



# FORMULATION AND EVALUATION OF HARBAL FACE PACK

**Ms. Taware Babita Santosh<sup>1</sup>, Ms. Gaikwad Nikita Sanjay<sup>1</sup>, Prof. Vikram Pansare<sup>2</sup>.**

Student, Department of Pharmaceutical Science<sup>1</sup>

Assistant Professor, Department of Pharmaceutical Science<sup>2</sup>

Saikrupa Institute of Pharmacy, Ghargaon, Ahmednagar, Maharashtra, India

**Corresponding Author: Mr. Vikram Jayshing Pansare,**

Assistant Professor, Department of Pharmaceutical Science. Saikrupa Institute of Pharmacy.  
Ghargaon.

Ahmednagar, Maharashtra, India 413728.

Email ID: vikrampansare555@gmail.com

Mobile No. 9579051212.

## ABSTRACT:

The aim of this work is to formulate and evaluate an herbal face pack for glowing skin by using natural herbal ingredients. The natural herbal ingredients such as multani mitti, turmeric, sandalwood, milk powder, rice flour, gram flour, curry leaves powder, The powder of banana peel was prepared by shade drying commercially, all powdered natural ingredients were sieved using #120 mesh, weighed accurately and mixed geometrically for uniform formulation and then evaluated for parameters including morphological, physicochemical, physical, phytochemical, irritancy along with stability examination. Thus, in the present work, we formulated an herbal face pack which can be easily made with the easily available ingredients. After evaluation, we found good properties for the face packs, free from skin irritation and maintained its consistency even after stability storage conditions. Results of the study scientifically verified that herbal face pack having enough potential to give efficient glowing effect on skin. The overall study is useful to substantiate product claims due its useful benefits on the human beings.

Key words : Face pack, Evaluation , Benefits.

## INTRODUCTION OF SKIN<sup>(1,2)</sup>:

**1.Introduction of Skin:** The skin is the largest organ of the body, accounting for about 15% of the total shalt body weight. It performs many vital functions, including protection against external physical, chemical, and biologic assailants, as well as prevention of water loss from the body and a role in thermoregulation The skin is our Hady's external covering that proteins freon heat, light, microbial infection, and injury. It is the body's largest organ, controlling body temperature and storing vitamin D, which is essential for human health, as well as fat and water. Wrinkles, skit dis ciondion, and dullness who considered serious problems. The skin

protects from microorganisms and the weather, sides in body temperature regulation, and allows us to experience touch, heat, and cold sensations.

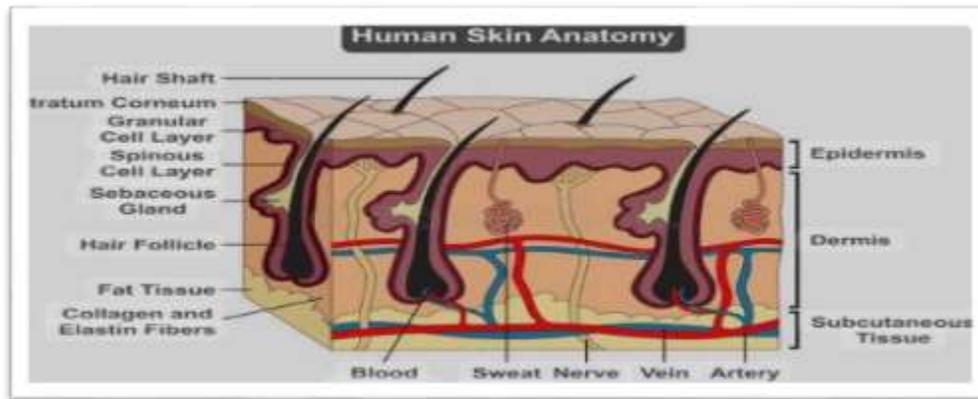


Fig.1.Skin Structure

## 2. Skin has three layers<sup>(3,4,5,6)</sup>:

The epidermis, the outermost layer of skin, provides a waterproof barrier and creates our skin tone the dermis, beneath the epidermis, contains tough connective tissue, hair follicle

**A) Stratum spinosum (prickly cell layer):** 8-10 cell layers, also known as the prickle cell layer contains irregular, polyhedral cells with cytoplasmic processes, sometimes called "spines", that extend outward and contact neighbouring cells by desmosomes. Dendritic cells can be found in this layer.

