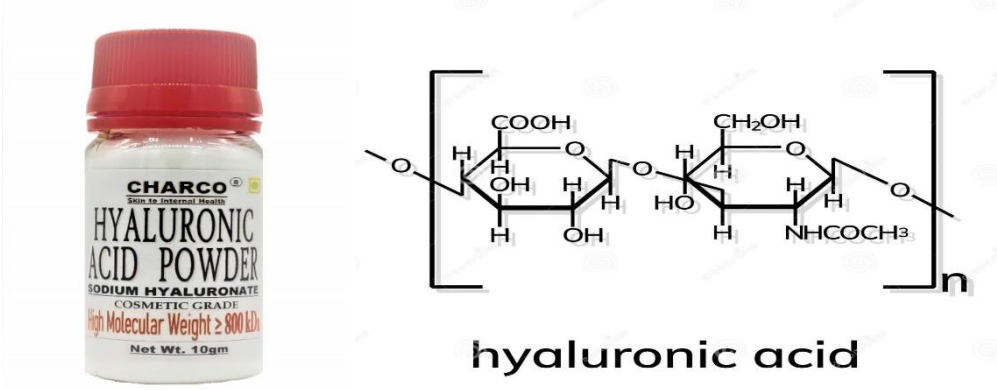

Fig 6: Hyaluronic acid

Hyaluronic acid is an anionic nonsulfated glycosaminoglycan that is a naturally occurring molecule that is found in connective, epithelial and neutral tissues. Hyaluronic acid has powerful humectant property, helps to retain water and keeps the tissues well lubricated. It also holds anti-aging and wound healing properties. Large scale production of hyaluronic acid is through extraction from animal tissues. Hyaluronic acid is used in cosmetic and therapeutic applications. It focuses on improving skin elasticity, reducing hyperpigmentation, treating uneven skin tone, and preventing fine lines and wrinkles. Other benefits associated with hyaluronic acid is that it reduces acid reflux, soothes dry eyes, promote tissue regeneration and regulate inflammation. Side effects associated with hyaluronic acid are rare but may cause allergic reaction to people with sensitive skin, which may also be associated with swelling and breathing difficulties.

ALMOND OIL

Fig 7: Almond oil

Almond oil is a natural oil made from sweet almonds. It has both cosmetic and therapeutic applications. Almond oil entails vitamins, antioxidants and fatty acids which aids in moisturizing the skin, reduce wrinkles and improve the skin elasticity. It also has anti-inflammatory action which helps to treat eczema and psoriasis. It can also use to reduce the appearance of dark circles and puffiness around the eyes due to its high vitamin E content present in it. The anti-bacterial activity of almond oil deal with the emergence of acne. It also acts as an immunity booster, increase good cholesterol level. Generally almond oils are considered safe but at times may cause allergic reactions such as skin irritation, contact dermatitis, anaphylaxis and can also cause acne breakouts.

EMULSIFYING WAX

Fig 8: Emulsifying wax

Emulsifying wax is a mix of fatty acid and emulsifiers. It is derived from plant based or petroleum sources. It is of white, odourless in nature. It is a common ingredient used in cosmetics and skin care formulation to blend water and oil, forming a stable smooth emulsion. It is used to prevent phase separation. It is mainly included in lotion, cream, hair conditioners.

Key properties

Emulsification: to make a mix of oil and water phase

Stabilization: to prevent separation of emulsion

Texture enhancement: to provide smooth creamy consistency

SHEA BUTTER

Fig 9: Shea butter

Shea butter is a fat extracted from the seeds of vitellaria paradoxa. It is used in making cosmetics and food industry. It is mainly available in West Africa. It consists of great variability of its quality. This variability depends on area of origin, method of production, storage conditions. The colour varies from creamy white to pale yellow. Pale yellow colour is of unrefined butter while white colour is refined. It has been used by people as moisturizer. Nowadays it is a common ingredient in skin care products. It works as emollient, softens and hydrates skin. It contains several ingredients like stearic acid, oleic acid, palmitic acid, linoleic acid, vit a and B.

