Formulation and Evaluation of Polyherbal Multipurpose Night Massage Cream using Chamomile Flowers and Green Tea Leaves

Jadhav Divya[1], Jawalkar Sakshi[1], Khandagale Dipali[2]
[1]*B. Pharm, Bhalchandra College of Pharmacy, Pune, Maharashtra, India*
[2]*M. Pharm (Pharmaceutics), Bhalchandra College of Pharmacy, Pune, Maharashtra, India*

***Abstract*- This study is aimed to develop and evaluate a polyherbal multipurpose night massage cream formulated with chamomile flowers and green tea leaves. The formulation was designed to meet the rising demand for natural skincare products by incorporating ingredients known for their antioxidant, anti-stress, anti-aging and moisturizing effects. The cream was prepared using Shatdhaut ghrita, Aloe vera gel, Almond oil, Essential oils such as passion flower oil and lavender oil, along with hydroalcoholic extracts of chamomile and green tea. The formulation was evaluated through organoleptic tests, pH, viscosity, homogeneity, spreadability, washability, antimicrobial and antioxidant activities. Results showed excellent skin compatibility and significant biological efficacy. The findings support the potential of this cream as a safe and effective herbal product for night-time skincare, stress relief and massage-based relaxation therapy and overall skin rejuvenation.**

***Index Terms*- Matricaria chamomilla, Camellia sinensis, Polyherbal cream, Antioxidant, Anti-aging, Night massage, Anti-stress**

I. INTRODUCTION

Cosmetics are preparations intended to be applied to the external parts of the human body, such as the skin, hair, nails, lips and external genital organs, primarily for the purposes of cleansing, beautifying, promoting attractiveness or altering appearance. Creams are among the most widely used cosmetic products due to their versatile application and ability to form a barrier on the skin's surface, to retain moisture and deliver active ingredients. They are semisolid emulsions designed to hydrate, protect and nourish the skin. Night creams are formulated to be applied before bedtime to take advantage of the skin's nocturnal repair cycle. During sleep, the skin undergoes cellular renewal and is more receptive to active compounds. When combined with massage, night creams offer added benefits such as muscle relaxation, improved blood circulation, lymphatic drainage and reduced stress—all of which contribute to a rejuvenated appearance and overall wellness. Herbal night massage creams are a specific category of skincare products that are designed to revitalize the skin, reduce visible signs of aging and promote a calming, spa-like effect. The physical act of massaging the cream into the skin also helps relieve tension, soften fine lines and improve skin elasticity. Thus, such formulations are not only cosmetic but also therapeutic in function.

A] Skin anatomy and functions:

The skin, or integumentary system, is the largest organ of the human body, providing a critical protective interface between the body's internal systems and the external environment. It is a dynamic, multifunctional structure that plays vital roles in protection, thermoregulation, immune defense, sensory perception and metabolic processes such as vitamin D synthesis. Covering an average surface area of 1.5 to 2 square meters in adults and accounting for about 16% of total body weight, the skin is not only vital for survival but also contributes to a person's appearance and identity. Anatomically, it is composed of three primary layers: the epidermis, the dermis and the hypodermis, each of which has distinct yet interdependent structures and functions.