**B) Stratum Germinativum (basal layer):** It is the deepest layer, separated from the dermis by the basement membrane (basal lamina) and attached to the basement membrane by hemidesmosomes. The cells found in this layer are cuboidal to columnar mitotically active stem cells that are constantly producing keratinocytes. This layer also contains melanocytes.

**C) Dermis:** Dermis is the second deeper region lying in between the epidermis and subcutaneous fatty region. It is formed from connective tissues containing collagen and elastin fibres including few cells as fibroblast, macrophages and adipocyte Hypodermis; It is subcutaneous layer which lies deep to the dermis, but not the part of the skin.

## 3. Functions of Skin<sup>(7,8,9,10)</sup>

- It provides a protective waterproof coating that protects against damage, microbial invasion chemical agents, and other environmental agents
- It secretes sodium chloride and metabolites like urea.
- It also helps in maintaining water and electrolyte balance.
- It helps in synthesis of vitamin D from ergosterol of skin by the action of UV rays of starlight.
- It synthesizes melanin from tyrosine. It secretes and sebum which keeps skin soft.
- It stores fat, water, chlorides, and sugar. It secretes and sebum which keeps skin soft.
- Reduces harmful effects of UV radiation.
- Acts as a sensory organ (touch, detects temperature).
- Helps regulate temperature.

## # Why Skin Care is Important<sup>(11,12)</sup>

**1. Maintains Skin Health :** Skin care helps to maintain the skin's natural barrier function, preventing water loss and protecting against external stressors like pollution, UV radiation, and pathogens.

**2. Prevents Premature Aging:** A consistent skin care routine can help prevent premature aging, reducing the appearance of fine lines, wrinkles, and age spots.

**3. Boosts Confidence:** Healthy, glowing skin can boost self-confidence and self-esteem, making us feel more comfortable in our own skin.

**4. Improves Skin Texture:** Skin care can improve skin texture, making it look smoother, softer, and more even-toned.

**5. Reduces Skin Issues:** A good skin care routine can help reduce skin issues like acne, rosacea, and eczema.

## # Benefits of Skin Care<sup>(13,14)</sup>

**1. Hydration:** Skin care helps to lock in moisture, keeping the skin hydrated and supple.

**2. Exfoliation:** Regular exfoliation removes dead skin cells, revealing brighter, smoother skin.

**3. Protection:** Skin care products containing antioxidants and SPF help protect the skin from environmental stressors and UV radiation.

**4. Collagen Production:** Certain skin care ingredients, like retinol and peptides, can stimulate collagen production, improving skin elasticity and firmness.

**5. Improved Skin Tone:** Skin care can help even out skin tone, reducing the appearance of hyperpigmentation and dark spots.

### # Essential Skin Care Steps

**1. Cleansing:** Remove dirt, makeup, and impurities with a gentle cleanser.

**2. Exfoliating:** Use a physical or chemical exfoliant to remove dead skin cells and improve skin texture.

**3. Toning:** Balance the skin's pH and tighten pores with a toner.

**4. Essence:** Apply an essence to deliver active ingredients and help with skin texture and tone.

**5. Serum:** Use a serum containing concentrated active ingredients to address specific skin concerns.

**6. Moisturizing:** Lock in moisture and protect the skin with a moisturizer.

**7. Sunscreen:** Apply a broad-spectrum sunscreen with at least SPF 30 daily.

### # Tips for Effective Skin Care

**1. Be Consistent:** Stick to a consistent skin care routine to see noticeable results.

**2. Use Gentle Products:** Choose products suitable for your skin type, and avoid harsh ingredients that can strip the skin of its natural oils.

