



Formulation and Evaluation of Herbal Face Pack

¹Ramakrishna S*, ²Gopikrishna UV ,

¹Assistant professor, Department of Pharmacognosy, Sree Siddaganga College of Pharmacy, Tumakuru.

²Assistant professor, Department of Pharmacognosy, Srinivas College of Pharmacy, Mangalore .

***Corresponding Author: Ramakrishna.S**

Assistant Professor, Department of Pharmacognosy, Sree Siddaganga College of Pharmacy,
Tumakuru, Karnataka, India

Email: ram1976krishnatumkur@gmail.com, Mobile: 7975061914

Abstract:

Everybody wants to get a fair and charming skin. Now a day, acne, black heads, pimples are common among persons who suffer from it. According to Ayurveda, skin problems are normally due to impurity in blood. Herbal face packs are used to simulate blood circulation, rejuvenate the muscles and help to maintain the elasticity of the skin and remove dirt from skin pores. The advantage of herbal cosmetics is their non toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in the present work, an attempt has been made in formulating an ideal face pack suitable for all skin types.

Indexed Term: Herbal face pack, Bael, Ritha, Nutmeg, Evaluation

INTRODUCTION

Since from ancient period of time, people are aware of the use of plants for the healthy, glowing and beautiful skin. Cosmetics are products used to clean, beautify and promote attractive appearance ¹. Cosmetics are commercially available products that are used to improve the appearance of the skin by action of cleansing, beautifying, promoting attractiveness. From the ancient time, different herbs are used for cleaning, beautifying and to manage them. Face skin is the major part of the body, which indicates the health of an individual ². In ancient times women's were very conscious about their beauty and took special care of their specific skin types. Even today, people especially in rural areas and hilly regions go for the natural remedies like plant extracts for various cosmetics purposes like neem, aloe vera, orange peel, tulsi, rose...etc¹. everybody wants to get fair and charming skin. Nowadays, 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 impurity in blood ³.

In Ayurveda, the herbal paste is called as 'mukha lepa' used for as a facial therapy. this herbal paste smeared on face to treat acne, pimple, scars, marks and pigments. Herbal face packs are cheaper and have no side effect for getting fair skin naturally ⁴. Herbal cosmetics are the products which are used to purify and beautify the skin. The main advantage of using herbal cosmetics is that it is pure and does not have any side effects on human body ⁵.

Face pack is the smooth powder which is used for facial application. These preparations are applied on the face in the form of liquid or pastes and allowed to dry and set to form film giving tightening, strengthening and cleansing effect to the skin. They are usually left on the skin for ten to twenty-five minutes to allow all the water to evaporate, the resulting film thus contracts and hardens and can easily be removed. The warmth and tightening effect produced by application of face pack produces the stimulating sensation of a rejuvenated face, while the colloidal and adsorption clays used in these preparations remove the dirt and grease from the skin of the face. When the applied face pack is eventually removed skin debris and deposited dirt gets removed with it ⁶.

MATERIALS AND METHOD

HERBAL INGREDIENTS PROFILE

Cinnamon**Botanical name:** - *Cinnamomum verum***Family:** - *Lauraceae***Genus:** - *Cinnamomum***Active constituents:**

Cinnamon consists of a variety of resinous compounds, including Cinnamaldehyde, Cinnamate, Cinnamic acid, and numerous Essential oils. The spicy taste and fragrance are due to the presence of Cinnamaldehyde and occur due to the absorption of oxygen. As cinnamon ages, it darkens in colour, improving the resinous compounds. various physiochemical properties of cinnamon. The presence of a wide range of essential oils, such as Trans-cinnamaldehyde, Cinnamyl acetate, Eugenol, L-Borneol, Caryophyllene oxide, β -Caryophyllene, L-Bornyl acetate, E-Nerolidol, α -Cubebene, α -Terpineol, Terpinolene, and α -Thujene, has been reported ⁷.

**Uses:-**

- Cinnamon has Antibacterial properties and it helps in treating pimples.
- Cinnamon is a powerful Antioxidant and thus prevents signs of ageing
- It can make skin look plumper and more even-toned
- Cinnamon has Anti-inflammatory properties ⁸.