Skin care benefits

- Act as great moisturizer

- Lighten stretch marks, dark spots and acne scars
- Provide more even toned skin
- Reduce wrinkles and fine lines
- Treat skin conditions like eczema
- To heal blemishes
- Anti-aging

RELEVANCE OF THE STUDY

The study on formulation and characterisation of transition lotion is highly relevant as there is increased consumer preference for safe and effective natural skin care products. It contributes to growing sector of cosmeceuticals by combining botanical and biological ingredient in a proper formulation. This study focuses on development of product using red clover, aloe vera, hyaluronic acid, these ingredients are well known for their multiple skin benefits. Transition lotions are designed to address the skin's changing needs, providing hydration, nourishment, and protection. The skin often becomes dry, irritated, or dull due to environmental changes, aging, or hormonal fluctuations. A well-formulated transition lotion ensures the skin remains balanced and resilient, preventing long-term damage and promoting healthy skin renewal.

Ingredients and their benefits

Red clover is a natural source of isoflavones, it promotes collagen synthesis, improve skin firmness and reduce appearance of fine lines. Isoflavones enhance skin ability to retain moisture and manage dryness commonly seen in transitional skin stages. Red clover is known for its phytoestrogen content, which mimics oestrogen to improve skin elasticity and reduce signs of aging. It shows antioxidant property by providing protection against free radical. This will reduce premature aging, prevent damage to skin cells and to maintain youthful appearance. Red clover helps soothe inflamed, irritated skin due to anti-inflammatory compounds. Red clover enhances skin firmness and reduce wrinkles when paired with hydrating agents like hyaluronic acid.

Aloe vera contain mucopolysaccharide, which helps to retain moisture, impart deep hydration to skin. Aloe vera possess compounds such as salicylic acid, sterols and various enzymes that possess anti-inflammatory property. Aloe vera contains anthraquinones (aloin and emodin) and saponins, helps in reducing acne and thereby maintaining clearer skin. Aloe vera also lightens pigmentation. Combining both, synergistic effect can be achieved leading to brighter complexion and reduced appearance of hyperpigmentation and acquiring more even skin tone. It contains vitamins, enzymes, and minerals that help heal and rejuvenate the skin, making it an ideal component for calming irritation and maintaining moisture balance. Aloe vera

works as a soothing base by enhancing absorption of hyaluronic acid and red clover extracts.

Hyaluronic Acid is a glycosaminoglycan which is present naturally in skin. It retains water, provide intense hydration. It plumps the skin and reduce the appearance of fine lines and wrinkles. It enhances the wound healing and skin regeneration. Hyaluronic acid on combination with aloe vera and red clover, maximizes hydration and amplifies antiaging effects.

Glycerine is a humectant that draws moisture from the air into the skin, ensuring hydration and a smooth texture. It also enhances the skin's barrier function.

Shea butter is a rich emollient that provides deep nourishment and protection. Packed with vitamins A and E, it supports skin repair, reduces dryness, making it a key ingredient for transition lotions. Almond oil is lightweight yet deeply nourishing. Rich in vitamin E, it softens the skin, improves complexion, and provides antioxidant benefits.

Combined Effects

Hydration and Elasticity: Hyaluronic acid provides deep hydration, Aloe vera soothes and locks in moisture, and red clover promotes collagen synthesis for improved elasticity.

Anti-Aging: Isoflavones in red clover complement the plumping effects of hyaluronic acid, reducing wrinkles and improving skin texture.

Healing and Inflammation: Aloe vera’s anti-inflammatory and wound-healing properties are enhanced by red clover's antioxidant effects and hyaluronic acid’s tissue-regenerating abilities.

Brightening and Balancing: Aloe vera’s vitamins and red clover’s hormone-balancing properties can improve skin tone and manage blemishes.