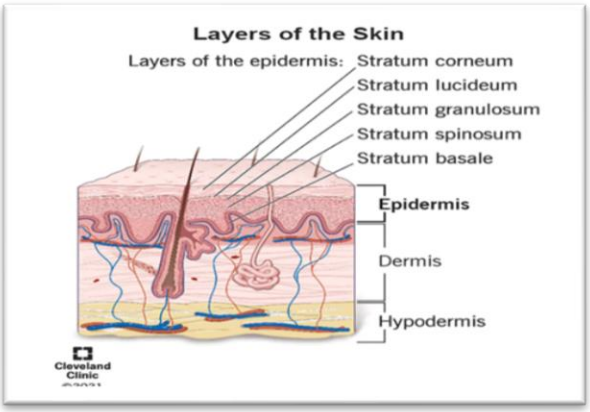

Fig .1. Layers of Skin

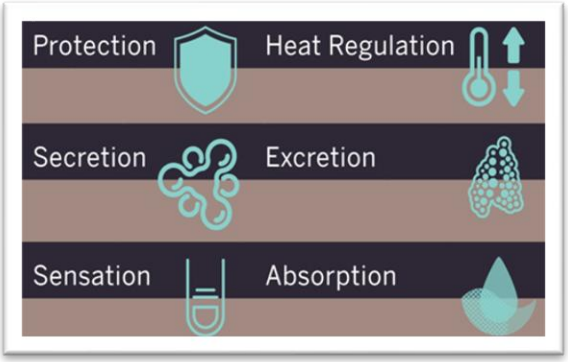

Fig. 2. Functions of skin

1. Epidermis:

The epidermis is the outermost layer of the skin and serves as the body's first line of defense against environmental threats. Composed primarily of keratinocytes arranged in stratified squamous epithelium, the epidermis is a vascular and relies on diffusion from the dermis for nutrient and waste exchange. The thickness of the epidermis varies across different regions of the body, being thinnest on the eyelids and thickest on the palms and soles. Keratinocytes in the basal layer proliferate and differentiate as they move upward through the layers of the epidermis, eventually forming the tough, protective outer layer. At the deepest level of the epidermis lies the stratum basale, a single row of cuboidal or columnar cells that continually divide to produce new keratinocytes. This layer also contains melanocytes, which produce the pigment melanin responsible for skin coloration and protection from ultraviolet radiation, as well as Merkel cells that are involved in touch sensation. As new cells are generated in the stratum basale, they migrate upward into the stratum spinosum, where they begin to synthesize keratin and are connected by strong intercellular junctions called desmosomes. These desmosomal connections give the cells a spiny appearance under the microscope, hence the name "spinosum". Langerhans cells, which function as antigen-presenting immune cells, are also prominent in this layer

Above the stratum spinosum lies the stratum granulosum, where keratinocytes begin to flatten and accumulate keratohyalin granules and lamellar bodies. These structures are essential for the formation of the skin's water barrier and for the process of keratinization. In areas of thick skin, such as the palms and soles, a translucent layer called the stratum lucidum is present above the granulosum.

This layer consists of dead keratinocytes that provides additional protection. The outermost layer of the epidermis is the stratum corneum, composed of flat, dead, enucleated keratinocytes called corneocytes. These cells are embedded in a lipid matrix that creates a formidable barrier against environmental damage and prevents excessive water loss. The stratum corneum is continually shed and replenished through the process of desquamation, ensuring the maintenance of the skin's protective function.

2. Dermis:

Beneath the epidermis lies the dermis, a thick layer of connective tissue that provides structural support, elasticity and resilience to the skin. The dermis is richly vascularized and contains a complex network of blood vessels, lymphatic vessels, nerve endings and skin appendages such as hair follicles, sweat glands, and sebaceous glands. The primary cellular components of the dermis are fibroblasts, which are responsible for synthesizing collagen and elastin fibers that give the skin its strength and flexibility. Other cells, including mast cells, macrophages and lymphocytes, contribute to the skin's immune response.

The dermis can be divided into two regions: the superficial papillary dermis and the deeper reticular dermis. The papillary dermis is composed of loose connective tissue and forms finger-like projections called dermal papillae, which interlock with the epidermal ridges. This structural interlocking increases the surface area for exchange of oxygen, nutrients, and metabolic waste between the dermis and epidermis. The papillary layer contains capillaries, sensory neurons, and specialized touch receptors such as Meissner's corpuscles, which are sensitive to light touch and texture. The deeper reticular dermis consists of dense irregular connective tissue rich in collagen and elastin fibers, providing tensile strength and elasticity to the skin. It houses larger blood vessels, sweat glands, sebaceous glands and the deep portions of hair follicles. The dermis plays a central role in thermoregulation by regulating blood flow and facilitating sweating, as well as in wound healing through the activation of fibroblasts and the formation of new connective tissue.

3. Hypodermis:

The hypodermis, also known as the subcutaneous tissue, lies beneath the dermis and serves as the skin's foundational layer. It is primarily composed of adipose tissue interspersed with loose connective tissue and serves multiple functions, including energy storage, insulation, and cushioning of internal organs. The hypodermis acts as a shock absorber, protecting underlying structures from mechanical injury, and also plays a role in temperature regulation by conserving

body heat. Its thickness varies depending on anatomical location, age, gender, and nutritional status. This layer contains the largest blood vessels and nerves that branch into the dermis and epidermis, ensuring an adequate supply of nutrients and efficient communication with the nervous system.

Blood and Lymphatics Vessels

The lymphatic system, which runs parallel to the blood vascular network, plays a critical role in immune surveillance and fluid homeostasis. Lymphatic capillaries begin in the dermis and drain interstitial fluid, cellular debris and pathogens from the skin into larger lymphatic vessels that connect to regional lymph nodes. These pathways are essential for immune cell trafficking and the initiation of immune responses to pathogens or injury. Dysfunction in this system can lead to lymphedema, delayed wound healing, or chronic inflammation.