Orange peel**Botanical name:** - *Citrus sinensis* (sweet orange)*Citrus aurantium* (bitter orange)**Family:** - *Rutaceae***Genus:** - *Citrus***Active constituents:**

Limonene (90%), Citral (4%), Vitamin C, Pectin, Hesperidine, Aurantimaricin, Aurantimaric acid, Octanal (39%), Decanal (42%), Monoterpene (91%) and contains no less than 2.5% Volatile oil ⁹.

Uses:-

- Protects skin from free radical damage.
- Heals dry, flaky, and itchy skin.
- Hydrates dehydrated skin.
- Brings back moisture.
- Prevents oxidative stress in skin cells, for youthful, glowing skin.
- Helps in renewing worn-out cells.
- Works as a skin lightening agent.
- Removes tan.
- Loaded with Anti-ageing properties.
- Promotes healthy skin glow ¹⁰.

Neem**Botanical name:** - *Azadirachta indica***Family:** - *Meliaceae***Genus:** - *Azadirachta***Active constituents:**

The extracted chemical constituents of different parts of neem tree contained many biologically active compounds, including Triterpenoids, Alkaloids, Phenolic compounds, Flavonoids, Carotenoids, Ketones and Steroid. The most biologically active compound is Azadirachtin. This compound belongs to the C-seco Limonoids which was classified as Tetranortriterpenes. It is actually a mixture of seven isomeric compounds labelled as Azadirachtin M and Azadirachtin N, Meliacin, Azadirachtin,



Gedunin, Nimbidin, Nimbolides, Nimbin, Salanin and Valassin. The four best Limonoids compounds were included Azadirachtin, Salannin, Meliantriol, and Nimbin. Limonoids contain insecticidal and pesticidal activity (30) which lead to its role as an Antifeedants, Repellents, Growth inhibitors, Attractants, Chemosterilants or as Insecticides. Nimbin, Salannin, Salannol are some of the Limonoid compounds isolated from *Azadirachta indica*.¹¹.

Uses:-

- A study on hairless mice shows that neem oil is a promising agent to treat aging symptoms like thinning skin, dryness, and wrinkling.
- Neem oil helps in healing process of post-surgical scalp wounds.
- Neem oil has a good prolonged treatment for acne.
- It also has Antifungal and Antibacterial activity
- It reduces scars, heal wounds, minimize warts and moles¹².

Ritha/ Indian soapberry

Botanical name: - *Sapindus mukorossi*

Family: - *Sapindaceae*

Genus: - *Sapindus*

Active constituents:

Hederagenin3-O- α -L-arabinopyra nosyl(2 \rightarrow 1)- α -L-rhamnopyranosyl(3 \rightarrow 1)- β -D-xylopyranosyl(4 \rightarrow 1)glucopyranoside, Hederagenin3-O- α -L-arabinopyra nosyl(2 \rightarrow 1)- α -L-rhamnopyranosyl(3 \rightarrow 1)- β -D-xylopyranosyl,28-arabinopyranosyl(2 \rightarrow 1)- α -L-rhamnopyranosyl(3 \rightarrow 1)xylopyranosyl(4 \rightarrow 1)glucopyranosyl[(6 \rightarrow 1)rhamnopyranosyl](2 \rightarrow 1)glucopyranoside¹³.

Uses:-

- The saponins present in Ritha is an excellent ingredient that has a superb cleansing property, and thus it is used in making soap and face wash.
- The mixture of Ritha and Besan flour prepared in water is applied to all parts of the skin, and it helps improve the skin glow and sustenance.
- Due to the perfect moisturizing property of Ritha, it keeps the skin hydrated and prevents the excessive drying of skin, which further helps make the skin look radiant.
- Ritha fruit has powerful Anti-inflammatory and Antibacterial properties, which help treat skin disorders such as Psoriasis, Acne, and Eczema¹⁴.

Bilva (Bael)

Botanical name: - *Aegle marmelos*

Family: - *Rutaceae*

Genus: - *Aegle*

Active constituents:

Leaves contain Alkaloids, Mermesinin, Rutin, Phenylethyl Cinnamides, Anhydromarmeline, and Aegelinosides Sterols, and Essential oils. Aegelenine, Aegeline, Aegelinosides A, Aegelinosides B, Dictamine, Ethyl cinnamamide, Ethyl cinnamate, Frangine, Halfordinol, Imperatorin, Isoimperatorin, Marmelide, Marmelosin, Marmesin, Marmin, Methyl ether¹⁵.

