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Extraction of Magnolia Champa Flowers Using Soxhlet and its Application in Red Lentil Face Pack

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ABSTRACT

Synthetically derived products cause a large number of allergies, irritations, cancer prone conditions, etc. Due to this there is an increasing trend and demand of natural product, thus a major focus has been shifted for the formulation of natural face pack. The face pack should be having minimum synthetic chemicals and maximum natural products. Also, it should be characterized with high effectiveness and lesser side effects. As the skin of face is sensitive as compared to the other dermal layers of body, thus the product should be gentle and not harsh. A natural product using aloe vera gel, badam oil, natural flower extract, red lentil powder, vitamin e capsule has been prepared. Various test has been performed thus measuring the suitability of the formulated product.

Keywords: Sonn chafa flower extract , red lentil powder face pack, soxhlet extraction.

Introduction

1) Son Chafa (*Magnolia champaca*)

Michelia champaca exhibits numerous pharmacological activities, including antimicrobial, antipyretic, anti-inflammatory, antioxidant, insecticidal, ant uretic, carminative, antidiabetic properties, among others.[1]

Figure 1 – Flowers of *MAGNOLIA CHAMPACA*

2) Red Lentil Powder

When used in facepacks, the high phenolic content of red lentil extracts can provide significant skin benefits. These extracts can enhance antioxidant protection, combat free radicals, and improve skin health and appearance. The active compounds in red lentil facepacks help in reducing signs of aging, promoting

an even skin tone, and providing a natural glow. Red lentil facepacks offer an effective, natural solution for maintaining healthy, radiant skin.[2]

Figure 2 – Red Lentil Legume

3) Face pack

The herbal paste applied to the face to treat acne, pimples, scars, marks, and pigments is known as "mukha lepa" in Ayurveda. Natural face packs contain essential vitamins required for the health and glow of our skin. These substances prove beneficial for our skin in various ways. Natural facial packs are less complicated and relatively simple to use.[3]

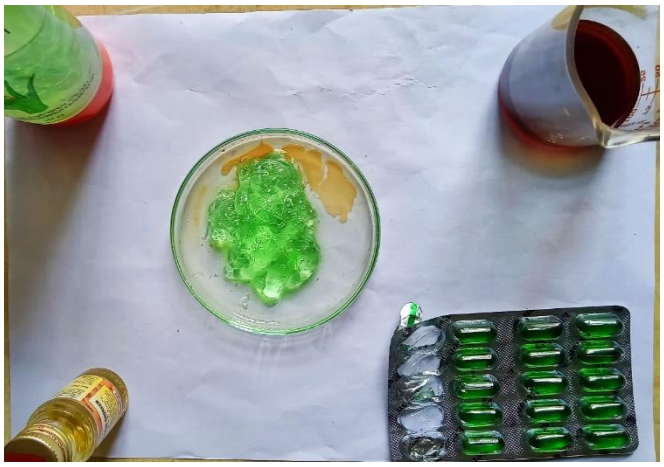


Figure 3 – Materials used for face pack

MATERIALS USED AND THEIR CHARACTERISTICS

SR. NO.	MATERIALS
1.	Aloe vera gel
2.	Almond oil
3.	Vitamin E capsule
4.	Flower extract

1) Aloe Vera Gel

The gel's carbohydrates are made up of three components: 16.2% of the liquid contains mannan, 0.7% consists of microparticles rich in galactose-containing polysaccharides, and 83.1% comprises cell walls with galacturonic acid. Aloe vera boasts a range of benefits, including antibiotic, antiseptic, antibacterial, antiviral, antifungal, anti-infection, anti-inflammatory, and anti-swelling properties. [4]

Figure 4 – Aloe vera gel

2) Almond Oil

Almond oil, also known as Badam oil, is highly versatile and offers numerous beauty benefits -Moisturizes Skin, Reduces Dark Circles, Improves Complexion, Strengthens Hair, Soothes Dry Scalp [5]

Figure 5 – Almond Oil

3) Vitamin E Capsule

Studies on non-enzymatic stratum corneum antioxidants reveal that vitamin E is the principal physiological barrier antioxidant in human skin. Numerous studies have shown that applying vitamin E before ultraviolet exposure significantly reduces acute skin responses like erythema and edema, sunburn cell formation, lipid peroxidation, and DNA-adduct formation. [6]

Figure 6 – Vitamin E Oil Capsules

EXTRACTION OF SONA CHAFA FLOWERS USING SOXHLET

1) Purification of Ethanol Through Distillation

The solvent selected was ethanol of AR grade due to its easy availability, inexpensiveness, and was suitable for solvent extraction. The ethanol available was of 99% purity, however it was still needed to distil out the solvent for more purity and removal of any aqueous content in it. Thus, the ethanol was distilled at 65 C using water distillation method. About 500 ml of ethanol was distilled by batch distillation method.