**3. Don't Over-Exfoliate:** Exfoliate 1-3 times a week, depending on your skin type and concerns.

**4. Stay Hydrated:** Drink plenty of water to keep your skin hydrated from the inside out.

**5. Get Enough Sleep:** Aim for 7-8 hours of sleep per night to help your skin regenerate and repair itself.

### Introduction of herbal face pack<sup>(15,16)</sup>:

Everybody wants to get fair and charming skin. Now a day, Acne, black head, pimples, dark circle are common among youngsters and person who suffers from it. According to Ayurveda, Skin problems are normally due to impurities in blood. Accumulated toxins in the blood during improper food and lifestyle are causing skin related diseases. Various herbs, medicines are described in Ayurveda for blood purification. The herbal paste which is applied on face to treat acne, pimple, scars, marks and pigments are known as "Mukha Lepa" in ayurveda. The process of smearing this herbal mix on face is known as "Mukha Lepa". This beauty therapy is popular as facial<sup>1</sup>. The smooth powder which is used for facial application is "face pack". A good herbal face pack must supply necessary nutrients to skin.

Face packs are one of the oldest and beautiful methods of cleansing skin. There are various kinds of face packs described in Ayurveda which have nourishing, healing, cleaning, astringent and antiseptic properties. From the ancient era people are using herbs for cleaning, beautifying and to manage them. Cosmetics are defined as the products used for the purposes of cleansing, beautifying, promoting attractiveness or alternating one's appearance<sup>2</sup>. Homemade natural face packs and masks make way for smooth, radiant and silky skin. Face packs used in ayurveda helps to reduce wrinkles, pimples, acne and dark circles.



**Fig.2.**Herbal Face Pack

They also increase the fairness and smoothness of the skin. The Natural face packs do contain some vital vitamins that are required for the health and glow of our skin. These substances also prove to be beneficial for our skin in many ways. Natural Facial Packs are less complicated and pretty simple to use. They help us in looking after skin and also prove its worthiness by increasing the circulation of the blood within the veins of the

face. Effects of the facial packs are generally temporary and for the regular glow it should be used 2-3 times a week.

This face pack has natural skin lightening property and can be easily prepared at home. Face packs with natural constituents are rich in vital vitamins that are essential for the health and glow of the skin. These substances have been proven to be beneficial for skin in many ways. Natural facial packs are easy to use. They increase the circulation of the blood within the veins of the face, thereby increasing the liveliness of the skin. A good herbal face pack must supply necessary nutrients to the skin, available in the form of free-flowing powder applied facially for the external purpose. It should penetrate deep down the subcutaneous tissues to deliver the required nutrients. Every type of skin is specific for the requirement of skin pack.

### **Benefit of herbal face pack<sup>(17)</sup>:**

- **Deep Cleansing:** Face packs can penetrate deeper than regular cleansers, removing dirt, oil, and impurities that can clog pores and lead to breakouts.
- **Unclogging Pores:** By drawing out impurities and dead skin cells, face packs help to unclog pores and prevent the formation of blackheads and whiteheads.
- **Absorbing Excess Oil:** Certain face packs, particularly those formulated for oily skin, can help absorb excess oil, leaving the skin feeling refreshed and matte.
- **Gentle Exfoliation:** Some face packs contain natural exfoliating ingredients that gently slough away dead skin cells, revealing brighter, smoother skin.
- **Improved Skin Texture:** Regular use of face packs can improve skin texture, making it appear smoother and more radiant.
- **Skin Brightening:** Certain ingredients in face packs, such as turmeric or saffron, can help brighten the skin and reduce the appearance of dark spots and hyperpigmentation.