Uses:-

The Anti-bacterial, Anti-fungal, and Anti-inflammatory property present in Bael is an excellent remedy for skin infections. An oil prepared from Bael leaf is beneficial for skin rash and itchy bumps. Bael leaves is also a blood purifier. It helps to flush all toxins from the body. These fruits are also popular for Antioxidant, Anti-inflammatory and Laxative properties and it has been in use for its medicinal and therapeutic properties in Ayurveda, Siddha and other forms of alternate medicine for thousands of years¹⁶.



Nutmeg**Botanical name:** - *Myristica fragrans***Family:** - *Myristicaceae***Genus:** - *Myristica***Active constituents:**

Nutmeg contains of 5 to 15% Volatile oil, Lignin, Stearin, Starch, Gum, Colouring matter, and 0.08% of an acid substance. The Volatile oil contains Clemicine, Myristicin, Geraniol, Borneol, Pinene, Camphene, and Dipentene. It also contains Eugenol, Safrol, p-Cymene and Isoeugenol in small quantity ¹⁷.

Uses:-

- It reduces pigmentation
- Mildly abrasive nature makes nutmeg a great exfoliator for skin. Hence it makes skin gentle and smooth.
- Treats oily skin
- Nutmeg has Anti-oxidant and Anti-ageing properties. Hence it promotes youthful skin.
- Natural toning cleanser ¹⁸.

METHOD OF PREPARATION**FORMULATION OF HERBAL FACE PACK**

Step 1: All the required herbal powders for the face pack preparation were accurately weighed individually by using digital balance. The quantity and compositions are listed in Table: 1

Table 1:Ingredients for Herbal Face Pack

Sl. No.	Ingredients (in Powder form)	Quantity
1	Cinnamon	5g
2	Orange peel	5g
3	Neem	5g
4	Ritha	5g
5	Bilva	5g
6	Nutmeg	2.48g
7	Rose water	Q.S

Step 2. The herbal drugs such as Cinnamon, Orange peel, Neem, were transferred to mortar and pestle and triturated.

Step 3. Herbal drugs such as Ritha, Bilva & Nutmeg were triturated in a separate mortar and pestle to form a uniform fine mixture..

Step 4. Previously prepared mixture of herbal powders was transferred to the mixture of fine powders and triturated to obtain uniform drug powder of face pack.

Step 5. The powders were passed through sieve no #44

Step 6. The prepared face pack powder was packed into a self-sealable polyethylene bag, labelled and used for further studies.

Procedure of face pack application

Take prepared face pack powder in a bowl as per the requirement and add rose water. Mix well to form a paste with optimum thickness. It should be applied evenly on the face with the help of a brush. Cover the acne and blemishes spots. Keep as it is for complete dryness for 20-25 minutes. Then it should be washed with cold water.

METHOD OF EVALUATION

ORGANOLEPTIC EVALUATION: The organoleptic parameters include its appearance, color, odor, texture, grittiness, washability, which were evaluated manually for its physical properties. ¹

PHYSICOCHEMICAL EVALUATION: Physicochemical parameters were determined, including the determination of moisture content, extractive values, pH and ash values. ⁵

Determination of moisture content: Moisture content is important for the plant drugs because insufficient drying may lead to possible enzymatic deterioration of the active principles. • Moisture content was determined by loss on drying (LOD).

Weigh accurately 3gms of the powder drug and take in a weighed petri dish and placed in hot air oven at 100-108°C. It was weighed until constant weight was obtained. ⁶

Determination of extractive values: Extractive values are primarily useful for the determination of exhausted or adulterated drugs. It helps to determine the quality as well purity of the product. It also gives an idea about the nature of the chemical constituent's

Less extractive value indicates addition of exhausted material, adulteration or incorrect processing during drying or storage or formulating.

