



DEVELOPMENT OF PIGMENTATION REDUCING SHEET MASK USING HERBAL EXTRACTS

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1. ABSTRACT:

A skin condition known as "hyperpigmentation" results in darker or more discolored skin. This is due to the surplus production of melanin. There might be several reasons behind this. Treatments for hyperpigmentation have an immediate impact. The formation of melanin in our skin can be reduced by applying a range of natural substances that are safe for our skin. Additionally, the skin should need to be cooled and moisturized for this. Herbs, including liquorice, vetiver, musk turmeric, aloe vera, and citric bio-enzyme, could be used to cure hyperpigmentation. These nutrients are made of natural ingredients that are cooling, help cure pigmentation, and add moisture to the skin. The citric bio-enzyme will significantly brighten the skin.

Key words: hyperpigmentation, skin discoloration, melanin, hydration, coolness, liquorice, khus, wild turmeric, aloe vera, citric bio-enzyme, natural components, lighten skin.

2. INTRODUCTION:

Hyperpigmentation is a skin disorder causing skin to become darker due to excessive melanin production. Treatments include oral medicines and topical creams. However, chemical-based treatments are not appealing to everyone. A chemical-free lifestyle is becoming popular, leading to the development of natural products like sheet masks. These masks contain ingredients like liquiritin, flavonoids, glabridin, phenolic acid, gallic acid, curcumin, antioxidants, and citric acid, which can decrease melanin production and provide moisture.

3. OBJECTIVES:

- To develop pigmentation-reducing sheet masks with natural substances.
- To obtain the extract from the raw materials. (*Glycyrrhiza glabra*, *Aloe vera*, *Azadirachta indica*, *Curcuma aromatica*, *Chrysopogon zizanioides*)
- To reduce the pigmentation with natural ingredients.

- To develop an eco-friendly sheet mask without causing pollution.
- To analyse the use of a sheet mask.

4. METHODOLOGY:

4.1. SELECTION OF FABRIC:

4.1.1. COTTON SPUNLACE NON-WOVEN FABRIC:

Cotton spun lace, or water jet interlaced nonwoven fabric, is a safe, nonwoven fabric made from cotton fibers, used in various applications such as wipes, surgical fabrics, gauze, wound dressings, baby diapers, and sheet masks.

CHARACTERISTICS OF COTTON SPUNLACE:

Because of flexible tangling, the fiber keeps its natural characteristics and has a feel similar to conventional textiles. It can be draped, absorbs moisture quickly, and has high air permeability. It is modifiable and washable. Modern machinery and excellent water quality are necessary for production.

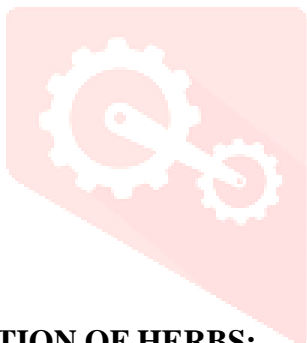


Fig.no:1 Spun lace fabric

4.2. SELECTION OF HERBS:

4.2.1. GLYCYRRHIZA GLABRA:

Glycyrrhiza Glabra roots are used to make licorice extract. In India, it is widely farmed. By dispersing melanin, preventing melanin manufacture, and inhibiting cyclooxygenase activity, licorice extract reduces hyperpigmentation by reducing the generation of free radicals, which are mostly made up of glabridin. The primary component of licorice extract is the polyphenolic flavonoid called glaciridin.



Fig.no:2 Licorice powder

Preparation of *Glycyrrhiza glabra* powder:

To make licorice powder, wash the roots thoroughly, slice them, air-dry in the sun, grind into a fine powder, dry it with air to remove excess moisture, sieve it, and store it in airtight containers in a cool area for later use.

4.2.2. ALOE VERA:

Aloe vera, sometimes referred to as "the plant of immortality" in Egyptian culture, has long been utilized for cosmetics, skincare, and therapeutic uses. *Aloe vera* plants contain two chemicals called aloin and aloesin, which have been shown to lighten skin pigmentation. It has been demonstrated that aloin degrades melanin in the skin, whereas aloesin prevents melanin from developing by blocking the activity of tyrosinase, the enzyme that makes melanin.



Fig.no:3 *Aloe vera* powder

Preparation of *Aloe vera* powder:

Wash chopped leaves, let yellow latex fall off, trim edges, slice thinly, dry completely for a week, use an oven or dehydrator, pulverize into a fine powder, sieve, and store in sealed containers in a cool location for later use.

