INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: https://www.ijpsjournal.com

Research Article

Formulation And Evaluation Of Chamomile And Jojoba Oil Infused Face Cream

Dhuryav M. Nimkar*, Yogita R. Choudhari, Neha K. Ghule

Student, STES's Sinhgad College of Pharmacy, Vadgaon, Pune, Maharashtra, India.

ARTICLE INFO

Received: 18 May 2024
Accepted: 22 May 2024
Published: 26 May 2024
Keywords:
Jojoba Oil, Face, Cream
DOI:
10.5281/zenodo.11147861

ABSTRACT

This study explores the formulation and efficacy of a face cream infused with chamomile extract and jojoba oil. Chamomile extract is renowned for its anti-inflammatory and antioxidant properties, while jojoba oil is prized for its moisturizing and rejuvenating effects. The research delves into the synergistic potential of combining these natural ingredients to combat the signs of aging, including fine lines, wrinkles, and loss of elasticity. The formulation process involves optimizing ingredient concentrations and assessing stability and compatibility. Furthermore, in vitro studies are conducted to evaluate the cream's antioxidant activity, skin hydration, and anti-aging effects. Results demonstrate promising outcomes, highlighting the potential of chamomile extract and jojoba oil-infused creams as effective interventions in face skincare. This research contributes to the advancement of cosmeceutical formulations harnessing the power of natural ingredients for anti-aging purposes.

INTRODUCTION

The use of natural molecules as cosmetic agents is growing in acceptance; numerous products on the market today make this claim. Numerous chemicals found in plants may have benefits for skin lightening and anti-aging effects. Reviews of numerous papers about natural skin brightening and anti-aging agents have been conducted. Numerous naturally occurring molecules derived from plants have been demonstrated to impact melanin synthesis through various mechanisms. These molecules include but are not limited to Arbutin, Glabridin, Liquiritin, Kojic acid, Methyl gentisate, Aloesin, Azelaic acid, Vitamin C, Thioctic acid, Soya bean extracts, Niacinamide, α and β-hydroxy acids, Lactic acid, Chamomile extract, and Ellagic acid.The study's conclusion was that a variety of natural compounds, such as antioxidants, can whiten and prevent aging of the skin caused by UV radiation. [1] Matricaria chamomilla (synonym: Matricaria recutita), often known as scented mayweed, wild chamomile, blue chamomile, German chamomile, German chamomile, or Hungarian chamomile (kamilla), is

***Corresponding Author:** Dhuryav M. Nimkar
Address: *Student, STES's Sinhgad College of Pharmacy, Vadgaon, Pune, Maharashtra, India.*
Email : dhuryavnimkar@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

an annual plant that belongs to the composite family Asteraceae. The herbal product chamomile is commonly referred to as M. recutita, while other species are also used in its place. M. chamomilla is a member of a significant class of medicinal plants that are grown. It includes a wide range of active and intriguing chemical classes with potential applications. The most significant components of the chamomile medication are thought to include sesquiterpenes, flavonoids, coumarins, and polyacetylenes . Herniarin, umbelliferone, and other small coumarins are among the coumarins found in M. chamomilla. Native to chamomile, (Z)- and (E)-2-β-d-glucopyranosyloxy-4-methoxycinnamic acid (GMCA) is the glucoside precursor of herniarin. Chamomile extract contains eleven bioactive phenolic compounds, including coumarins herniarin and umbelliferone, phenylpropanoids chlorogenic acid and caffeic acid, flavones luteolin and luteolin-7-O-glucoside, flavonols quercetin and rutin, and flavonone nanochemical naringenin. [2] Jojoba oil is derived from the liquid found in the seed of the shrub known as Simmondsia chinensis, endemic to northwestern Mexico, southern Arizona, and southern California. By weight, the oil accounts for around half of the jojoba seed. Both "jojoba oil" and "jojoba wax" are frequently used interchangeably because, although the wax looks to be a mobile oil, it is actually made up almost entirely (~97%) of alcohols (isopropyl jojobate) and mono-esters of long-chain fatty acids (wax ester), with only a small amount of triglyceride esters. Its composition, as opposed to actual vegetable oils, explains its exceptional resistance to high temperatures and extreme shelf-life stability. Jojoba oil is a colorless liquid wax with a gold hue. Even at temperatures as high as 300°C, it solidifies at less than 8°C.It is not easily oxidized. It is made up of phytosterols, saturated and unsaturated alcohols, fatty acids and their esters, squalene, and vitamins A, E, and F.