### **Precautions to be taken while applying face pack<sup>(17)</sup>:**

- The face mask should not be left on the face for more than 15 to 20 min.
- It can be stored for a long time leads to the formation of wrinkles, sagging skin and expansion of open pores.
- Apply the face mask once a week.
- Do not try to peel or dry itchy face pack. It can hurt underlying skin.
- Do not rub the face vigorously.
- This can lead to rash from pimples and brown spots.
- Stay away from warm up when applying the face mask.
- Avoid applying a face mask near the "eye area".
- The skin the eye area is very sensitive.
- The removal process the face mask can damage the skin around the eyes

### **How to Apply Face Pack<sup>(18)</sup>:**

- Take prepared face pack powder in a bowl as per the requirement.
- Add water or rose water to mix it well and apply over the facial skin.
- Cover the acne and blemishes spots.
- Kept as it is for complete drying for 30 to 40 min.
- Then wash the face with cold water.

## **MATERIALS AND METHODS**

**1. Curry Leaves<sup>(19)</sup>:** Curry leaf (*Murraya koenigii*) is a member of the Rutaceae family, which has 150 genera and 1600 species. It has been determined to be native to South Asia, specifically to Bangladesh, India, and Sri Lanka. The first and fourth centuries AD are when *Murraya koenigii* was first used. The whole plant is thought to be tonic and stomachic and has historical applications. In addition to Karuveppilai in Tamil, Mitha Neem in Hindi, and Surabhinimba in Sanskrit [4]. Due to their compound leaves, curry leaf plants can also be utilised as a hedge and decorative shrub.



**Fig.3.**Curry Leaves Powder

Regular application of curry leaf powder can help improve skin tone, reduce dullness, and promote a radiant, healthy glow. The antioxidants in curry leaves can help reduce the appearance of wrinkles and fine lines, contributing to a more youthful complexion. Curry leaves are packed with antioxidants that combat free radicals, protecting skin cells from damage and promoting a youthful appearance. : The anti-inflammatory and antimicrobial properties of curry leaves can help soothe and reduce acne, blemishes, and dark spots.

**2.Banana peel<sup>(20)</sup>:** Banana peel is a natural source of bioactive compounds, which possess a wide range of biological activities, including anticancer, anti-inflammatory, and itch-relieving properties. This review aims to provide an overview of the bioactive constituents in banana peel and their potential for medicinal applications.



**Fig.4.**Banana peel

Moreover, the antiaging and radioprotective properties of the banana peel may be harnessed for pharmaceutical formulations aimed at cancer prevention or treatment. Besides, the antioxidants and anti-inflammatory compounds in the peel may offer benefits for skin health, by helping combat skin ageing, reduce acne, and alleviate skin irritations when applied topically.

**3) Turmeric<sup>(21)</sup>:** - In folk medicine, turmeric has been used in therapeutic preparations over the centuries in different parts of the world. In Ayurvedic practices, turmeric is thought to have many medicinal properties including strengthening the overall energy of the body, relieving gas, dispelling worms, improving digestion, regulating menstruation, dissolving gallstones, and relieving arthritis. Many South Asian countries use it as an antiseptic for cuts, burns, and bruises, and as an antibacterial agent.



**Fig.5.**Turmeric Powder

In Pakistan, it is used as an anti-inflammatory agent, and as a remedy for gastrointestinal discomfort associated with irritable bowel syndrome and other digestive disorders. In Pakistan and Afghanistan, turmeric is used to cleanse wounds and stimulate their recovery by applying it on a piece of burnt cloth that is placed over a wound. Indians use turmeric, in addition to its Ayurvedic applications, to purify blood and remedy skin conditions. Turmeric paste is used by women in some parts of India to remove superfluous hair. Turmeric paste is applied to the skin of the bride and groom before marriage in some parts of India, Bangladesh, and Pakistan, where it is believed to make the skin glow and keep harmful bacteria away from the body. Turmeric is currently used in the formulation of several sunscreens.