AIM AND OBJECTIVES

AIM

The aim of the study is the formulation and characterisation of transition lotion containing red clover as active ingredient.

OBJECTIVES

The objectives of the study were following,

- To formulate a transition lotion
- To explore the benefits of red clover.
- To promote skin health
- To standardise the formulation process

- To assess the efficacy and safety of lotion.
- To promote herbal skincare products.
- To formulate 4 different formulations by varying the concentration of ingredients.
- To understand the formulation study
- To find out best formulation from the product obtained by evaluation parameters.

PLAN OF THE WORK

The plan of work was as follows:

1. Review of Literature
2. Preformulation study of drug and excipients
   - Solubility
   - Organoleptic appearance
   - Effect of light
   - Hygroscopicity
3. Formulation of lotion
4. Evaluation of lotion
   - Organoleptic properties
   - Homogeneity and transparency
   - Appearance and consistency
   - Selection of best formula
   - pH Measurement
   - Irritancy test
   - Spreadability test

PREFORMULATION STUDY OF DRUG AND EXCIPIENTS

Preformulation study is defined as a laboratory study to determine the characteristics of active ingredient and excipients. It is a very important part of drug development process. Preformulation study ensures safety, quality, stability and bioavailability of the formulation.

Preformulation studies are conducted to the following in drug development process:

- To ensure the physical and chemical stability throughout its shelf life.
- To analyse the compatibility of the drug with excipients.
- To understand the physical as well as the chemical properties of the drug.

- To enhance the bioavailability of the drug.

ORGANOLEPTIC CHARACTERS

MATERIALS	COLOUR	ODOUR	TASTE	TEXTURE
RED CLOVER	Light brown powder	Mild, hay like or grassy smell	Slightly sweet with earthy	Fine and dry
HYALURONIC ACID	Transparent or white	Odourless	Mild sour	Smooth, slippery, gel like when hydrated
ALOE VERA	Colourless to pale yellow	Slightly herbal	Slightly bitter	Smooth, sticky gel like
SNAIL MUCIN	Transparent	Mild earthy or slightly marine like smell	Slightly tangy	Slippery, slimy and viscous

SOLUBILITY

The solubility test for the active ingredient and excipient was performed using water and methanol at 70 degrees Celsius to find out any solubility issues, crystal growth etc. It is observed that the red clover is soluble in methanol and hyaluronic acid in water.

HYGROSCOPICITY

It is the ability of a substance to absorb moisture from the air. Drugs and pharmaceutical substances can absorb moisture from the air, which can affect their physical and chemical properties therefore, it is very important to know the hygroscopicity of the drug. In this study, the solid ingredients were kept at room temperature for a fixed period of time in order to detect the Hygroscopicity.

EFFECT OF LIGHT

Light plays an important role in stability and efficiency of a drug. Some drugs can undergo degradation when exposed to the light; therefore, it is very important to know the effect of light on the drug. The drug was exposed to the natural day light under room temperature for certain period of time. No effect on the drug and excipients were observed.

MATERIALS

Table 1: List of materials used in the present work

SI NO	MATERIALS
1	DISTILLED WATER
2	ALOE VERA
3	RED CLOVER
4	GLYCERINE
5	HYALURONIC ACID
6	SNAIL MUCIN
7	ALMOND OIL
8	SHEA BUTTER
9	EMULSIFYING WAX
10	ROSE OIL
11	PROPYL PARABEN

METHODOLOGY

MATERIAL COLLECTION

Red clover, hyaluronic acid, snail mucin was brought from an online shopping application. Other materials were brought from a nearby shop in Cherthala.

PREPARATION OF METHANOL EXTRACT OF RED CLOVER

2.5 g of red clover powder was accurately weighed and transferred into a beaker. 25ml of methanol was added to it. The mixture was stirred and warmed to 60℃. The resulting solution is then filtered through

a filter paper. The filtered extract was stored in a tightly closed, dark glass container and kept in cool place.

