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RESEARCH ARTICLE ON FORMULATION AND EVALUATION OF POLY HERBAL FACE SHEET MASK

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ABSTRACT:

This research focuses on the formulation and evaluation of a polyherbal face sheet mask. On a daily basis, human skin is exposed to various concerns such as early pimples, acne, sun damage, and dark spots, particularly among adults. With increasing awareness about the benefits of natural and chemical-free skincare, more people are shifting towards herbal products. These masks, made from plant-based ingredients, are considered safe and effective, offering benefits like skin brightening, deep cleansing, soothing irritation, providing hydration, and minimizing signs of aging. Herbal face masks are well-suited for everyday use as they are gentler on the skin and have fewer side effects than synthetic alternatives, gaining wide acceptance in natural skincare routines. By using mild, chemical-free compounds, the research demonstrates how herbal sheet masks can effectively combat dullness, acne, and dryness, while promoting a healthy, radiant, and refreshed complexion. These masks consist of thin fabric or cellulose sheets infused with a nutrient-rich serum, designed to deliver active ingredients directly to the skin.

This study focuses on developing a facial serum for sheet masks using a selection of natural ingredients known for their antimicrobial, anti-inflammatory, anti-acne, antioxidant, anti-pigmentation, skin-brightening, and calming properties. Each component was chosen to target specific skin concerns and improve overall skin clarity, health, and radiance. Herbal face serums have gained popularity among eco-conscious users for being both mild and effective. They are characterized by a lightweight, non-greasy texture and a high concentration of bioactive natural compounds. These serums are easily and rapidly absorbed, allowing nutrients to penetrate the skin more deeply to nourish and revitalize it. As a result, they help boost skin health and radiance. The herbal formulation incorporates dragon fruit extract for its antioxidant activity and Anti-aging property, Kiwi fruit extract for Anti-inflammatory activity, papaya fruit extract for exfoliation of skin and remove dead skin cells, lemon grass extract works as anti-microbial agent, Glycerine provide hydration and act as humectant, and rose water used as soothing agent. The product is assessed through key evaluation parameters such as organoleptic characteristics, pH measurement, skin irritation testing, spreadability, sheet absorption capacity, and stability studies, all of which are crucial for determining the overall quality and performance of the herbal face sheet mask.

KEYWORDS: Herbal face sheet mask, Herbal extracts, Fruits, Dragón fruit, Kiwi fruit.

INTRODUCTION:

Natural cosmetics are beauty products formulated from natural herbs that support the care and enhancement of appearance and personality. Applied externally, they help cleanse, nourish, and beautify the body. Free from harsh chemicals, these products provide gentle care using nature-based ingredients. Their purpose is to promote healthy skin, improve looks, and serve as a safe, environmentally friendly option for personal care and grooming.[1]

Structure of skin:

The skin is made up of different layers, The epidermis, which is the outermost layer, is primarily formed of keratinocytes. Just beneath it lies the basement membrane (or dermo-epidermal junction), a thin, multi-layered structure that connects and secures the epidermis to the dermis. Below the dermis is the hypodermis.[2]