B] Functions of Skin-

- Protects against mechanical injury, pathogens and harmful chemicals.
- Shields the body from ultraviolet (UV) radiation.
- Regulates body temperature through sweat and blood flow.
- Detects sensations and supports immune defense through skin-resident immune cells.
- Synthesizes vitamin D in response to sunlight (UVB exposure).
- Excretes waste products through sweat glands and prevents dehydration by reducing water loss.
- Absorbs certain topical substances (e.g., medications, creams).
- Contributes to appearance and social interaction.

C] Herbal Night Massage Cream -

Herbal night massage creams are cosmetic formulations applied at bedtime to support the skin's natural repair mechanisms and deliver therapeutic benefits through both topical action and massage. These creams integrate herbal ingredients known for their antioxidant, anti-aging and moisturizing effects, with the physical stimulation of massage, creating a synergistic solution for skincare and relaxation. At night, the skin becomes more permeable, allowing deeper absorption of bioactive compounds. Massage enhances blood circulation and lymphatic flow, improving nutrient delivery and toxins removal. Herbal actives such as antioxidants help neutralize free radicals, while essential oils provide aromatherapeutic benefits by reducing stress and promoting restful sleep. Herbal night massage creams are used to hydrate dry or aging skin, reduce signs of fatigue and wrinkles, improve skin texture and support stress relief. They may also assist in soothing irritated skin and promoting better skin tone.

D]Herbal night massage creams, when used regularly and properly, can offer a range of benefits for the skin and overall well-being:

- **Deep Moisturization: The blend of herbal oils and natural humectants helps the cream absorb into the skin, restoring lost moisture and preventing dryness.**
- **Improved Skin Elasticity: Ingredients like green tea and chamomile support collagen production, which helps the skin stay firm and more elastic over time.**
- **Reduction of Fine Lines and Wrinkles: Thanks to their high antioxidant content, these creams can help reduce the effects of aging by fighting free radicals.**
- **Soothing and Calming Effect: The presence of essential oils provides a calming sensation, which can ease tension and help the mind unwind.**
- **Enhanced Blood Circulation: The act of massaging the cream into the skin boosts circulation, allowing more oxygen and nutrients to reach skin cells.**
- **Stress Relief and Better Sleep: The gentle massage combined with the calming scent of the cream encourages relaxation, making it easier to sleep peacefully.**

Apart from the benefits, these creams are also known for their thoughtful and skin-friendly formulation:

- **Humectant Effect: Ingredients such as glycerin help draw moisture from the air into the skin, keeping it hydrated for longer.**
- **Occlusive Function: Natural waxes and oils create a light barrier over the skin, reducing water loss and locking in moisture.**
- **Aromatherapeutic Benefit: Essential oils do more than just add fragrance — they also help create a sense of calm and mental ease.**
- **Non-Toxic Composition: Since they're made from herbal and plant-based ingredients, these creams are generally free from harmful chemicals and safe to use long-term.**

E] Key ingredient profiles

1. **Shatdhaut Ghrita -Traditional Ayurvedic formulation**

- Chemical Constituents: Fatty acids, phospholipids, vitamins A, D, E, K
- Applications: Acts as an excellent emollient base for creams, enhances skin hydration, helps deliver active ingredients deep into the skin, and provides a cooling effect ideal for sensitive or inflamed skin.
- Pharmacological Actions: Anti-inflammatory, antioxidant, rejuvenating
- Benefits & Therapeutic Uses: Shatdhaut Ghrita intensely moisturizes the skin, reduces transepidermal water loss, and restores softness and suppleness. It is a traditional Ayurvedic preparation made by washing clarified butter (cow's ghee) 100 times in a copper vessel, producing a rich, cream-like substance. It is widely used for burns, eczema, wounds, and dry skin conditions. In cosmetics, it serves as a soothing, cooling, and nourishing base ideal for sensitive or inflamed skin.

Fig .3. Shatdhaut Ghrita

2. **Chamomile Extract (Matricaria chamomilla)**

- Family: Asteraceae
- Chemical Constituents: Flavonoids (apigenin), terpenoids (bisabolol, chamazulene), coumarins
- Applications: Widely used in creams for its soothing and anti-aging properties. Ideal for formulations targeting sensitive, dry, or inflamed skin.
- Pharmacological Actions: Anti-inflammatory, antioxidant, antimicrobial, mild sedative
- Benefits & Therapeutic Uses:
- Chamomile extract reduces skin redness, calms irritation, combats signs of aging, and enhances skin resilience. Rich in flavonoids and essential oils, it also offers antimicrobial and soothing effects. Commonly used to treat eczema, dermatitis, and sunburns, chamomile promotes relaxation and stress relief in massage creams and night formulations

Fig .4. Chamomile flowers

3. **Green Tea Extract (Camellia sinensis)**

- Family: Theaceae
- Chemical Constituents: Catechins (especially EGCG), polyphenols, tannins, caffeine
- Applications: Used in anti-aging and detoxifying skincare products; protects skin from UV damage and pollution.
- Pharmacological Actions: Antioxidant, antimicrobial, anti-inflammatory
- Benefits & Therapeutic Uses: Green tea extract prevents premature aging, improves skin tone and elasticity, and detoxifies the skin. Rich in EGCG and polyphenols, it combats free radicals and reduces oxidative stress. Effective in treating acne and inflammation, it tightens skin and enhances complexion. Ideal for formulations aimed at pollution defense and rejuvenation.