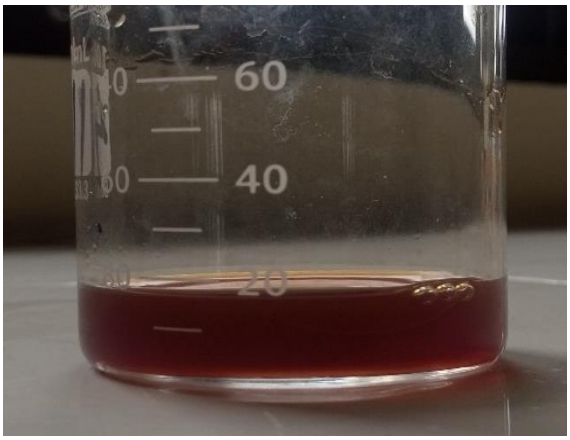

Fig10: Red clover extract

PREPARATION OF RED CLOVER TRANSITION BODY LOTION

- **Extraction of Red Clover**

Red clover powder is mixed with methanol and gently heated over a direct flame at approximately 60°C for a few minutes. The heated solution is then filtered to separate and collect the extract.

- **Preparation of the Aqueous Phase**

1. In a beaker, mix the red clover extract thoroughly with aloe vera gel.
2. Add glycerine to the mixture.
3. Incorporate distilled water into the solution.
4. While heating the solution in a water bath at 70°C, gradually add hyaluronic acid powder.

- **Preparation of the Oil Phase**

1. In a petri dish, combine almond oil with shea butter.
2. Introduce an appropriate amount of wax into the mixture.
3. Heat the mixture in a water bath until it reaches 70°C.

- Once both the aqueous and oil phases reach 70°C, blend them together using the oil-in-water emulsification technique. Ensure thorough mixing to achieve uniform distribution and prevent lumps.
- Add snail mucin and preservatives while using a propeller mixer to maintain consistency.
- Incorporate a few drops of rose oil for fragrance.
- Transfer the final lotion into a suitable container and label it accordingly.

WORKING FORMULA OF FOUR PREPARATIONS

Table 2: working formula four formulations

SI NO	MATERIALS	F1	F2	F3	F4
1	DISTILLED WATER	63ml	64ml	64ml	60ml
2	ALOE VERA	10 g	10g	10g	10g
3	RED CLOVER	4ml	5ml	5ml	9ml
4	GLYCERIN	3ml	3ml	3ml	3ml
5	HYALURONIC ACID	0.5g	1g	1.5g	2g
6	SNAIL MUCIN	1ml	2ml	5ml	5ml
7	ALMOND OIL	7ml	5ml	4ml	4ml
8	SHEA BUTTER	5g	4g	3g	3g
9	EMULSIFYING WAX	5g	5g	3g	3g
10	ROSE OIL	q. s	q. s	q. s	q. s
11	PROPYL PARABEN	q. s	q. s	q. s	q. s

q.s- quantity sufficient

EVALUATION TEST FOR TRANSITION LOTION

I. ORGANOLEPTIC PROPERTIES

All prepared formulations were evaluated for its organoleptic properties for its colour, odour and texture.

II. TYPE OF EMULSION -DYE TEST

A few drops of safranin dye were taken and mixed it with little amount of lotion. A drop of this solution placed on microscopic slide and cover it with cover slip on microscopic observation if red coloured globules found to be dispersed in colourless background, then the lotion is water in oil type emulsion, if colourless globules dispersed in red background, then the lotion is oil in water type.

III. HOMOGENEITY AND TRANSPARENCY

Homogeneity assessment of all the prepared formulas of transition lotion was done. Examinations were done by filling the lotion in container and viewing against white and black background for their colour, appearance and presence of any aggregates.

IV. PH MEASUREMENT

The pH meter was calibrated using a buffer solution. Accurately weighed 0.5 g of formulation and dissolved in 50 ml of distilled water. pH was measured after 2 hours.