Figure 7 – Setup For Ethanol Distillation

2) Extraction Process

The distillate solvent of ethanol was used for further extraction of the *magnolia champa*. Initially the collection of flowers was done by local flower market and was washed under flowing tap water to remove the dust and was air dried in shade. Its petal was separated from the stalk and each petal were split into smaller parts. About 115 gm of petals were collected into a round bottom flask and about 400 ml of distilled ethanol was poured into the round bottom flask. The petals were soaked in ethanol overnight for a period of 18 hours. Ethanolic extraction was carried out thereafter at the temperature of 65 C. The heating was continued until the last drop of extract was obtained. The flowers were then collected in a muslin cloth to squeeze the remaining extract of the petals. This extract was then stored in an air tight glass container for further use in formulation of face pack.

Figure 8 – Petals Of Son Chafa Flowers

Figure 9 – Petals of Son Chafa Immersed in Ethanol Overnight

Figure 10 – Flower Extract

METHOD OF PREPARATION OF FACE PACK

SR. NO.	MATERIALS	Scientific name	Weight	Percentage
1.	Aloe vera gel	*Aloe barbadniss*	21.0 gm	84%
2.	Almond oil	*Piunis dulcius*	1.6 gm	6.4%
3.	Vitamin E capsule	---	1.4 gm	5.6%
4.	Flower extract	*Magnolia champa*	1.0 gm	4.0%
5.	Total	----	25 gm	100%

1) The red lentil powder was taken and washed 3-4 times under flowing tap water so as to remove the pesticides and any other impurity. It was then dried completely under shade and was powdered using a mixture grinder. The powder was then filtered using a sieve of 40 mess size and was stored in an air tight container.

2) Formation of cream_base –

The formulation of face pack included aloe vera gel, vitamin E capsule, Rogan badam oil and sonn chafa flower extract. The weight of face pack composed was of 25 grams. Herein the aloe vera gel was under the brand name of Patanjali. The 5.6% of vitamin E content was taken by pouring content of 5 capsules of a brand known Evion USP 400mg. The almond oil used was of Raughan -E badam Shiren brand. The main factor used for fragrances was the flower extract, obtain by sonn chafa ethanolic extract using soxhlet apparatus for about 2.5 hrs. These contents are weighted and transferred into a clean, dry glass plate and mixed unanimously. After proper mixing the colour change is observed from white to greenish with smooth consistency. It is stored in an air tight container. The gel produced can be used for 60 days.

3) The above formulated face pack can be used directly, however the use of this face pack with and without red lentil powder were studied in this paper. Various skin type included oily, acne, dry skin was used for the analysis of the working of the combination of powder and the face pack on one side of the cheeks and only face pack on the either side. The comparative review of the same person having same skin type was obtained for both the parts of study. Further chemical and physical studies were performed so as to know the quality of product and its further analysis.

4) While using the face pack gel along with lentil powder, the 1:2 ratio should be followed. The gel has to be taken in double or twice the quantity of the powder. This helps in easy spread ability thus easing its application on the face.

Figure 11– Different Materials of Face Pack

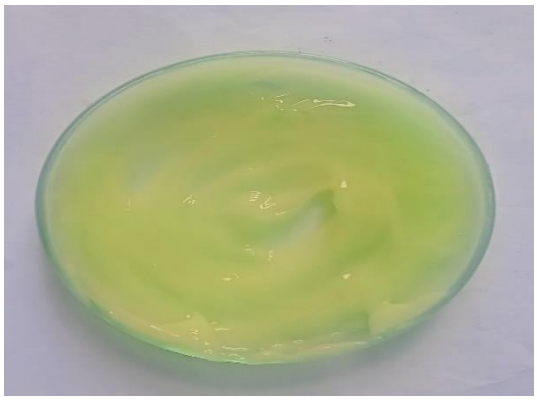


Figure 12 – Formulated Face Pack

EVALUTION TEST FOR FACE PACK

1) Morphological Evaluation

The assessment of the herbal face pack involves examining its colour, odour, appearance, and texture. The physical characteristics of the formulation were evaluated following the procedures outlined by Siddiqui and colleagues.[8]

Sr. No.	Parameter	Face pack	Face pack + powder
1	Colour	Greenish	Greenish orange
2	Odour	Pleasant	Pleasant
3	Appearance	Smooth	Grainy
4	Texture	Fine	Uneven
5	Smoothness	Good	Rough

2) Physio – Chemical test

The face pack and its combination with red lentil powder was observed for physico chemical test including pH, water and alcohol solubility, etc. The average face pH value of male or female 4.6 to 6.4 and 5.2 to 6.2 respectively[9]. Thus, the pH of the product formulated should be near neutrality. Herein 1gm of gel was dissolved in 10 ml of distilled water and 1 gm in 10 ml of ethanol. The same was performed for the combination. This similar combination was used for pH testing after filtration using ordinary filter paper to remove undissolved particles. The obtained result is shown below –