Water soluble extractive value: Macerate about 5gm of accurately weighed sample with 100ml chloroform water in a stoppered flask for 24 hours. Shake frequently for first 6 hours. Filter rapidly through filter paper into a 50ml cylinder and evaporate 25ml aqueous extract to dryness in a tared flat-bottomed shallow dish. Evaporate to dryness on a water bath and completely dry the residue in an oven at 105° and weigh. Keep it in a desiccator. Dry the extract to constant weight, finally calculate the percent w/w of water-soluble extractive value with reference to the air-dried drug.

Alcohol soluble extractive value: Macerate about 5gm accurately weighed sample with 100ml 90% alcohol in a 100ml stoppered flask for 24 hours. Shake frequently for first 6 hours. Filter rapidly through filter paper into 50ml cylinder and collect the filtrate and evaporate 25ml of alcoholic extract to dryness in a tared flat-bottomed shallow dish.

Evaporate to dryness on a water bath and completely dry the residue at 105° and weigh. Keep it in a desiccator. Dry the extract to constant weight, finally calculate the percent w/w of alcohol soluble extractive value with reference to the air-dried drug.

Determination of pH: It is the measurement of acidity or alkalinity of the product measured on a scale of 0-14. pH of formulated face pack in rose water was found.

Determination of Ash values: The residue remaining after complete incineration is the ash content of the product. Ash value is a criterion to judge the identity or purity of the drug. A high ash value is indicative of contamination, substitution, adulteration or carelessness in preparation of the product. Ash values can be determined by as follows:

Total Ash value: Total ash value is useful for detecting low grade, exhausted products and also useful for detecting excess of sandy, earthy matter with drug. About 2-4gm of the prepared sample was placed in a previously ignited and tared crucible. The material was spread evenly on the crucible and ignited by gradually increasing the heat until it was white i.e. free from carbon. It was then cooled in desiccator and weighed. Percentage total ash was calculated with reference to the air-dried sample.

Acid insoluble Ash value: Used to determine the earthy matter.

To the crucible containing total ash, 25ml of HCl was added and covered with a watch glass. Boiled gently for 5min. The watch glass was rinsed with 5ml hot water and added into the crucible. The insoluble matter was collected on an ashless filter paper and washed with hot water until it was neutral. The filter paper containing the insoluble matter was transferred to the original crucible, dried on a hot plate and ignited to constant weight. Allowed to cool in a desiccator for 30min and weighed. Percentage acid insoluble ash was calculated in reference to air-dried sample.

Water soluble ash value: It is the difference in weight between total ash and residue after treatment of total ash with water. It is used to detect either the material is exhausted by water or not. To the crucible containing total ash, 25ml water was added and boiled for 5min. The insoluble matter was collected on an ashless filter paper. Washed with hot water and ignited in a crucible for 15min at a temperature not exceeding 450°C. Cooled and weighed. Percentage water soluble ash was calculated in reference to air dried sample.

RHEOLOGICAL EVALUATION: It gives an overall idea about the visco elastic flow behavior of the product. Physical parameters like angle of repose, tapped density, bulk density, Hausner's ratio and Carr's index were observed and calculated for the formulation.

Angle of repose: The angle of repose or critical angle of repose, of a granular material is the steepest angle of descent or dip relative to the horizontal plane to which a material can be piled without stumping. It is important for the design of processing, storage and conveying systems of particulate materials. It is also useful to quantify the flow properties of powder because it influences cohesion among the different particles. The fixed funnel cone method

employs the calculation of height (H) above a paper that is placed on a horizontal surface. The formulated pack was carefully poured through the funnel till the peak of the conical heap just touched the tip of the funnel. Here 'R' denotes the radius of the conical heap.

The equation for calculating angle of repose(α) is,

$$\alpha = \tan^{-1} \frac{H}{R}$$

Tapped Density: The tapped density is an increased bulk density attained after mechanically tapping a graduated measuring cylinder containing powder sample. The tap density of a powder can be used to predict both flow properties and its compressibility. The volume of packaging can be determined in a graduated cylinder. 25gms of weighed formulation powder was taken and slowly added to the cylinder with the aid of a funnel. The initial volume was observed firstly and the sample was then tapped until no further volume reduction occurred.