V. IRRITANCY TEST

The prepared formulation was applied on the back side of the left hand and evaluated for irritation on applied area, eczema and other rashes within 24 hours after application.

VI. STABILITY STUDIES

Phase separation; the prepared formulation was kept aside from sunlight. Then the phase separation was observed every 24 hours for 30 days.

VII. SPREADABILITY

The spread ability of the prepared formulation was evaluated. 0.5g of the preparation was placed within a circle of diameter 1cm on a glass slide, over which a second glass plate was placed. Additional weight of 500g was allowed to rest on the upper glass slide for 5 minutes and the diameter was measured. Spread ability can be determined by using the formula:

$S=d^2\times \pi/4$

Where, S= spreading area depending on mass (mm^2)

d= spreading area diameter (mm)

VIII. 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.

IX. VISCOSITY

Viscosity of the prepared formulation was evaluated with Brookfield viscometer. The lotion was rotated at 100 rotations per minute, using the spindle LV-61 the corresponding dial reading was recorded.

X. ACID VALUE

1. Standardization of 0.1N KOH

Weigh accurately 0.63 gm of oxalic acid. Transfer to 100ml standard flask and makeup the volume. Pipette out 20ml of this solution into a conical flask and add 2 drops of phenolphthalein and titrate it against 0.IN KOH. End point is the appearance of pale pink colour.

2. Determination of Acid value

Weigh accurately 5gm of oil and dissolve it in a mixture of 12.5ml of ether and alcohol which was previously neutralized with 0.1N KOH to phenolphthalein. Shake well until the sample dissolve. Add phenolphthalein indicator and titrate it against 0. IN KOH until the solution become pale pink colour.

Acid Value = (5.61 x Titre Value x Actual Normality) / Weight Taken

RESULTS AND DISCUSSION

I. ORGANOLEPTIC PROPERTIES

All prepared formulation were observed for its organoleptic properties.

Parameter	F1	F2	F3	F4
Color	Light Beige	Light Beige	Light Beige	Light Beige

Table 3:

Odor	Pleasant	Pleasant	Pleasant	Pleasant
Consistency	Thick	Good	Good	Very good
Texture	Rough	Smooth	Smooth	Smooth

organoleptic properties of lotion

II. TYPE OF EMULSION -DYE TEST

The prepared solution shows white colour globules in red background. It shows preparation is oil in water type emulsion.

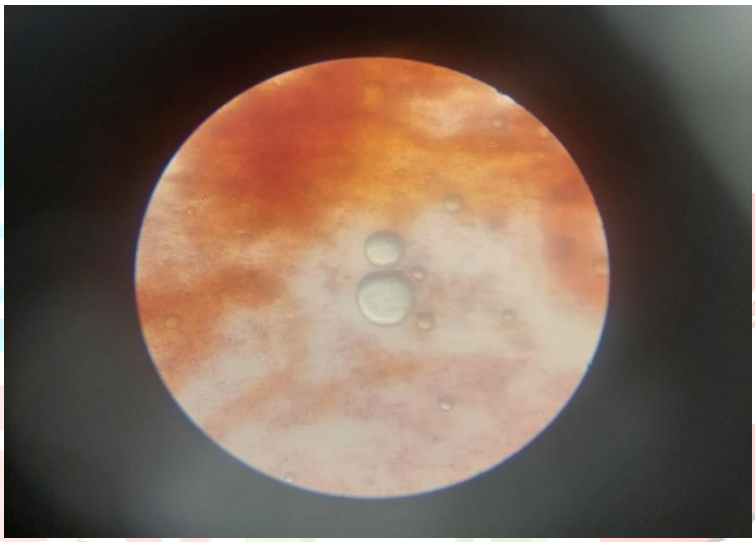

Fig 11: Dye test

III. HOMOGENEITY

All prepared formulation tested for homogeneity by touch and appearance.