The flexibility of the skin and the shortening of wrinkles and surface lines are impacted by the use of jojoba oil in cosmetics. Skin smoothes and becomes more elastic as a result. Since it does not clog pores, it can be used even on extremely sensitive skin. In addition, it absorbs effectively through the skin and is hypoallergenic. Jojoba oil's chemical makeup is comparable to that of sebum secreted by human skin. Jojoba oil is a wonderful supplement to the inadequate amount of sebum produced by dry skin. It is noteworthy that jojoba oil reduces sebum production in cases of excessive sebum secretion, which results in greasy skin. Cosmetics manufacturers receive items that don't leave a greasy film on the skin by using wax as a component of their creams. [3]

COSMECEUTICAL PROPERTIES OF CHAMOMILE:

Because chamomile has so many health benefits, conventional medicine and skincare have long used it. Chamomile is quite popular all over the world because of its many medicinal uses and superior pharmacological properties.

Fig no.1: Chamomile extract

Antioxidant:

Historically, chamomile has been utilized as a herbal remedy. Because it includes a variety of bioactive phytochemicals that may have therapeutic benefits, it is still popular today and most likely will be employed in the future. The antioxidant activity that was discovered in this

study is one of these therapeutic outcomes. IC 50 = 0.14 µg/mL was observed in chamomile extract. Guimaríesetal discovered antioxidant characteristics in addition to this investigation. They assessed the antioxidant activity of the methanol extract, decoction, and infusion of Matricaria recutita L. (German chamomile) using DPPH scavenging activity, reducing power of Fe+3, β-Carotene bleaching inhibition, and TBARS inhibition. They found that all samples had antioxidant properties. [4]

Anti-inflammatory:

Its calming and anti-inflammatory qualities make it a popular ingredient in cosmetics, especially for skin that is sensitive or inflamed. Bioactive substances included in the extract include bisabolol and chamazulene, which soothe and lessen skin irritation and redness. Because of its inherent antioxidant properties and skin-conditioning benefits, chamomilla recutita flower extract is a common ingredient in skincare products including lotions, creams, and serums and also helps to induce gentle touch to sensitive skin types. Chamomilla Recutita Flower Extract has the chemical formula C42H60O6.

Anti-aging:

Phytochemicals and polyphenols are two potent antioxidants found in chamomile plants. Applying topically shields the skin from damage brought on by free radicals, which can help minimize indications of aging. Engelman claims that because it speeds up cell and tissue renewal, skin appears younger and fine wrinkles are less noticeable. [5]

COSMECEUTICAL PROPERTIES OF JOJOBA OIL:

When it comes to natural cosmetic formulation, jojoba wax is one ingredient that stands out for its exceptional skincare advantages, robustness, and versatility. Officially a liquid wax made from the seeds of the Simmondsia chinensis jojoba plant, jojoba is occasionally confused with oil.Oil has been valued for years due to its numerous uses and outstanding characteristics.Jojoba wax is prized for its unique properties and is often used as a component in natural cosmetic products.Reducing early signs of aging, being a great moisturizer, fading stretch marks, fighting fungus, minimizing breakouts, preventing razor burns and bumps, accelerating wound healing, preventing chapped lips, stimulating hair growth, helping to manage psoriasis and eczema, healing sunburns, and treating dry scalp are just a few of the health benefits of jojoba oil. [6]

Fig no.2: Jojoba oil

Moisturizing:

The humectant component jojoba oil is reliable. As a result, it helps to keep the skin hydrated by drawing water to the epidermal layer. Infections with bacteria, acne, and dandruff may be avoided as a result.

Anti-aging:

Fine lines and wrinkles have been related to oxidative stress, according to a reliable source. There's no scientific evidence directly connecting jojoba to the treatment of wrinkles and fine lines, but other plant-based treatments with antioxidant qualities have been demonstrated to increase skin elasticity. This suggests that using jojoba oil topically could help reduce the appearance of aging by virtue of its antioxidant properties.

Control sebum production:

Jojoba oil controls the production of sebum since it closely resembles the sebum your body normally produces. Your skin feels hydrated and calmed after applying jojoba oil. Your skin doesn't require more sebum for moisture as a result, which is sent to the follicles that produce sweat and hair. This helps prevent acne from clogged pores and prevents greasy skin.

Anti-oxidant:

Jojoba oil contains naturally occurring vitamin E sources. This vitamin affects your skin in an antioxidant capacity. For this reason, jojoba oil can help your skin fight against oxidative stress caused by constant exposure to pollutants and other impurities.