Fig .5. Green Tea leaves

4. **Aloe Vera Gel (Aloe barbadensis)**

- Family: Liliaceae
- Chemical Constituents: Polysaccharides, anthraquinones, enzymes, vitamins A, C, E
- Applications: Commonly used in hydrating and soothing creams, especially for sun-damaged or irritated skin.
- Pharmacological Actions: Skin regenerating, antimicrobial, anti-inflammatory
- Benefits & Therapeutic Uses:
- Aloe vera deeply hydrates the skin, promotes collagen synthesis, soothes inflammation, and aids in scar healing. It stimulates fibroblast activity for tissue repair and is widely used to treat sunburns, wounds, and cuts. A staple in cosmetic products for

calming irritation and improving post-inflammatory skin recovery.

5. Almond Oil (Prunus amygdalus)

- Family: Rosaceae
- Chemical Constituents: Oleic acid, linoleic acid, vitamin E, phytosterols
- Applications: Used in emollient-rich skincare for dry and aging skin; also acts as a massage oil.
- Pharmacological Actions: Emollient, antioxidant, anti-inflammatory
- Benefits & Therapeutic Uses: Almond oil improves complexion, nourishes and softens skin, and helps reduce dark circles and fine lines. Rich in vitamin E and essential fatty acids, it relieves itching, dryness, and irritation. It promotes an even skin tone, prevents premature wrinkles, and is ideal for use in both cosmetic and therapeutic massage applications.

6. Lavender Oil (Lavandula angustifolia)

- Family: Lamiaceae
- Chemical Constituents: Linalool, linalyl acetate, cineole, camphor
- Applications: Added to creams for fragrance, calming effect, and antimicrobial activity.
- Pharmacological Actions: Sedative, antiseptic, anti-inflammatory
- Benefits & Therapeutic Uses:
- Lavender oil relieves stress, promotes better sleep, and soothes skin sensitivity. It helps treat minor irritations and supports skin healing. Known for its calming aroma, it's frequently used in aromatherapy for anxiety and insomnia, making it a vital ingredient in night-time skincare and massage formulations.

Fig.6. Lavender flowers

7. Passion Flower Oil (Passiflora incarnata)

- Family: Passifloraceae
- Chemical Constituents: Flavonoids, alkaloids, linoleic and oleic acid
- Applications: Incorporated for its relaxing effects and ability to nourish dry or stressed skin.
- Pharmacological Actions: Anxiolytic, anti-inflammatory, antioxidant
- Benefits & Therapeutic Uses: Passion flower oil enhances relaxation, soothes nerves, and improves skin hydration and texture. Rich in skin-nourishing fatty acids and calming compounds, it reduces signs of fatigue and promotes restful sleep. It is used in topical applications for stress relief and to support emotional well-being.

Fig.7. Passion flower

8. Rose Water (Rosa damascena)

- . Family: Rosaceae
- Chemical Constituents: Geraniol, citronellol, flavonoids, phenyl ethanol
- Applications: Acts as a natural toner and coolant in cosmetic formulations.
- Pharmacological Actions: Astringent, antioxidant, anti-inflammatory
- Benefits & Therapeutic Uses:
- Rose water refreshes, hydrates, and tightens pores while improving skin glow. It calms skin redness, reduces puffiness, and balances skin pH. With its soothing aroma and gentle toning effects, it is especially suitable for sensitive skin and is commonly used in night creams for skin rejuvenation and mood enhancement.