#### **4) Milk powder<sup>(22)</sup>**

Powdered milk, also called milk powder, dried milk, or dry milk, is a manufactured dairy product made by evaporating milk to dryness. One purpose of drying milk is to preserve it; milk powder has a far longer shelf life than liquid milk and does not need to be refrigerated, due to its low moisture content. Right from treating acne to giving you younger-looking skin, milk powder has numerous beauty benefits.



**Fig.6.**Milk Powder

It is a rich source of lactic acid and acts as a natural cleanser. Moreover, it is also an excellent source of Vitamin B which helps in the production of the new cells. It is rich in lactic acid which naturally cleans and brightens skin. Besides skin lightening, what makes milk powder an apt ingredient for the skin is the concentration of vitamins and minerals. This acts as a skin purifier. It can also rid the skin of unwanted impurities like blackheads and whiteheads.

**5. Gram flour<sup>(23)</sup>**:- Eating more legumes is a great way to increase your intake of fiber. Because they're such a high source of fiber, many studies show that eating more chickpeas, and pretty much all types of beans/legumes, can reduce the risk of coronary heart disease, obesity and type 2 diabetes. Garbanzo beans also offer a good array of vitamins and minerals and even some antioxidants, including phenolic compounds. They're thought to have calcium and magnesium in an ideal ratio, a very high amount of folate — which is essential for a healthy pregnancy — a good dose of energizing B vitamins, like vitamin B6, and a decent amount of heart-healthy potassium



**Fig.7.Gram Flour**

They even contain some of the powerful antioxidant mineral selenium, as well as iron and plenty of plant-based protein. Gluten-free diets are also becoming more popular, so you'll love the addition of this flour to your pantry if you've recently decided to go gluten-free.

**6.Rice flour** <sup>(24)</sup>:- Rice flour is a finely milled powder made from rice grains. It is widely used in the food industry due to its gluten-free nature and neutral flavour. Rice flour's versatility makes it a popular alternative to wheat flour, as it meets the need of gluten-free, and allergen-free formulation across food, cosmetics, and agricultural industries. Rice flour can also be used in animal feed. It is a gluten-free option that improves palatability, binds feed particles together, and provides essential nutrients, like proteins and vitamins.



**Fig.8.Rice Flour**

As well as being easily digestible, ensuring efficient absorption of nutrients and minimizes digestive problems.

### **7.Sandalwood** <sup>(25)</sup>: -

Sandalwood is a class of woods from trees in the genus *Santalum*. The woods are heavy, yellow, and fine-grained, and, unlike many other aromatic woods, they retain their fragrance for decades. Sandalwood oil is extracted from the woods. Sandalwood is often cited as one of the most expensive woods in the world.



**Fig.9.Sandalwood Powder**

### Procedure for face pack formulation:

1. Weighing: All the required herbal powder for face pack preparation were accurately weighed individually by using digital balance



2. Mixing: All these fine ingredients are mixed thoroughly by mixer to form a homogeneous fine powder.



3. Sieving: Then this powder was passed through sieve, to get the sufficient quantity of fine powder.



4. Collection and storage: The powder mixture was collected and store in suitable plastic polythelene bags. And use for doing evaluation parametres.

## Formulation Table

Sr.no.	Ingredients	Quantity(gm)
1	Curry leves powder	1 gm
2	Banana peel powder	2gm
3	Turmeric	1 gm
4	Milk powder	1 gm
5	Gram flour	1 gm
6	Rice flour	2gm
7	sandalwood	2gm

**Table 1:** Formulation table of herbal face pack

### Evaluation of face pack:

Following evaluation parameters were performed to ensure superiority of prepared face pack.

**A. Organoleptic Properties<sup>(26)</sup>:** Organoleptic properties include its nature, colour, odour, texture, smoothness etc.