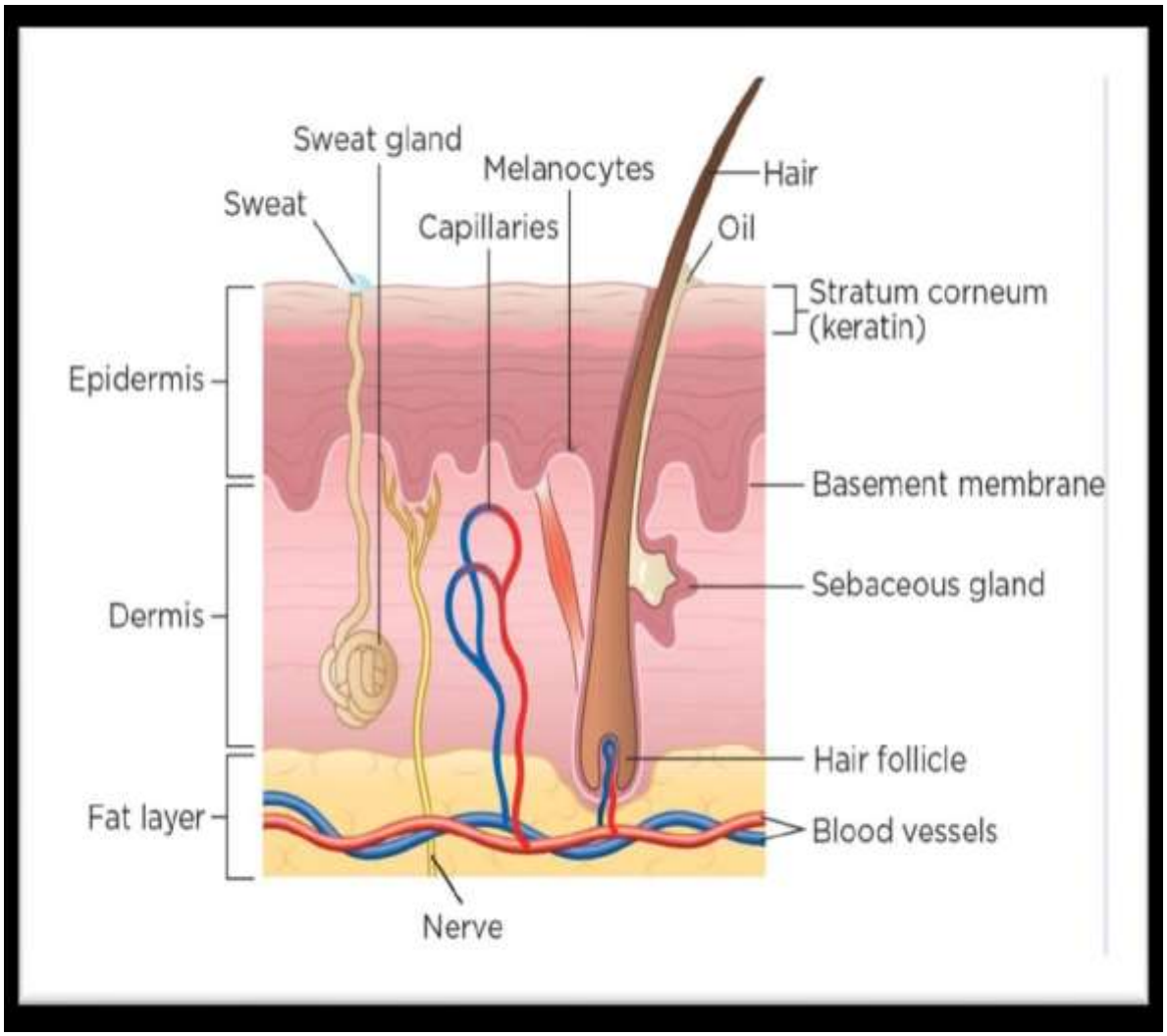

Figure No. 1 Structure of skin

Type of cosmetic formulation:

Cosmetic formulations are generally grouped into three main types: Solid, Semi-solid, and Liquid.

- Solid cosmetics include products such as face packs, facial masks, talcum powders, and compact powders, which are applied in dry form.