The value obtained after tapping was noted. The equation for calculating the tapped density is, **Tapped density = Weight of (g) Tapped volume (ml)**

Bulk Density: The bulk density value includes the volume of all the pores within the powder sample. The term bulk density refers to method used to indicate a packaging of particles or granules. 25gms of weighed powder was taken and slowly poured into the graduated cylinder. The volume occupied by the powder was noted. The formula for calculating bulk density is,

$$D = MV$$

Where, D = bulk density, M = mass of particles, V = total volume occupied by them.

Hausner's Ratio: Hausner's ratio is related to interparticle friction and as such can be used to predict the powder flow properties.

The equation for measuring the Hausner's ratio is,

$$\text{Hausner's ratio} = \frac{\text{tapped density}}{\text{bulk density}}$$

Carr's Index: Carr's index is another indirect method of measuring the powder flow from bulk density. It is directly related to the relative flow rate cohesiveness and particle size. It is simple, fast and popular method of presiding powder flow characters.

The equation for measuring it is,

$$\% \text{ compressibility} = \frac{\text{tapped density} - \text{bulk density}}{\text{tapped density}} \times 100$$

Particle size: Particle size is a parameter, which affect various properties like spreadability, grittiness, etc. Particle size was determined by microscopy method according to the standard procedure.

RESULT AND DISCUSSION

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

Organoleptic evaluation

Herbal face pack was evaluated for organoleptic parameters showed in the **Table 2**. The colour of prepared formulation was brown. The odour of prepared formulation was pleasant and good acceptable which is desirable to cosmetic formulations.

Table 2: Organoleptic Evaluation

Sl. No.	Parameter	Observation
1	Colour	Brown
2	Odour	Pleasant
3	Appearance	Smooth, fine
4	Texture	Fine
5	Smoothness	Smooth

Herbal face pack was evaluated for powder property. showed in **Table 3**. Rheological findings justified the flow properties of herbal face pack. It was found to be free flowing and non- sticky in nature

Table 3: Rheological Evaluation

Sl. No.	Parameter	Observation
1	Bulk density	0.35g/ml
2	Tapped density	0.40g/ml
3	Angle of repose	20.1
4	Hausner's ratio	1.33
5	Carr's index	17.4%
6	Particle size	54.87

Observation: Rheological findings justified the flow properties of the face pack as it was found to be free flowing and non-sticky in nature. The results proved that the formulation was stable in all aspects.

Physiochemical evaluation

Herbal face pack was evaluated for physiochemical parameters showed in **Table 4**. The pH of the formulation was found to be 6.. The moisture content was within limit.

Table 4: Physiochemical evaluation

Sl. No.	Parameter	Observation
1	pH	6
2	Moisture content	11.34%
3	Water soluble extractive value	16%
4	Alcohol soluble	13.6%

	extractive value	
5	Total ash value	2.066%
6	Acid insoluble ash value	0.925%
7	Water soluble ash value	1.48%

Observation: Moisture content value clearly indicated that the formulation was hygroscopic in nature. Extractive values and ash values were found within the limits. pH was found neutral to suit the requirements of all skin types.

Irritancy test

The prepared herbal face was subjected for irritancy test and the results are showed in **Table 5**. The herbal face pack formulation doesn't showed any sign of irritation, redness and swelling during irritancy studies.

Table 5: Irritancy test

Sl. No.	Parameter	Observation
1	Irritation	Nil
2	Redness	Nil
3	Swelling	Nil
4	Photo irritation	No irritation, No swelling, No redness

Observation: Irritancy test showed negative results for irritancy, redness, swelling and photo irritancy, as the herbals in their natural form without addition of chemicals were found to be compatible with the skin proteins.

Stability studies

The prepared herbal face pack was subjected for stability studies and the results are showed in **Table 6**. No change in colour, odour, texture, smoothness and pH was observed.

Table 6: Stability testing

Sl. No.	Parameter	Room temperature	40°
1	Colour	No change	No change
2	Odour	No change	No change
3	Texture	Fine	Fine
4	Smoothness	Smooth	Smooth
5	pH	6	6

Observation: Stability tests performed at different temperatures over a period of one month revealed the inert nature of the face pack in the terms of color, odor, appearance, texture and pH.