II. METHODOLOGY

A] Preparation of Extracts

1] Extraction of Matricaria chamomilla (Chamomile) Flowers

- Chemical Constituents: Apigenin, bisabolol, chamazulene, flavonoids, coumarins
- Solvent Used: Hydroalcoholic (ethanol: water, 70:30)

2] Extraction of Camellia sinensis (Green Tea)

- Chemical Constituents: Catechins (EGCG), caffeine, polyphenols, tannins
- Solvent Used: Hydroalcoholic (ethanol: water, 70:30)

B] Plant Materials:

The herbal extracts used in the formulation were obtained through Soxhlet extraction. Dried chamomile flowers (Matricaria chamomilla) and green tea leaves (Camellia sinensis) were first cleaned and shade-dried, then powdered using a mortar and pestle to a coarse consistency suitable for extraction. Approximately 30 grams of each powdered material was subjected using a Soxhlet apparatus with a hydroalcoholic solvent mixture of ethanol and water in a 70:30 ratio. The extraction process was carried out for 6 to 8 hours at a controlled temperature of around 60°C to ensure optimal yield of bioactive constituents such as flavonoids, polyphenols, coumarins, etc. The collected extract was concentrated on a water bath to remove the solvent, and the semisolid residue was stored in amber-colored glass containers under refrigeration until further use in cream formulation.

Fig. 8. Grinding and sieving

Fig. 9. Soxhlet extraction

C] Preliminary Tests

The extracts of chamomile (Matricaria chamomilla) and green tea (Camellia sinensis) were collected and subjected to preliminary phytochemical analysis to determine the presence of various bioactive constituents like flavonoids, coumarins, tannins, polysaccharides, alkaloids, phenolic compounds, etc.

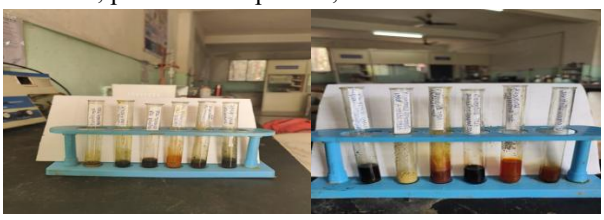

Fig . 10. Preliminary tests

D] Formulation Procedure of Polyherbal Night Massage Cream

SR.NO.	INGREDIENTS	CONTROL	Formulation 1	Formulation 2
1	Shatdhaut Ghrita	5.1 g	5.1 g	5.1 g
2	Beeswax	1.9 g	1.9 g	1.9 g
3	Almond Oil	7.00 mL	7.00 mL	7.00 mL
4	Aloe vera gel	2.0 g	2.0 g	2.0 g
5	Chamomile Extract	-	0.5 mL	0.6 mL
6	Green Tea Extract	-	0.5 mL	0.4 mL
7	Glycerin	0.3 mL	0.3 mL	0.3 mL
8	Borax	0.5 g	0.5 g	0.5 g
9	Passion flower essential oil	-	0.3 mL	0.4 mL
10	Lavender essential oil	-	0.3 mL	0.4 mL
11	Rose water	1.3 mL	1.3 mL	1.1 mL
12	Methyl Paraben	0.04	0.04g	0.04 g
13	Sandalwood fragrance oil	-	0.3 mL	0.3 mL

Table. 1. Formulation table

E] Experimental Work : The polyherbal cream was prepared using the oil-in-water (O/W) emulsion technique following these steps:

1. **Preparation of Shatdhaut Ghrita:**
   Take 100 g of pure cow's ghee in a wide-mouthed copper plate. Add 100 mL of clean water and stir it clockwise. Remove the separated water after stirring. Repeat this process with fresh 100 mL water each time. Continue for 100 washes and final product becomes a soft white, cream.

Fig .11. Soft white cream obtained after 100 rotations

All the ingredients for herbal cream including essential oils were weighed according to the formula.

2. **Preparation of Oil Phase (Phase A):**

Shatdhaut Ghrita, beeswax and almond oil were weighed accurately and transferred into a clean beaker. The contents were heated up to 70°C with constant stirring to form a homogeneous oil phase.

Fig 12. Oil Phase heated at 70 degrees Celsius

3. **Preparation of Aqueous Phase (Phase B)-**

Aloe vera gel, rose water, glycerin, borax, and methyl paraben were weighed and placed in a separate beaker. The mixture was heated to 70°C until
the borax and methyl paraben dissolved completely. After dissolution, the hydroalcoholic extracts of *Matricaria chamomilla* and *Camellia sinensis* were added and stirred thoroughly to form a uniform aqueous phase.

4. Emulsification Process-

The hot aqueous phase (B) was slowly added to the hot oil phase (A) with continuous stirring using a mechanical stirrer. Emulsification was continued for 15–20 minutes to form a stable and uniform cream.

Fig. 13. Emulsification of water phase into the oil phase

5. Cooling and Addition of Essential Oils-

The emulsion was allowed to cool below 40°C. Once cooled, essential oils of lavender and passion flower were added dropwise and gently stirred to evenly distribute them and preserve their aromatic and therapeutic properties.

6. **Filling and Packaging:**

The final cream was filled into clean, dry round, wide-mouth plastic container. The containers were sealed, labeled and stored in a cool and dry places.