- Semi-solid formulations consist of items like creams, ointments, liniments, and wax-based creams, typically used for moisturizing or therapeutic purposes.
- Liquid cosmetics cover a wide range of products, including shampoos, mouthwashes, deodorants, hair oils, conditioners, moisturizers, cleansing milk, sprays, and liniments, which are usually fluid in nature and easy to apply.[3]

TYPES OF FACE MASKS:

There are various types of face masks made to address various skin needs:

1. Sheet Masks: These are fabric sheets soaked with active ingredients like whitening agents, anti-aging compounds, or oil control ingredients. The sheet helps keep the serum stable and enhances absorption, requiring fewer added chemicals.
2. Peel-Off Masks: These masks form a thin layer on the skin that, when dry, can be peeled off. They help cleanse, refresh, and remove dead skin cells, revealing smoother and more youthful skin.
3. Leave-On Masks: Usually creams or gels, these masks provide deep hydration and these masks provide deep hydration and are left on the skin for some time or overnight to be absorbed fully.
4. Charcoal or Clay Masks: These thick masks work as deep cleansers using natural clays or charcoal to draw out impurities, though they must be carefully formulated to avoid bacterial growth.[4]

Serum:

Serum is a highly concentrated skincare product that is widely used in cosmetology. The term itself has become a professional concept in this field. Compared to regular creams, serums are far more potent, often containing up to ten times more active ingredients. Because of this high concentration, they are able to address skin concerns more effectively and in less time. With the rising global cost of living, the demand for cosmetic products has increased, as many people are eager to maintain a youthful and attractive appearance. Serums are typically formulated as gels, lightweight lotions, or moisturizers, and they are designed to penetrate deeply into the skin to deliver active ingredients.[6]

Face sheet mask:

Along with various cosmetics product, Face sheet masks have gained popularity in skincare due to their convenience,



quick results, and attractive appearance. These masks are usually made from fabric or bio cellulose material infused with serums rich in active ingredients. When applied, they create a barrier that helps the skin absorb nutrients more effectively. Their ability to deeply hydrate and nourish the skin in a short time makes them ideal for busy users. Technological advances have also allowed the development of masks tailored to specific skin types and concerns like dryness, dullness, acne, and aging.[5]

Figure No. 2 Face sheet mask

STEPS TO USE FACE SHEET MASK:

i. Soaking face sheet mask-Before applying a sheet mask, it should be soaked in serum for about 10–15 minutes to ensure the fabric is fully infused. This process is essential as it enables the mask to take in all the beneficial active ingredients from the serum. Once placed on the face, a thoroughly saturated mask delivers these nutrients deep into the skin, boosting moisture, refining texture, and providing optimal skincare results**.**

ii. Begin with Cleansing Your Skin- Before starting any skincare routine, it is important to wash your face thoroughly. Choose a mild facial cleanser and use lukewarm water to gently remove oil, dirt, and impurities without causing irritation. Work the cleanser into a soft lather with gentle motions, then rinse it off well. Once clean, lightly pat your face with a soft towel so the skin is damp but not completely dry.

iii. Use a Toner- Once you have cleansed your face, the following step is to apply toner. A toner revitalizes the skin, clears away any remaining traces of dirt or cleanser, and helps maintain the skin's natural pH level. Pour a small amount onto a cotton pad or your palms and gently glide it over your face. Let it absorb completely, ensuring the skin feels fresh, moisturized, and ready for further skincare steps.

iv. Placing the Sheet Mask- Begin by positioning the sheet mask on your face, starting from the forehead and then aligning it carefully over the eyes, nose, mouth, and chin. Smooth it outward with gentle motions to remove any folds or air bubbles so the mask adheres closely to the skin.

v. Relax for 20 Minutes- Leave the mask on for about 20 minutes without shifting it. Use this time to relax whether by reading, watching TV, meditating, or simply resting allowing the mask to work effectively while you unwind.

vi. Remove face sheet mask- After Removing the Sheet Mask do not wash your face once you take off the mask. The leftover essence on your skin is a nutrient-rich serum that provides added benefits. Instead of cleansing it away, gently pat the remaining product into your skin with your fingertips until it is mostly absorbed. This allows the active ingredients to penetrate deeply, making the mask more effective and maximizing its results.

vii. Apply Eye Cream or Moisturizer: To complete your skincare routine, you may apply an additional layer of serum if your skin requires it, though sheet masks already deliver a concentrated dose. Follow this with an eye cream and a moisturizer to seal in the nutrients and hydration, support skin cell renewal, and boost overall radiance. Adjust this step based on your skin's needs and comfort.[7]