Conclusion:

The dried powders of combined pack showed good flow property which is suitable for a face pack. Organoleptic evaluation showed that the pack is smooth & pleasant odour. Rheological findings justified the flow properties of the pack as it was found to be free flowing & non sticky in nature. Formulation was stable on all aspects, with no Irritancy. Stability tests revealed the inert nature of the pack. Further optimisation studies are required on its various parameters to find its useful benefits on the human beings.

BIBLIOGRAPHY

1. Rashmi Saxena Pal, Yogendra Pal and Pranay Wal. In-House Preparation and Standardization of Herbal Face Pack. *The Open Dermatology Journal*. 2017;11; 72-80.
2. Swati Siddheshwar Londhe, Mangesh Gautam Bhosale and Amol Arun Joshi. Formulation and Evaluation of Polyherbal Face Pack. *World Journal of Pharmaceutical and Medical Research*. 2020;6(7); 159-165.
3. Seema Yuvraj Mendhekar, Pratiksha Sukhadev Sonawane, Rupali Bajirao Kale, Jadhav S.L. And Gaikwad D.D. Formulation and Evaluation of Polyherbal Face Pack. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2017;6(12); 1378-1387.
4. Sachin Bhagwat Aglawe, Amol Uttamrao Gayke, Suraj Anil Mindhe, Varsha Gajanan Rane. Formulation and Evaluation of Herbal Face Pack. *International Journal of Pharmacy and Biological Sciences*. 2018;8(4); 49-52.
5. Avinash O Maske, Manisha Pandhare, Ashwin D Wanjari. Formulation and Evaluation of Herbal Face Pack for Glowing Skin. *International Journal of Advances in Pharmaceutics*. 2019;8(1); 1-5.

6. Sachin B Somwanshi, Kiran S Kudale, Ramdas T Dolas, Kiran S Kotade. Formulation and Evaluation of Cosmetic Herbal Face Pack For Glowing Skin. *International Journal of Research in Ayurveda and Pharmacy*. 2017;8(3); 199-203.
7. Pasupuleti Visweswara Rao, Siew Hua Gan. Cinnamon A Multifaceted Medicinal Plant. *Evid Based Complement Alternat Med*. Published online 2014 Apr 10.
8. Skin Benefits of Cinnamon/Dalchini. Published online on 3 July 2020. <https://www.healthshots.com/beauty/natural-cures/4-skin-benefits-of-cinnamon-or-dalchini-that-are-just-amazing/>
9. Orange Peel Biological Sources, Morphological Features, Chemical Constituents and Uses. November 03, 2020. www.gpatindia.com
10. 5 ways you can use orange peels to get glowing skin. Updated on March 02, 2021. www.timesnownews.com
11. Ahmad Eid, Nidal Jaradat, Nagib Elmarzugi. A Review of Chemical Constituents and Traditional Usage of Neem Plant. *Palestinian Medical and Pharmaceutical Journal*. 2017; 2(2): 75-81.
12. Use of Neem oil for skin care. Medically reviewed by Cynthia Cobb, DNP, APRN, WHNP-BC, FAANP — Written by Kitty Jay — Updated on May 15, 2019. www.healthline.com
13. A. Sharma, S.C. Sati, O.P. Sati, D. Maneesha. Chemical Constituents And Bio Activities of Genus *Sapindus*. *International Journal of research in Ayurveda and Pharmacy*. February 2011; 2(2); 403-409.
14. Reetha Uses, Benefits, Side Effects And Dosage. <https://pharmeasy.in/blog/reetha-uses-benefits-side-effects-dosage/>
15. Chamila Kumari Pathirana, Terrence Madhujith, Janakie Eeswara, Bael(Aegle marmelos L. Corrêa), Medicinal Tree with Immense Economic Potentials. *Advances in Agriculture*, vol. 2020, Article ID 8814018, 13 pages, 2020. <https://doi.org/10.1155/2020/8814018>
16. Bael: Medicinal Uses, Therapeutic Benefits For Skin, Diabetes And Supplements. Updated on January 24, 2021. www.netmeds.com
17. Nutmeg. Pharmacognosy and Phytochemistry. Drugs containing Volatile oils. <http://www.pharmacy180.com/article/nutmeg-249/>
18. Nutmeg For Skin: How To Use The Wonder Spice In Beauty Regime. Updated on November 06, 2020. www.food.ndtv.com