Sr. No.	Parameter	Face pack	Face pack + powder
1	pH	6.45	6.15
2	Water Soluble	Soluble	Undissolved
3	Alcohol Soluble	Soluble	Partially soluble

3) Irritancy Test

The prepared face pack and its combination was subjected to irritancy test and the results. The test parameters included test for irritation, redness and swelling.[10]

Sr. No.	Parameter	Face pack	Face pack + powder
1	Irritation	No	No
2	Redness	No	No
3	Swelling	No	No

4) Drying Time

A layer of face pack consisting the above-mentioned proportion i.e. 1:2 ratio of gel and powder respectively. Ones applied, the face pack was left to air drying without being disturbed and the drying time was noted. The complete drying depends variably on the amount of the face pack applied. The monolayer was observed to be dried within 10-15 minutes completely on all skin types. The drying time is reduced with increasing the amount of lentil powder as it absorbs the moisture thus reducing the drying time.[8]

5) Washability

Formulation was applied on skin and allowed to dry naturally. Once dried, it is washed off using normal tap water without any use of scrub or soaps, etc.[10]

Sr. No.	Parameter	Face pack	Face pack + powder
1.	Washability	Easy to wash	Easy to wash

6) Bulk Density

The bulk density is defined as the ration of mass of the sample upon its volume. To calculate the bulk density the 1 gm of gel was taken and poured into the 10ml measuring cylinder. The volume occupied by the gel into 10ml of borosilicate measuring cylinder was noted and bulk density was calculated. The same procedure was repeated for 1 gm of powder and gel combination.[8]

Bulk Density = Weight of sample / Volume occupied

Sr. No.	Parameter	Face pack	Face pack + powder
1.	Weight	1 gm	1 gm
2.	Volume occupied	1 ml	1 ml
3.	Bulk density	1 (g/ml)	1 (g/ml)

7) Tapped Density

The above measured used for bulk density analysis is further studies to calculated the tapped density of the cream and combination. Herein the cylinder is tapped gently for settling down the particles thus incurring change in the volume. It is to be noted that the amount of sample is same as used in the case of bulk density analysis facilitating easy comparison.[8]

Sr. No.	Parameter	Face pack	Face pack + powder
1.	Weight	1 gm	1 gm
2.	Tapping Volume occupied	1 ml	1.2 ml
3.	Tapped density	1 (g/ml)	0.833 (g/ml)

The density thus observed without tapping the particles was 1000 (g/l) for both the face pack and the combination of powder with face pack. When measuring the tapped density, it is noted to be same for the face pack gel. However, the tapped density increases in case of combination. This occurs due to the addition of granular particles of lentil powder which impart air gaps, thus change the volume. This change in volume is the cause of changing tapping density for the combination of gel and powder.

8) Viscosity Test

While measuring the viscosity the gel was found to very viscous, hence 1 gm of gel was dissolved in 10 ml of distilled water to calculate the viscosity. The combination of gel and red lentil powder is not viscous andvery thick in nature thus viscosity test on it can not be permformed due limitations of oswalds viscometer.

No of sample	**Time of flow**				**Density**	**Absolute viscosity**	**Relative viscosity**	**Kinetic viscosity**
	I	**II**	**III**	**Avg.**				
Water	38s	39s	39s	39s	1 g/ml	--	--	--
Gel	153	151	154	153s	0.1 g/ml	0.3963	0.3963	3.963

Figure 13 – Ostwald Viscometer

9) Spreadiability

The gel was taken and spread on a clean dry glass surface and a graph paper was placed below the glass to check the spread ability. Initially when the drop of gel was spotted on the glass 0.25 cm^2 area was covered. When the gel was pressed the area of spreading was increased to 49 cm^2. Similar test was performed with the combination of gel and powder where the test resulted in decrease of the spread area due to the granular lentil particles. The area of spread in this case was found to be 6.25 cm^2.