Figure No.3 Steps to apply face sheet mask

MATERIAL'S

Plant material consists of natural substances obtained from plants, which are included in formulations to help improve the performance and benefits of the final product.The ingredients used are listed below: -

1. Dragon fruit extract
2. Kiwi Pulp Extract
3. Lemongrass Extract
4. Papaya fruit Extract
5. Glycerine
6. Rose water

1) Dragon fruit Extract:



Figure No.4 Dragan fruit

- Biological name - Selenicereus undatus or Hylocereus undatus
- Family – Cactaceae
- Phytoconstituents - The phytochemicals present in dragon fruit or pitaya include carbohydrates, proteins, saponins, phenolic compounds, terpenoids, oils, flavonoids, tannins, phenols, coumarin, and steroids.[8]

2) Kiwi fruit extract:



Figure No. 5 Kiwi fruit

- Biological Name- Actinidia deliciosa
- Family- Actinidiaceae
- Phytoconstituents - Kiwifruit contains a wide variety of beneficial phytochemicals, including triterpenoids, saponins, and several types of phenolic compounds such as flavonoids, polyphenols, anthraquinones, and coumarins. It is also rich in essential vitamins and minerals, contributing to its nutritional and health-promoting properties.[9]

3) Lemon grass extract:



Figure No.6 Lemon grass

- Biological name- Cymbopogan flexuosus
- Family - Poaceae
- Phytoconstituents-Lemongrass leaves are packed with various bioactive compounds such as alkaloids, flavonoids, terpenoids, saponins, phenols, and tannins, which together contribute to their unique flavour and aroma.[10]

4) Papaya fruit extract:



Figure No.7 Papaya fruit

- Biological name - Carica papaya L.
- Family – Caricaceae
- Phytoconstituents – Phytochemical present in papaya like alkaloids, carotenoids, flavonoids, kaempferol, myricetin, quercetin and carotenoids – lycopene, zeaxanthin, cryptoxanthin, β-carotene and violaxanthin, and vitamins.[11]

5) Rose water:

- Biological name- Rosa damascena
- Family- Rosaceae



Figure No.8 Rose water

Rose water, derived from Rosa damascena and Rosa centifolia of the Rosaceae family, was first discovered in ancient Persia and has long been valued for its skin benefits. Traditionally used in facial and skincare remedies, rose oil is known for its moisturizing properties. It is often incorporated into face masks and treatments, with historical records suggesting that Cleopatra, renowned for her beauty, used it in her skincare routine. In diluted form, rose oil also serves as a gentle cleansing agent and skin toner, helping to refresh and nourish the skin while maintaining its natural hydration and glow.[12]

6) Glycerine:



Figure No.9 Glycerine

In the formulation, 4–5 drops of glycerin were added to act as a moisturizing agent. As a humectant, glycerin draws moisture from the surrounding environment and locks it into the skin, helping to keep it hydrated, supple, and protected from dryness. In a peel-off mask, it not only boosts skin moisture retention but also creates a protective layer that shields against environmental factors like pollution and harsh weather, strengthening the skin's natural defences. Glycerin also works as an emollient, making the skin softer and smoother. Its presence improves the texture, spreadability, and even application of the mask while ensuring it can be removed comfortably, enhancing the overall skincare experience [13]

METHODOLOGY OF FACE SHEET MASK:

i. The serum formulation and sheet mask soaking process began with the complete sterilization of all equipment and glassware to maintain hygiene and avoid contamination.

ii. First, the aqueous phase was prepared by mixing distilled water, glycerin, and selected fruit extracts (dragon fruit, kiwi, and papaya) in a clean beaker.

iii. Continuously stirred with a magnetic stirrer for about 15–20 minutes to ensure even blending.

iv. Next, lemongrass extract were gently added to the mixture while maintaining constant stirring to achieve proper solubilization.