III. EVALUATION TESTS AND RESULTS -

1. Physical Examination

Method: The herbal cream was evaluated visually under daylight for color, appearance, odor and physically tested for texture by applying a small quantity on the skin.

Sr. No.	Batch	Colour	Appearance	Odor	Texture / After Feel
1	Control	Light yellow	Smooth	Mild and pleasant	Oily finish
2	F1	Ochre	Smooth	Sweet floral aroma	Soft and slightly oily finish
3	F2	Ochre	Smooth	Sweet floral aroma	Soft and slightly oily finish

Table 2. Physical examination

Fig .14. Physical evaluation

Observation: All batches were visually acceptable, with F1 and F2 offering improved aesthetic and sensory properties.

2. Homogeneity

Method: Visual inspection was performed after creams were set in containers to check for uniform distribution and absence of aggregates. Texture was also verified by pressing between fingers or glass slides.

Sr. No.	Batch	Homogeneity Status
1	Control	Homogenous
2	F1	Homogenous, no phase separation
3	F2	Homogenous, no phase separation

Table 3. Homogeneity test

Observation: All cream batches, including control, F1, and F2, were found to be uniformly homogeneous with no evidence of phase separation, lumps, or aggregation. F1 and F2 exhibited a smoother and more even consistency compared to the control.

4. pH Measurement

Method: 3 g of cream was dispersed in 25 mL distilled water. The electrode (prewashed and dried) of a digital pH meter was inserted. Readings were taken in triplicate and averaged.

Sr. No.	Batch	pH
1	Control	7.00
2	F1	6.21
3	F2	6.65

Table 4. pH measurement

Fig. 15. pH meter reading

Observation: The pH values of all batches ranged from 6.21 to 7.00, indicating suitability for topical application. F1 and F2 formulations had slightly acidic pH values closer to the skin's natural pH, suggesting enhanced skin compatibility and lower irritation potential.

4. Spread ability Test

Method: 1 g of cream was placed between two glass slides. A 20 g weight was applied on the top slide. The time (T) for the upper slide to move a fixed distance (L) was recorded. Spreadability was calculated as:

$$S = M \times L / T$$

Sr. No.	Batch	Spreadability (g·cm/s)
1	Control	21.43
2	F1	18.75
3	F2	20.00

Table 5. Spreadability test

Observation: All cream formulations demonstrated good spreadability. The control had the highest spreadability, while F1 showed slightly lower values due to higher viscosity. F2 provided a balance between ease of application and retention on skin, indicating a cosmetically desirable profile.

5. Viscosity

Method: Brookfield viscometer with spindle no. 6 was used at 10 RPM at 25°C.

RPM	Viscosity (cP)
10	49137

Table 6. Viscosity reading

Observation: The viscosity reading of 49137 cP at 10 RPM confirms the cream's semi-solid consistency. The measured viscosity ensures appropriate texture, ease of handling, and stability during storage, indicating suitability for cosmetic application.

6. Washability

Method: Small quantity of cream was applied on skin and washed off using warm water. Ease of removal and skin feel were observed.

Sr. No.	Batch	Observation
1.	Control	Moderate removability
2.	F1	Moderate , adequate cleansing using lukewarm water
3.	F2	Moderate , adequate cleansing using lukewarm water

Table 7. Washability test results

Observation: All formulations exhibited moderate washability. F1 and F2 could be easily removed using lukewarm water without leaving any greasy residue, while the control required more effort to clean. This suggests F1 and F2 provide better cleansing and user comfort.

7. Irritation / Patch Test

Method: Cream was applied on the forearm and behind the ear. Skin reactions were observed after 24 hours.

Sr. No.	Batch	Behind Ear	On Forearm
1.	Control	No itching or irritation	No redness or irritation
2.	F1	No itching or irritation	No redness or irritation
3.	F2	No itching or irritation	No redness or irritation

Table 8. Patch test

Observation: None of the tested formulations produced any visible signs of irritation, redness, or itching on the forearm or behind the ear after 24 hours. This indicates that all formulations are dermatologically safe for topical use.

8. Antimicrobial Activity

Method: Agar Well Diffusion Method

Nutrient agar was poured into sterile Petri dishes and allowed to solidify. Staphylococcus aureus (Gram +) and E. coli (Gram -) cultures were evenly spread on the surface. Wells (6 mm) were punched and filled with 50 mg/mL and 100 mg/mL cream formulations. Ofloxacin (100 µg/mL) served as the standard antibiotic. Plates were incubated at 37°C for 48 hours. Zones of inhibition were measured using a scale.