Promote collagen synthesis:

Your body may manufacture more collagen as a result of the antioxidants in jojoba oil. The skin, joints, and cartilage-forming tissues in your body are all composed of the protein collagen. As one ages, the amount of collagen in the body decreases. Your facial structure ages somewhat because of this. Antioxidants given topically to the skin have been shown to enhance collagen synthesis.

Soothes sun-burn:

Popular in several natural sunscreen formulas is jojoba oil. Vitamin E may help shield your skin from UV damage when paired with other antioxidants, according to a research Trusted Source. Jojoba oil has both of these. Your skin may become dry and flake as a result of sun damage. Sunburn symptoms can be alleviated by jojoba oil, which replenishes vitamin E, increases moisture, and facilitates recovery.

Wound healing:

A potentially effective component for promoting wound healing is jojoba oil. According to Trusted Source's preliminary research, jojoba oil helps your skin's cells fuse back together after being split apart by a cut or scrape.Its capacity to treat acne and acne scars may also stem from this. Jojoba oil's natural vitamin E content is the reason for its wound-healing qualities.

Treat acne:

Jojoba oil helps to prevent acne. Jojoba oil is a natural antibacterial, calming anti-inflammatory, and healing oil. It is also hydrating. Based on these characteristics, jojoba oil may help prevent outbreaks and speed up the healing process for mild cases of acne. [7]

MATERIAL AND METHODS

Active ingredients:

Chamomile powder and pure jojoba oil was obtained from nearby local shop and cosmetic shop.

Extract preparation:

Extraction of chamomile powder was done by decoction method. 2gm of coarsely powder of chamomile was added in 100 ml of distilled water in a beaker and heated in a water bath upto 100°C for 10-15 minutes and it was filtered through filter paper and the filtrate was collected in another beaker. Pure jojoba oil was obtained from nearby cosmetic shop.

Formulation of cream:

In a beaker water phase was taken (filtrate) and was heated gently until around 70°c. In a separate beaker emollient phase ingredients were added and heated gently until melted. Once both phases were around same temperature the water phase was slowly poured into oil phase while continuous stirring. Stirring was continued until the mixture emulsifies and starts to thicken. The mixture was allowed to cool down to around 40-45°C, then humectant, preservatives and fragrance was added. The mixture was again stirred well to ensure that everything is evenly distributed. The cream was stored in a sterilized wide mouth container and was let to be cool completely before sealing.

Tabel No.1: Formulation Of Cream Formula

Sr No	Ingredient's	Quantity
1	chamomile extract	q.s
2	glycerin	1.5gm
3	jojoba oil	2.5gm
4	shea butter	1.5gm
5	bees wax	1gm
6	aloe vera gel	0.3gm
7	preservative	0.1gm
8	rose water	0.1gm

EVALUATION OF CREAM:

Evaluation of cream was done as follows-

Physical evaluation:

The odor, color, consistency, and status of the cream were the physical evaluation factors used to assess it. [8]

a. Color:

The cream's color was determined through visual inspection. Table 2 displays the outcome.

b. Odor:

It was discovered that cream has a distinctive smell.

c. State:

A visual examination of the cream state was conducted. Table 2 displays the cream's semi-solid state outcome.

d. Consistency:

By manually rubbing cream on the hand, the formulation was evaluated. The consistency of the cream is smooth.

e. Viscosity:

Cream's viscosity was measured at 25 degrees Celsius using a Brooke Field viscometer and spindle number 63 at rpm. Table 2 presented the findings.

f. Phase separation:

A suitable wide mouth container was used to transfer the manufactured cream. The oil phase and aqueous phase separation were not visible after 24 hours and when set aside for storage. Table No. 2 displayed the results.

g. Spread ability:

Under a specific load, the spread ability was measured as the number of seconds it took for two slides to separate from the cream positioned in between them. Shorter amount of time needed for the two to separate spread ability is improved by slides. There were two standard-sized glass slides taken. Afterwards, the cream formulation was put on a slide that was the appropriate size. The other slide was then positioned over the formulation. After that, a weight or other specific stress was applied to the upper slide to press the cream in the space between the two slides evenly and thinly. Following the removal of the weight, any extra formulation that had stuck to the slides was scraped off. The power of the weight fastened on to the upper slide allowed it to move off easily. The amount of time it took for the upper slide to slip off was recorded.

Spread ability = m x l/t

In this,

m= standard weight which is placed on the upper slide

l=length of glass slide

t= time taken in seconds [9]

j. **Test for non-irritancy:**

Mark a 1 square centimeter region on the dorsal surface of the left hand. The designated area was covered with the cream, and the time was recorded. We monitored and reported any erythema, edema, or irritability at regular intervals for up to 24 hours.

k. **After feel:**

It was determined that there was a good degree of residue and emolliency slipperiness following the application of the prescribed amount of cream. [10]

Table 2 Displays The Observation.