v. In a separate container, rose water was prepared and then slowly incorporated into the aqueous mixture while stirring at moderate speed, resulting in a uniform mixing.

vi. To improve the consistency and homogeneity of the serum, this final blend was stirred for an additional 30 minutes with adding preservative.

vii. Once the serum was ready, pre-cut biodegradable sheet masks made from cotton or cellulose were sterilized and placed into clean containers.

viii. The prepared herbal serum was poured over the masks until they were fully saturated, then left at room temperature for 2–3 hours to allow complete absorption.

ix. Finally, each mask was individually packed in airtight, sterilized pouches for storage. [14]

Sr.no.	INGREDIENTS	QUANTITY	PROPERTIES
1	Dragon fruit extract	4.5 ml	Antioxidant
2	Kiwi fruit extract	4.5 ml	Complexion enhancer
3	Papaya fruit extract	4.5 ml	Exfoliation
4	Lemongrass extract	3.0 ml	Anti-microbial agent
5	Rose water	2.0 ml	Soothing Agent
6	Glycerine	6.0 ml	Humectant, Moisturizer
	Methyl paraben	0.3%	Preservative
7	Propyl paraben	0.3%	Preservative
8	Distilled water	Q.S to 100 ml	Solvent

- Table No. 1:-

Formulation of hebal face sheet.

EVALUATION PARAMETER

- Organoleptic evaluation:

Assessing its color, odor, and texture. The appearance of the cream was evaluated based on its color and smoothness. [14]

- pH of the Serum:

The pH level is an important factor in determining how stable and effective the serum will be, as well as how well it works with the skin. Since healthy human skin usually has a slightly acidic pH between 3.5 and 6.5, a good serum should fall within this range. This helps support the skin's natural barrier and protects against harmful microbes. If the pH is too high or too low, it can cause problems like dryness, irritation, redness, or sensitivity. [14]

- Irritancy Evaluation:

The irritancy test is conducted to determine whether a serum may cause skin irritation or unwanted reactions. This step is particularly important for formulations intended for sensitive skin. The assessment can be carried out through patch tests on human volunteers or by using in vitro models such as reconstructed human epidermis. Indicators like redness, itching, or burning are observed over a defined time period. A formulation showing little to no irritant effect is considered more skin-friendly and safer for prolonged use. [14]

- Homogeneity:

When checking a serum, look for a uniform and smooth appearance. A properly blended serum should have an even texture throughout, without any clumps, lumps, or uneven patches. [14]

- Microbial testing of the formulated serum:

It was performed to verify its safety and stability. For this, the serum was inoculated onto agar plates using the streak plate technique and incubated at 37 °C for 24 hours. After incubation, the plates were inspected for any signs of microbial colonies and compared against a control plate containing no serum. This procedure helped determine both the antimicrobial activity of the serum and its potential role in promoting skin health. [14]

- Sheet Absorption:

To evaluate this, a cotton sheet is immersed in the serum to measure how much of the product it can take up and to assess how easily the serum gets absorbed by the sheet. [15]

RESULT AND DISCUSSION:

An herbal face sheet mask was successfully developed by incorporating a blend of natural extracts to provide both cosmetic and therapeutic benefits. The mask's serum displayed excellent solubility and formed a uniform solution, allowing even distribution of active plant-derived ingredients across the sheet surface. The formulation maintained a skin-compatible pH range of normal pH, minimizing irritation risks and making it appropriate for regular use, even on sensitive skin. Post-application results showed smoother, refreshed skin with improved softness and glow. The synergistic action of multiple herbal extracts further boosted its efficacy by soothing irritation, aiding barrier restoration, and protecting skin from oxidative stress. Collectively, these effects elevated the mask's overall performance, establishing it as a versatile skincare solution. [15]

CONCLUSION:

The study aimed to develop a natural polyherbal sheet mask using plant-based extracts for targeted skin benefits. Dragon fruit provided antioxidant activity and anti-aging activity, kiwi enhanced complexion and act as anti-

inflammatory, papaya acted as an exfoliant, and lemongrass offered antimicrobial effects, glycerin ensured hydration, and rose oil soothed and improved skin texture. Evaluation confirmed successful formulation, with stability testing recommending storage at room temperature. The sheet acted as a carrier, enhancing serum absorption. Applied two to three times weekly for 10–20 minutes, the mask improves skin brightness, reduces blemishes, and leaves a refreshed, glowing appearance.