**B. Physicochemical Properties<sup>(27)</sup>:** Physicochemical properties were determined including the pH, loss on drying,

**1. pH:** pH of the aqueous solution of formulation was measured by pH meter.

**2. Loss on Drying:** A method commonly used for moisture content determination is the loss-on-drying method, or LOD. It is used to specify many major quality specifications. This is based on the thermo gravimetric principle, in which a substance is heated until no more weight is lost, that is, it is completely dry. At the beginning and after dryness is achieved, the weight of the substance is measured. The final weight loss is calculated, and represents the moisture content of the sample. A variety of techniques is used to bring about vaporization of moisture, including a drying oven heated by gas, which works on convection, and ovens which work by infrared or microwave radiation.

**C. General Powder Properties<sup>(28)</sup>:**

It includes tapped density, bulk density, angle of repose, Hausner's ratio, Carr's index.

**1. Tapped Density:** Tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 100 times. If no dramatic changes are taken until little further volume or mass change was observed. It was expressed in grams per cubic centimetre ( $\text{g}/\text{cm}^3$ ).

**2. Bulk Density:** Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed. This is repeated to get average values. The Bulk Density is calculated by using the below given formula.

Bulk Density = Volume/Mass

**3. Angle of Repose:** It is defined as the maximum angle possible in between the surface and pile of powder to the horizontal line. It required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above method, the angle of repose ( $\theta$ ) Can be calculated by using the formula:

$$\tan^{-1}(h / r)$$

Where,

$\theta$  = Angle of repose,

h = Height of the heap,

r = Radius of the base.

**4. Hausner's Ratio:** It is expressed as the tap density divided by the bulk density.

**5. Carr's Index:** Carr's index is an indication of compressibility of powder.

**6. Washability:** This is the common method for checking the washability of the formulation. The formulation was applied on the skin and then ease and extent of washing with water were checked manually by using 1 liter of water is used to remove all content of the formulation were removed from the water surface.

#### D. Irritancy Test<sup>(29)</sup>:

Mark an area (15 sq.cm) on the left-hand dorsal surface. Definite quantities of prepared face packs were applied to the specified area and time was noted. Irritancy, erythema, edema, was checked if any for regular intervals up to 24 hrs and reported.

#### E. Stabilities studies<sup>(30)</sup>

The stability studies show a slight change in pH of formulation which was stored at 40 Oc and no change were observed at room temperature and at 35oC therw was no change in colour and odour at other mentioned condition of stabilities.

### RESULT AND DISCUSSION

**A. Organoleptic properties of herbal face pack :** Organoleptic properties include its nature, colour, odour, texture, smoothness etc.

Sr.no.	Organoleptic properties	Observation
1	Nature	Powder
2	Colour	Yellowish
3	Odour	Pleasant
4	Texture	Fine
5	Smoothness	Smooth

**Table 2:** Organoleptic Properties of herbal face pack

**B. Physicochemical Properties:** Physicochemical properties were determined including the pH, loss on drying,

Sr.no.	Physicochemical Properties	Observation
1	pH	7.6
2	LOD	3.35gm

**Table 3:** Physicochemical Properties of herbal face pack

#### C. General Powder Properties:

It includes tapped density, bulk density, angle of repose, Hausner's ratio, Carr's index.

Sr.no.	General Powder Properties	Observation
1	Angle of repose	33.11 degree
2	Bulk density	1.85gm/ml
3	Tapped density	3.3gm/ml
4	Carr's index	400
5	Hausner's ratio	1.78

6	Washability	Washable
	Nature of face after wash	Soft and clean

**Table 4:** General Powder Properties of herbal face pack**D. Irritancy Test:**

Mark an area (15 sq.cm) on the left-hand dorsal surface. Definite quantities of prepared face packs were applied to the specified area and time was noted. Irritancy, erythema, edema, was checked if any for regular intervals up to 24 hrs and reported.