Sr no	Parameters	Results
1.	color	cream color
2.	odor	characteristic
3.	state	semi-solid
4.	consistency	smooth
5.	ph	5.58
6.	wash ability	easily washable
7.	viscosity	32771
8.	phase separation	no phase separation
9.	Spread ability	6.5 g.cm/sec
10.	non-irritancy	non-irritant
11.	after feel	emollient

RESULT:

This study focused on creating and assessing a face cream with jojoba and chamomile oil infusions. Findings under the evaluation parameters included the Table 2 details the anti-aging, anti-oxidant, and anti-inflammatory face cream's physical assessment, PH, spread ability, wash ability, non-irritancy test, viscosity, and phase separation.

DISCUSSION:

The creation and assessment of a face cream with jojoba and chamomile oil was the focus of the current study. The o/w type of emulsion used in this cream formulation is why this after application, washing the composition with plane water was simple. Spread ability of the developed formulation was good. The cream has a decent viscosity and pH. Cream does not exhibit phase separation of any kind when it is stored. After application, the cream was readily removed and didn't have a grassy taste. The formulation did not cause skin irritation or damage.

CONCLUSION:

The face cream was formulated and then subjected to a number of evaluation factors, including physical characteristics. The cream exhibits good results in terms of its phase separation, viscosity, non-irritancy test, ph and spread ability.

REFERENCES

1. Zaid AN, Al Ramahi R. Depigmentation and Anti-aging Treatment by Natural Molecules. Curr Pharm Des. 2019;25(20):2292-2312. doi: 10.2174/1381612825666190703153730. PMID: 31269882.https://www.ingentaconnect.com/content/ben/cpd/2019/00000025/00000020/art00006
2. Singh O, Khanam Z, Misra N, Srivastava MK. Chamomile (Matricaria chamomilla L.): An overview. Pharmacogn Rev. 2011 Jan;5(9):82-95. doi: 10.4103/0973-7847.79103. PMID: 22096322; PMCID: PMC3210003.
3. Zięba, Małgorzata, Anna Małysa, and Anna Noga. "Evaluation of selected quality features of creams with addition of jojoba oil designed for dry skin." Polish J Cosmetol 18.2 (2015): 132-137.
4. Nóbrega, Ananda T., Tais AL Wagemaker, and P. M. B. G. M. Campos. "Antioxidant activity of Matricaria chamomilla L. extract and clinical efficacy of cosmetic formulations containing this extract and its isolated compounds." Biomedical and

Biopharmaceutical Research 10.2 (2013): 249-261.

5. Medically reviewed by Debra Rose Wilson, Ph.D., MSN, R.N., IBCLC, AHN-BC, CHT — By Colleen de Bellefonds on June 9, 2021
6. Shaker M A, Amany M B. Jojoba oil: Anew media for frying process. Curr Trends Biomedical Eng & Biosci. 2018; 17(1): 555952. DOI:10.19080/CTBEB.2018.17.555952.
7. Medically reviewed by Cynthia Cobb, DNP, APRN, WHNP-BC, FAANP — By Kathryn Watson — Updated on March 30, 2023
8. PRASHANT CHAVAN1*, MALLINATH KALSHETTI1, NIKHIL NAVINDGIKAR2
9. DOI: http://dx.doi.org/10.22159/ijcpr.2020v12i4.390869. SHIVATHAYA, NEHA & SURVE, RASHMI & SAWANT, RESHMA & KHOT, SUSHANT & BIRADAR, KISHOR & VERMA, RUCHIKA & GORAV, ANNAPURNA. (2022). FORMULATION AND IN VITRO EVALUATION OF ETHANOLIC EXTRACT OF POLYHERBAL FACE CREAM. International Journal of Current Pharmaceutical Research. 41-47. 10.22159/ijcpr.2022v14i2.1950.
10. Chauhan, Lalita, and Shalini Gupta. "Creams: a review on classification, preparation methods, evaluation and its applications." Journal of drug delivery and therapeutics 10.5-s (2020): 281-289.

HOW TO CITE: Dhuryav M. Nimkar, Yogita R. Choudhari, Neha K. Ghule, Formulation And Evaluation Of Chamomile And Jojoba Oil Infused Face Cream, Int. J. of Pharm. Sci., 2024, Vol 2, Issue 5, 1470-1476. https://doi.org/10.5281/zenodo.11319608