Parameter	F1	F2	F3	F4
homogeneity	moderate	good	Very good	Very good

Table 4: Homogeneity of lotion

IV. pH OF LOTION

The pH of the lotion was found in the range of 4.5 -5.5 which is good for skin pH.

parameter	F1	F2	F3	F4
pH	4.91	5.19	5.2	5.26

Table 5: pH of lotion

Fig 12; pH of lotion

V. IRRITANCY TEST

The prepared formulations show no redness, oedema, inflammation and irritation within 24-48 hours after application. The absence of irritation or allergic reactions suggests that the prepared lotion is safe to use on skin.

Parameter	F1	F2	F3	F4
irritancy	nil	nil	nil	nil

Table 6: irritancy of lotion

VI. STABILITY STUDIES

There is no phase separation occur in prepared formulation.

Parameter	F1	F2	F3	F4
Stability	No phase separation	No phase separation	No phase separation	No phase separation

Table 7: stability studies

VII. SPREAD ABILITY TEST

All the prepared formulations were tested for its spread ability. In this test, the area covered by fixed amount of sample after uniform spread of the sample on the glass slide is calculated.

parameter	F1	F2	F3	F4
spread ability(mm^2)	78.5	63.58	52.78	42.98

Table 8: Spread ability of lotion

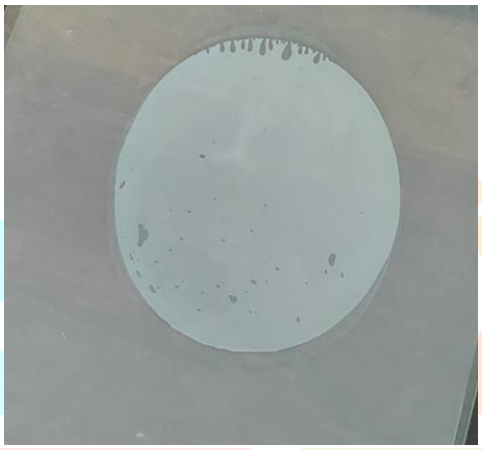

Fig13: spread ability test

VIII. 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 colour due to the reduction of ferric to ferrous ion. Blue colour indicates the presence of antioxidant activity.

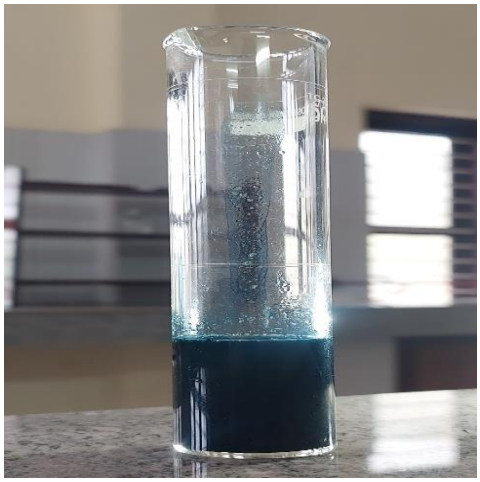

Fig14: antioxidant test

IX. VISCOSITY

Viscosity of the prepared formulationF4 was evaluated with Brookfield viscometer. The sample was rotated 100 rotations per minute using the spindle LV -61.

The viscosity of f4 formulation was found to be 33.9 Cp.

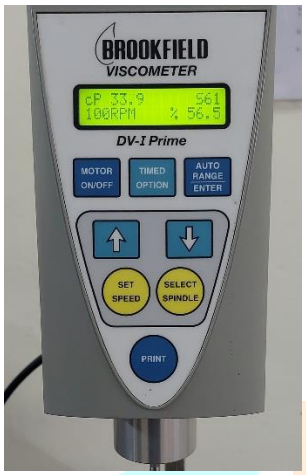

Fig15: viscosity

X. ACID VALUE

Standardisation of 0.1 N KOH = 0.097N

ASSAY

Si no	BURETTE READING		Final value
	Initial reading	final reading	
1	0 ml	1 ml	1 ml

Table 9; Determination of acid value

Acid value of given formulation F4 was found to be 0.01 mg.