Sr.no.	Parameters	Observation
1	Irritant	No
2	Erythema	No
3	Edema	No

**Table 5:** Irritancy Test of herbal face pack**E. Stabilities studies**

The stability studies show a slight change in pH of formulation which was stored at 40°C and no change were observed at room temperature and at 35°C there was no change in colour and odour at other mentioned condition of stabilities.

Sr.no	Parameters	Room temperature	400C
1	Colour	No change	No change
2	Odour	No change	No change
3	pH	7.6	7.6
4	Texture	Fine	Fine
5	Smoothness	Smooth	Smooth

**Table 6:** Stabilities studies of herbal face pack**CONCLUSION**

Natural Remedies Are More Acceptable in The Belief That They Are Safer with Fewer Side Effects Than the Synthetic Ones. Herbal Formulations Have Growing Demand in The World Market. Herbal Face Packs Are Used to Stimulate Blood Circulation, Rejuvenate the Muscles and Help to Maintain the Elasticity of The Skin and Remove Dirt from Skin Pores. It Is an Our Good Attempt to Formulate the Herbal Face Pack Containing Natural Herbal Ingredients After Evaluation, We Found Good Properties for The Face Packs, Free from Skin Irritation and Maintained Its Consistency Even After Stability Storage Conditions There is a growing demand for herbal preparations in the commercial world. Creating an herbal face mask containing different herbal powders is a good experiment. Therefore, in the current study, we found that the mask has good properties and further research is needed in this study to see the benefits of the herbal face pack for human use in cosmetics making.

**REFERENCES**

- 1) <https://www.ncbi.nlm.nih.gov/books/NBK470464/>
- 2) Herskovitz I, Macquhae F, Fox JD, Kirsner RS. Skin movement, wound repair and development of engineered skin. *Exp Dermatol.* 2016 Feb;25(2):99-100. [PubMed]
- 3) Maranduca MA, Branisteanu D, Serban DN, Branisteanu DC, Stoleriu G, Manolache N, Serban IL. Synthesis and physiological implications of melanic pigments. *Oncol Lett.* 2019 May;17(5):4183-4187. [PMC free article] [PubMed]
- 4) Someya T, Amagai M. Toward a new generation of smart skins. *Nat Biotechnol.* 2019 Apr;37(4):382-388. [PubMed]
- 5) Vandamme N, Berx G. From neural crest cells to melanocytes: cellular plasticity during development and beyond. *Cell Mol Life Sci.* 2019 May;76(10):1919-1934. [PMC free article] [PubMed]