Name of Organism	**Zone of Inhibition (mm)**	**Zone of Inhibition (mm)**	**Zone of Inhibition (mm)**
Concentration	50 mg/mL	100 mg/mL	Ofloxacin (100 ug/mL
Control	O mm	O mm	--
S. aureus	14 mm	16 mm	22 mm
E. Coli	12 mm	16 mm	21 mm

Table 9. Antimicrobial test

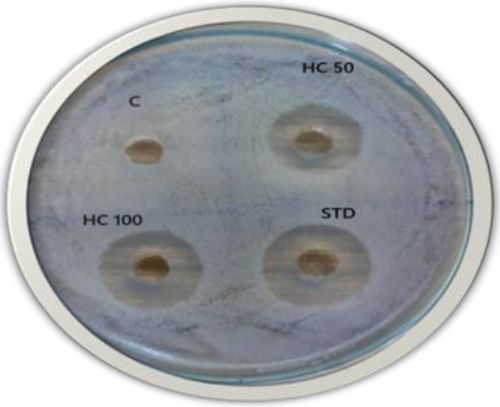

Fig 16. Gram positive S. aureus **Fig. 17. Gram Negative E. coli**

Observation: Herbal cream showed significant antibacterial activity against both S. aureus and E. coli, especially at higher concentrations.

9. **Antioxidant Activity *Method*:** DPPH Radical Scavenging Assay 0.5 mL of 0.1 mM DPPH (in methanol) was added to varying concentrations of cream (50 mg and 100 mg**).** Volume

Concentration (uL)	**OD at 517 nm**	**% Scavenging**
Control	1.455	-
100	0.701	51.82
200	0.451	69.00
300	0.233	83.98
400	0.154	89.41
500	0.103	92.92
Cream 50 mg	0.667	54.15
Cream 100 100 mg	0.539	62.95

Table 10: Antioxidant activity

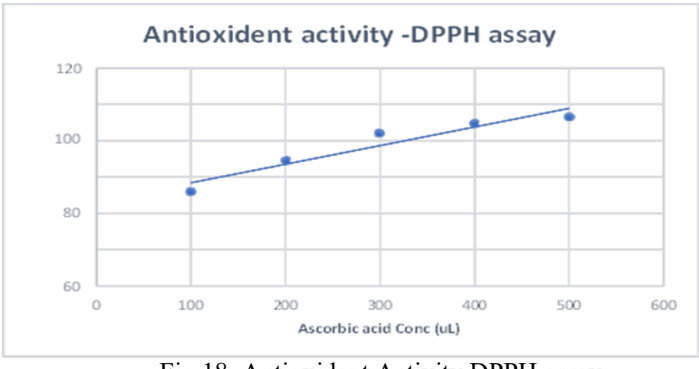

Fig.18. Antioxidant Activity DPPH assay

Observation: The herbal cream demonstrated good antioxidant potential, especially at 100 mg concentration, proving its capability to neutralize free radicals effectively.

IV. CONCLUSION

The herbal night massage cream formulated with chamomile and green tea extracts, enriched with lavender oil and passion flower oil, offers a potent blend of antioxidant, anti-aging, anti-inflammatory, and hydrating benefits. It promotes collagen synthesis,

enhances skin elasticity, repairs damaged skin, and provides a calming effect ideal for nightly skin rejuvenation. This clean, natural formulation supports skin detoxification, reduces acne, and soothes irritation, making it a multifunctional cosmeceutical. It aligns with rising consumer interest in herbal and wellness-based skincare. The cream holds potential for customization, spa and wellness integration, eco-friendly packaging, and global expansion through advanced formulations and regulatory certifications. This polyherbal cream formulation presents potential for commercialization in the cosmeceutical industry, particularly in wellness-based skincare products. Further clinical evaluations can support its market viability.

REFERENCES

[1]. Dai, Y.-L., Li, Y., Wang, Q., Niu, F.-J., & Li, K.-W. (2023). Chamomile: A review of its traditional uses, chemical constituents, pharmacological activities and quality control studies. Molecules, 28(1), 133. https://doi.org/10.3390/molecules28010133

[2]. Mukhammadieva, M. M., & Saidova, M. K. (2022). Pharmacological action of the components of chamomile pharmacy and its use in cosmetics. World Bulletin of Public Health, 17. https://www.wbpublishing.com

[3]. Sah, A., Naseef, P. P., & Kuruniyan, M. S. (2022). A comprehensive study of therapeutic applications of chamomile. Pharmaceuticals, 15(10), 1284. https://doi.org/10.3390/ph15091284

[4]. Srivastava, J. K., Shankar, E., & Gupta, S. (2010). Chamomile: A herbal medicine of the past with bright future. Molecular Medicine Reports, 3(6), 895–901. https://doi.org/10.3892/mmr.2010.377

[5]. Navindgikar, N. N., Kamalapurkar, K. A., & Chavan, P. S. (2020). Formulation and evaluation of multipurpose herbal cream. International Journal of Current Pharmaceutical Research, 12(3), 41–44.