SUMMARY AND CONCLUSION

The present work has been undertaken with the aim of preparing a transition body lotion containing red clover extract and snail mucin as a revitalizing skin and brightening formulation along with hyaluronic acid and evaluating its physical properties. Red Clover is one of the most potent ingredients in skin care and offers several benefits when incorporated into the body lotion. Hyaluronic acid is among the most widely used ingredients in skin care due to its several benefits. The aim of this work is to create

multifunctional skin care products with the synergistic benefits of red clover, hyaluronic acid, aloe vera, and other ingredients to improve overall skin health and appearance.

The lotion was formulated by incorporating aqueous extract of red clover along with hyaluronic acid, aloe vera, glycerine, almond oil, emulsifying wax, shea butter, and snail mucin. An aqueous extract of red clover was prepared by adding an amount of red clover powder into methanol and gently heating it. Aloe vera gel and glycerine are added to distilled water and then heated in a water bath until the aloe vera gel is dissolved. Hyaluronic acid was incorporated in the mixture and mixed thoroughly. The oil phase is prepared by heating the mixture of almond oil, shea butter, and emulsifying wax in a petri dish. When the two phases achieve 70 degrees Celsius, mix it as an oil-in-water type method with continuous stirring. After that, the other ingredients, like snail mucin and preservatives like propyl paraben, were added and stirred well until they were evenly distributed. A few drops of rose oil were added to the final mixture, four formulations, F1, F2, F3, and F4, were prepared by varying concentrations of the ingredients and using various ingredients like coconut oil and vitamin E. The formulated lotion preparations were made to undergo a series of evaluation studies such as physical appearance, pH, spreadability, stability, dye test, homogeneity, and irritation test.

The results of the evaluation studies of the formulated body lotion were found satisfactory. The formulation F4 showed all the prerequisites to become an ideal lotion, while formulations F1 shows non-satisfactory consistency. Based on the data obtained from evaluation studies such as physical appearance, stability studies, pH, spreadability, dye test, homogeneity, irritation test, and formulation, F4 was found to be the best among the four preparations, as it showed great consistency and homogeneity.

The transition body lotion is formulated and has successfully resulted in a revitalizing skin care product that is stable and efficacious, easy to apply, and easily absorbed. The formulation process adopted for the study was simple and economical and was carefully executed to ensure the safety and efficacy of the final product.

REFERENCES

1. Ogilvy. Vaseline introduces Transition Body Lotion for transgender women [Internet]. 2024 [cited 2025 Feb 25]. Available from: https://www.ogilvy.com/work/transition-body-lotion
2. Alander J. Shea butter with improved moisturisation properties. AAK. 2009:1-3.
3. Bravo B, Correia P. Benefits of topical hyaluronic acid for skin quality and signs of skin aging. NLM. 2022;35(12).

4. Manzoureh R, Farahpour MR. Topical administration of hydroethanolic extract of red clover accelerates wound healing by apoptosis and reepithelialisation. Biotechnic and Histochemistry. 2020:1-9.

5. Mishra S, Tiwari S, Prakash K, Jaiswal P, Rajpoot H. Pharmaceutical assessment of body lotion: An herbal formulation and its potential benefits. Int J Pharm Pharm Sci. 2023;5(2):32-38.

6. Banerjee D, Kumar MR, Mukopadayay S. Formulation and evaluation of herbal body lotion. Int J Pharm Pharm Sci. 2022;6(S2).

7. Ardad SG, Jagtap KU, Dube SD. Formulation and evaluation of herbal body lotion. IJCRT. 2024;12.

8. Kumar S, Khan D, Verma A, Goshain O, Singh L, Kumar A. Formulation and evaluation of multi-purpose face cream with almond oil and neem. Int J Pharm Pharm Res. 2023;26(4). Available from: www.ijppr.humanjournals.com.