- 6) Vilas Boas P, Cerroni L, Requena L. Intravascular Cutaneous Disorders. A Clinicopathologic Review. *Am J Dermatopathol.* 2021 Feb 01;43(2):119-136. [PubMed]
- 7) E.E. Tredget et al. Hypertrophic scars, keloids, and contractures. The cellular and molecular basis for therapies. *Clin North Am* (1997)
- 8) E.E. Tredget et al. Biology and principles of scar management and burn reconstruction. *Surg Clin North Am* (2014) All Parliamentary Group on Skin (1997) An Investigation into the Adequacy of Service Provision and Treatments for Patients with Skin Diseases in the UK. [Bit.ly/APGSkin](https://bit.ly/APGSkin) Amirlak B, Shahabi L (2017) *Skin Anatomy.*
- 9) Biga LM et al (2019) *Anatomy and Physiology. The integumentary system 5.1: layers of the skin.*
- 10) [https://Bit.ly/SkinConditionsUK](https://bit.ly/SkinConditionsUK)
- 11) Proksch E, Brandner JM, Jensen JM. The skin: an indispensable barrier. *Experimental Dermatology.* 2008;17(12):1063–72.
- 12) Elias P. Stratum Corneum Defensive Functions: An Integrated View. *The Journal of investigative dermatology.* 2005 Sep 1;125:183–200.
- 13) Kessler R. More than Cosmetic Changes: Taking Stock of Personal Care Product Safety. *Environ Health Perspect*; DOI:10.1289/ehp.123-A120 [1] Archived 2015-09-08 at the Wayback Machine
- 14) Schwanitz HJ, Riehl U, Schlesinger T, et al. (2003). "Skin care management: educational aspects". *Int Arch Occup Environ Health.*
- 15) Mary P. Lupo. 2001 ✓ Antioxidants and Vitamins in Cosmetics. a variety of vitamins and antioxidants may also improve the health and quality of your skin. Here are a few of the most effective ones: Vitamins C and E. *Clin Dermatol* 2001; 19: 467– 473. 3. Sachin B.
- 16) L. E. Millikan, *Cosmetology, cosmetics, cosmeceuticals: definitions and regulations*, *Clin Dermatol.*, 2001;19(4): 371-374.
- 17) Martin M. Rieger, *Harry's Cosmetology, Face, and Body & Hair Masks & Scrubs*, Chemical Publishing Co., Inc, Chapter 23, 8th edition, 2009;471-483.
- 18) Maheshwaram Laxmi and S. Vijayalaxmi, Development and Evaluation of Herbal Face Pack Using Various Plant Powders, *Indo American Journal of Pharmaceutical Sciences*, 2017;4(9):3342-3346.
- 19) Nayak A, Mandal S, Banerji A, Banerji J., Review on chemistry and pharmacology of *Murraya koenigii* Spreng (Rutaceae), *Journal of Chemical and Pharmaceutical Research.*, 2010, 2(2), 286-299.
- 20) Vu HT, Scarlett CJ & Vuong QV (2018).
- 21) Ravindran PN, Nirmal Babu K, Sivaraman K. Turmeric. The golden spice of life. In: *Turmeric. The Genus Curcuma*. Boca Raton, FL, USA: CRC Press; 2007. p. 1-14.
- 22) Nutmeg: A review on uses and biological properties. Naeem, Namra. Faisalabad : *International Journal of Chemical and Biochemical Sciences*, 2016, p. 107.
- 23) Ministry of Agriculture Data and Information System Center "Annual Productivity Number of Crop Commodities (Ku/Ha) in 2013-2017" Accessed from <https://aplikasi2.pertanian.go.id/-bdsp> pada 15 September 2019 (2016). Ministry of Agriculture Of The Republic Of Indonesia
- 24) Dzulfakar M A, Kofli N T, Tasirin S M. 2015 An initial study on the influence of natural fermentation on particle size changes during the production of bedak sejuk. *Journal Engineering Science and Technology.* 10 (Spec. issue4) 71-8.
- 25) Srinivasan, V.V., Sivaramakrishnan, V. R., Rangaswamy, C. R., Ananthapadmanavha, H. S. and Shankaranarayana, K. H., *Sandal (Santalum album L.)*, ICFRE, Dehra Dun, 1992.
- 26) Siddhiqi MA. Format for the pharmacopoeial analytical standards of compound formulation, workshop on standardization of Unani drugs, Central Council for Research in Unani Medicine 1995. New Delhi. 1995.
- 27) World Health Organisation. Pharmaceuticals Unit: Quality control methods for medicinal plant materials: 1992: Available <http://www.who.int/iris/handle/10665/63096>
- 28) Banchhor M, Ashawat MS, Saraf S. Herbal cosmetics: Trends in Skin Care Formulation. *Pharmacogn Reviews* 2009; 3(5): 82-89. from:
- 29) Mandeep S, Shalini S, Sukhbir LK, Ram KS, Rajendra J. Preparation and Evaluation of Herbal Cosmetic Cream. *Pharmacologyonline* 2011; 12581264.
- 30) Singh M, Sharma S, Khokra SL, Sahu RK, Jangde R. Preparation and evaluation of herbal cosmetic cream. *Pharmacologyonline.* 2011; 2:1258-64.