REFRENCES:

1. Mushtaq A, Khan MA and Zafar M: Traditional herbal cosmetics used by local women communities in district Attock of northern Pakistan. Indian journal of traditional Knowledge 2008;7(3): 421-424.

2. Lawton, S., "Skin 1: the structure and functions of the skin," Nursing Times, vol. 115, pp.30-33, Dec 2019

3. VP Kapoor: Herbal cosmetics for skin and hair care, National Botanical Research Institute, Lucknow, vol 4(4) July August -2005.

4. Ajay, B.R., Shyam, A., and Kavitha, P.N. (n.d.): A study on preparation and evaluation of herbal peel off face mask Ijfmr.com. Retrieved April 17, 2024, from https://www.ijfmr.com/papers/2023/5/6812.pdf.

5. Janssen-Bocker C, Wiesweg K, Doberenz C. Native collagen sheet mask improves skin health and appearance: A comprehensive clinical evaluation. Journal of cosmetics dermatology. 2024 May;23(5):1685-702. https://doi.org/10.1111/jocd.16181

6. Vidhi P, Deeksha S, Deep V. Formulation and evaluation of polyherbal face sheet mask, B. Pharmacy college Rampura.

7. Dhawale P, Turke V, Khobragade S, Kathade P, Kathade P. Formulation and evaluation of polyherbal face mask. International Journal of Advance Research and Innovative Ideas in Education (IJARIIE), 10(4), 1430–1439.

8. Mello FR De, Bernardo C, Dias CO, Zuge LCB, Shiveira JLM, Amante ER, et al. Evaluation of chemical characteristics and rheological behaviour of pitaya peel. Fruits. 2014;69(5):381-390.

9. D. Satpal, J. Kaur, V. Bhadariya, and K. Sharma, "Actinidia deliciosa (Kiwi fruit): A comprehensive review on the nutritional composition, health benefits, traditional utilization, and commercialization," J. Food Process. Preserv., vol. 45, no. 6, 2021, doi: 10.1111/jfpp.15588

10. Muala, W.C.B.; Desobgo, Z.S.C.; Jong, N.E. Optimization of extraction conditions of phenolic compounds from Cymbopogon citratus and evaluation of phenolics and aroma profiles of extract. Heliyon 2021,7, e06744.

11. Gayosso-Garcia Sancho,L. E., Yahia, E. M.,and Gonzale-Aguilar, G.A. (2011).Identificaton and qualification of phenols,carotenoids,vitamin C from papayafruit determined by HPLC-Dad-MS/MS-ESI. Food Research International,44(5),1284-1291.https://doi.org/10.1016/j.foodres.2010.12.001

12. Razz M, Rani B. Intrinsic benefits and therapeutic applications of rose water. Universal journal of pharmacy.2(2);2013:4-7

13. The effect of glycerin and polyethylene glycol 400 as humectant on stability and anti-bacterial activity of nanosilver biosynthetic peel off mask. Journal of Applied Pharmaceutical Science,12(4), pp.080-089

14. Kujur N, Bhattacharya M, Sahu K, Sahu S, Sahu S. Formulation and evaluation of herbal face sheet mask. International Journal of Progressive Research in Engineering Management and Science (IJPREMS), 5(5), 2028–2033.

15. Patel V, Saini D, Varia D. Formulation and evaluation of polyherbal sheet mask. International Journal of Pharmaceutical Research and Applications (IJPRA), 9(2), 1855–