[6]. Singh, O., Khanam, Z., Misra, N., & Srivastava, M. K. (2011). Chamomile (Matricaria chamomilla L.): An overview. *Pharmacognosy Reviews, 5(9), 82–95.

[7]. Liao, R., Parker, T., Bellerose, K., Vollmer, D., & Han, X. (2022). A green tea containing skincare system improves skin health and beauty in adults: An exploratory controlled clinical study. Cosmetics, 9(3), 96. https://doi.org/10.3390/cosmetics9030096

[8]. Koch, W., Zagórska, J., & Marzec, Z. (2019). Applications of tea (Camellia sinensis) and its active constituents in cosmetics. Molecules, 24(23), 4277. https://doi.org/10.3390/molecules24234277

[9]. Arct, J., Bielenda, B., Oborska, A., & Pytkowska, K. (2003). The tea and its cosmetic application. Journal of Applied Cosmetology, 21(3), 143–152.

[10]. Roy, J., Pal, A., & Chakraborty, S. (2024). Herbal creams: An overview. International Journal of Health Sciences and Research, 14(7), 1–8.

[11]. Kapadnis, V., & Mhaske, A. (n.d.). Formulation and evaluation of herbal anti-aging night cream. International Journal of Pharmaceutical Sciences. https://doi.org/10.12345/ijps.v1n1.001

[12]. Miroddi, M., Calapai, G., Navarra, M., Minciullo, P. L., & Gangemi, S. (2013). Passiflora incarnata L.: Ethnopharmacology, clinical application, safety and evaluation of clinical trials. *Journal of Ethnopharmacology, 150(3), 791–804. https://doi.org/10.1016/j.jep.2013.09.045

[13]. Sabara, D., & Kunicka-Styczyńska, A. (2009). Lavender oil – Flavouring or active cosmetic ingredient? ResearchGate. https://www.researchgate.net/publication/266446287

[14]. Deshmukh, M. D., Patil, M. P., Ahire, E. D., & Gosavi, S. B. (2022). Shatdhauta Ghrita: A promising agent in the development of herbal creams. Journal of Pharmaceutical Negative Results, 13(Special Issue 1), 123–129.

[15]. Chavan, M., Bachhav, R., Bhamare, M., & Sharma, Y. (2025). Detailed review of Shatdhaut Ghrita as a base in moisturizing cream. Research Journal of Pharmaceutical Dosage Forms and Technology, 17(1), 85–91.

[16]. Solórzano, M. V. P., Costa, G. M., & Castellanos, L. (2024). Passiflora by-products: Chemical profile and potential use as cosmetic ingredients. Scientia Pharmaceutica, 92(1), 57. https://doi.org/10.3390/scipharm92010057

[17]. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2024). Pharmacognosy (58th ed.). Nirali Prakashan.

[18]. Nema, R. K., Rathore, K. S., & Dube, B. K. (n.d.). *Textbook of cosmetics*. CBS Publishers and Distributors.
[19]. Blaak, J., & Staib, P. (2022). An updated review on efficacy and benefits of sweet almond, evening primrose and jojoba oils in skin care applications. *International Journal of Cosmetic Science, 44*(1), 1–9. https://doi.org/10.1111/ics.12745
[20]. Rajeswari, R., & Umadevi, M. (n.d.). Aloe vera: The miracle plant – Its medicinal and traditional uses in India. Journal of Pharmacognosy and Phytochemistry. ISSN: 2278-4136.
[21]. Pareek, S., & Nagaraj, A. (2013). Aloe vera: A herb with medicinal properties. International Journal of Oral Care and Research, 1(1), 15–18.
[22]. Hobbs, H. (n.d.). Benefits of rose water and how to use it. *Healthline*. [https://www.healthline.com/health/rose-water-benefits(https://www.healthline.com/health/rose-water-benefits)
[23]. Abidi, S., & Zaidi, A. (2019). Assessment of rose water and evaluation of antioxidant and anti-inflammatory properties of a rose water based cream formulation. International Journal of Pharmaceutical and Clinical Research, 11(1), 43–48.
[24]. Lachman, L., Lieberman, H. A., & Kanig, J. L. (2009). The theory and practice of industrial pharmacy (4th ed.). Lea & Febiger.
[25]. Soorya, P. S., & Boban, A. (2023). Evaluation of antioxidant and anti-inflammatory activity of formulated herbal cream. International Journal of Pharmaceutical Research and Application, 8(5), 404–411. https://doi.org/10.35629/7781-0805404411