9. Rathi NM, Sirsat SV, Tayade SS, Khot AS, Deshmukh AC. Formulation and standardization of herbal lotion: A review. UNRD. 2022;7.

10. Chandrasekar R. A comprehensive review on herbal cosmetics in the management of skin diseases. Res J Topical Cosmetic Sci. 2020;11. Available from: 10.5958/2321-5844.2020.00007.2.

11. Circosta C. Effect of isoflavones from red clover on skin changes induced by ovariectomy in rats. Pubmed. 2006.

12. Becker LC, Bergfeld WF. Safety assessment of glycerine as used in cosmetics. Int J Toxicol. 2019;38(3).

13. Barel AO, Paye M, Maibach HI. Handbook of cosmetic science and technology. 4th ed. London/New York: CRC Press Taylor & Francis Group; 2014.

14. Reiger MM. Harry's cosmeticology. 8th ed. Boston: Chemical Publishing Co., Inc.; 2000.

15. Mithal BM, Saha RN. A handbook of cosmetics. Delhi: Vallabh Prakashan; 2000.

16. Ruiz MA, Pleguezuelos M, Munaz M, Gallardo V. Moisturizing capacity of Aloe vera gel in skin creams made with silicon-based and olive oil-based latex preparation. J Appl Cosmetol. 2004; 22:25-33.

17. .Shiroja M, Rao BC, Teja G, Khaja M, Sahasraket L, Kumar S. Formulation and evaluation of Aloe vera lotion. Int J Pharm Res Appl. 2014;9(2):2163-7.

18. Akhtar N, Khan MS, Mahmood J, Khan HMS, Iqbal M, Bashir S. Formulation development and moisturizing effects of a topical cream of Aloe vera extract. World Acad Sci Eng Technol. 2011;75.

19. Rajashree S, Rose C. Studies on an anti-aging formulation prepared using Aloe vera blended collagen and chitosan. Int J Pharm Sci Res. 2018;582-588.

20. Sharma PP. Cosmetics: Formulation, manufacturing, and quality control. 5th ed. Lucknow: Publications; 2014. P. 230.

21. Rona C, Vailati F, Berardesca E. The cosmetic treatment of wrinkles. J Cosmet Dermatol. 2004;3(1):26-34.

22. Nguyen JK, Masab N, Jagdeo J. Bioactive ingredients in Korean cosmeceuticals: Trends and research evidence. J Cosmet Dermatol. 2020;1-15.

23. Chinaka N, Chuku LC, George G, Oraezu C. Snail slime: Evaluation of anti-inflammatory, phytochemical, and antioxidant properties. J Complement Altern Med Res. 2021;13(1):8-13.

24. Wargala E, Zaleswska A, Sławkska M, Kot I. Snail mucus as an innovative ingredient used in the cosmetology and medical industry. Aesthet Cosmetol Med. 2023; 12:12-25.

25. Blessy AB, Mol S, Soumya U, Sreelaksh KS, Vishnupriya C, Nihala N. A review on formulation and evaluation of mucin-loaded moisturizer stick. Nehru Coll Pharm. 2023;10(5):1-4.

26. Ali S, et al. The structure of skin and transdermal drug delivery system: A review. Res J Pharm Technol. 2015;8(2):103-108.

27. Patil AS, et al. Review on: Standardization of herbs in a new era of cosmeceuticals: Herbal cosmetics. World J Pharm Res. 2017;6(12):303-320.

28. Bijauliya RK, et al. A comprehensive review on herbal cosmetics. Int J Pharm Sci Res. 2017;8(12):4930-4949.

29. Saleem A, et al. Aloe vera gel effect on skin and pharmacological properties. Scholars Int Physiol Anat. 2022;5(1):1-8.