Figure 15 – Spreadiability of Gel

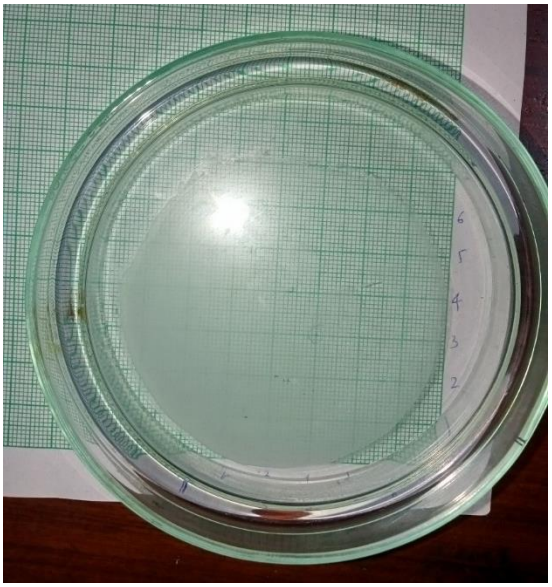


Figure 14 – Initial Spotting of Gel

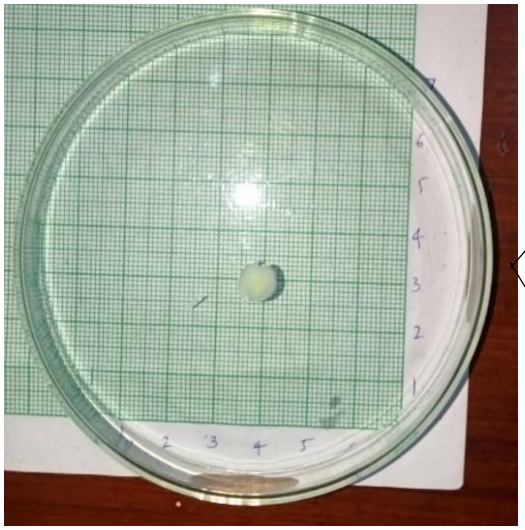
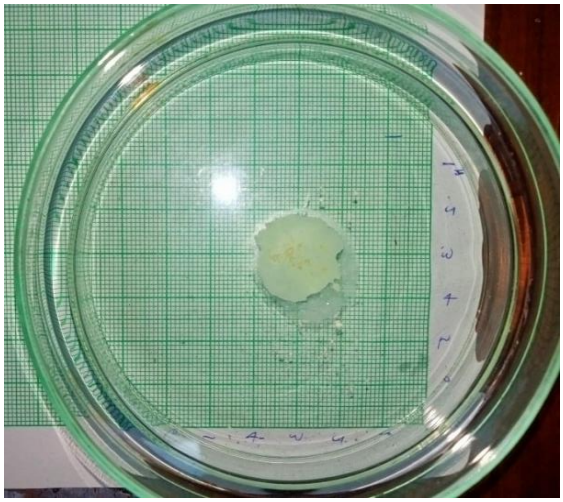


Figure 16 – Spreadiability of Gel + Lentil Powder



RESULT

1) Review About Face Pack

The formulated face pack were provided to different individuals and the response were noted. Herein the effect of face pack on different factors like tanning, oiliness. Tanning, skin glow, pimple and dark spots, etc were noted on different face types. The face pack when used continuously for a week showed some good and effective results. Most favoured area of excellent of the gel was for the skin glow wherein individual find the gel to impart glow on their face type. The oil removal properties of the skin are also effective but to a lesser extent. Overall, the gel when used with lentil powder is proven to be effective and having no side effects and any type of irritation.

INDIVIDUAL NAME	NO. OF DAYS USED	RESPONSE MARK WITH PERCENTAGE OUT OF 100%					
		OIL REMOVAL	DIRT REMOVAL	DARK SPOT REMOVAL	PIMPLE EFFECT	SKIN GLOW	REVIEW
SUMIT	7	90	95	100	90	100	EFFECTIVE
PRIYA	7	93	95	90	100	93	GOOD
POOJA	7	90	90	80	100	95	GOOD
PRANIT	7	95	100	80	80	94	PRODUCTIVE
VIKAS	7	90	85	90	85	100	GOOD & USEFULL

2) Precautions To Be Taken

To achieve the best results and avoid adverse effects when using a face pack, it is essential to take some precautions. First, conduct a patch test on a small area of your skin to check for allergic reactions before applying it to your entire face. Ensure your face is thoroughly cleansed to remove dirt, oil, or makeup. Be cautious around the delicate eye area and avoid applying the pack too close. Always follow the instructions on the packaging, including the recommended duration. Do not overuse face packs; applying them 1-2 times a week is usually sufficient. Lastly, keep your skin hydrated after use and protect it from sun exposure if stepping outdoors.

CONCLUSION

The face pack formulated using different natural ingredients is a solution to many problems arise by the synthetic chemically produced face pack. It is found to be effective for various skin problems like dark spots, pimples, oily skin, etc. The face pack shows no side effect on different skin type and can be used daily. The extract used in this face pack exhibit various pharmacological activities including antioxidant, anti- inflammatory, antipyretic, etc. It is also used for treating microbial problems and thus is found to be antimicrobial and insecticidal as well. The face pack also shows great health benefits due to addition of lentil powder. It could be used on daily basis or twice a week for better outcome. After studies of the toxin properties, durability, any rare side effect, etc can be further studies so as to increase the efficiency of the face pack. Thus, it can be a potent alternative for synthetic face pack and help to achieve natural glow on face.

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