4.2.3. AZADIRACHTA INDICA:

A mahogany tree native to Southeast Asia and the Indian subcontinent, *Azadirachta indica* is also known by the name's Indian lilac, nim tree, margosa, or neem. It is grown all over the world for its oil. Neem naturally cleanses the skin of pigmentation, blemishes, and dark spots from the sun while also aiding in blood purification. Acne scars and black patches can be lessened by using neem oil topically, chewing neem leaves in the morning, and bathing in neem water.



Fig.no:4 Neem powder

Preparation of *Azadirachta indica* powder:

Neem powder is made by gathering organic neem leaves, washing them under running water, patting them dry, and then putting them in a baking pan. After letting them air dry for a few days in the shade, crush them into a fine powder. Via a sieve, strain the powder. Neem powder should be kept dry and cold, out of direct sunlight, in an airtight container.

4.2.4. CURCUMA AROMATICA:

There are 80 species in the *Zingiberaceae* family, and one of them is *Curcuma aromatica*, which grows quickly during summer monsoons and flowers in early spring. Dark spots and other forms of hyperpigmentation are caused by the pigment melanin, which is inhibited by turmeric. A lotion containing turmeric can help these imperfections gradually disappear with continued usage, giving skin a more uniform tone.



Fig.no:5 Wild turmeric

Preparation of *Curcuma aromatica* powder:

To create turmeric powder at home, clean the root, cut off any long roots or leaves, and place fingers and bulbs in a pan. Cover with leaves and let dry for a day. Rhizomes must be boiled and cut into pieces for drying. The finished product should have a moisture level of 5-10% and take 10-15 days to dry in the sun. After grinding, strain and re-grind the larger particles. Store it in a cool place.

4.2.5. CHRYSOPOGON ZIZANIOIDES:

In some regions, *Chrysopogon zizanioides*, also referred to as khus, is a perennial grass belonging to the *Poaceae* family that is used to produce scents. Strong antioxidants and other health benefits of vetiver include its capacity to soothe, detoxify, rebalance, and enhance skin hydration. When used regularly, this very moisturizing spray helps lessen the look of scars and discoloration on the skin.



Fig.no:6 Khus powder

Preparation of *Chrysopogon zizanioides* powder:

To make khus plant powder, wash the root, pat dry the excess water, dry it in the shade, and avoid direct sunlight. Pulverize the dried roots with a high-speed mixer grinder, sieve the powder multiple times, and store it in a sealed container.

4.3. SELECTION OF ENZYME:

4.3.1. CITRIC BIO ENZYME:

Citrus bioenzyme, derived from citrus fruits, contains health benefits due to their high carotenoids, dietary fiber, essential oils, vitamins, and minerals. Citric bioenzyme can help reduce pigmentation by exfoliating dead skin cells and promoting skin renewal. It contains natural acids that can lighten dark spots and even out skin tone.



Fig.no:7 Citric bio-enzyme

4.3.2. PROCESS OF MAKING CITRIC BIO ENZYME:

- Firstly, gather the peels and waste from the citrus fruits . Afterwards, take out all the seeds from the waste.
- The second primary component needed to make enzyme is palm sugar, brown sugar, or jaggery. The crucial aspect here is that there should be no additives or preservatives of any type in the jaggery. It ought to be produced organically.
- Only jaggery and palm sugar is added. white sugar is not added in this.
- The ratio used to make this is 15:10:3:1. That means the container used to make the bioenzyme should use fifteen times as much water.
- Ten parts water, three parts citrus waste and peels from the kitchen, and one part jaggery should all be added to the container.
- Drinking water is added. Distilled water us not added.
- Put the airtight lid on the container now.
- This mixture will now be treated for ninety days.
- Every day for the first thirty days, we should open the container and let the generated gas go.
- The container is not opened for ninety days. After ninety days, the citrus waste settled at the bottom, and a white layer formed on top.
- The white layer on the top indicates that the bio enzyme is ready to use.
- The bio-enzyme can be used after 90 days.

4.4. SELECTION OF CHEMICAL:

4.4.1. ETHANOL:

Ethanol, a byproduct of plant fermentation, is used in medicine, as an antiseptic and disinfectant, as an alternative fuel source, and as a chemical solvent. It is also used in lotions, cosmetics, beauty products, and gasoline to maintain driveability and prevent engine knocking.



Fig.no:8 Ethanol

4.5. METHOD OF FINISHING:

- Gather all the herbs required for the project, including khus, licorice, *aloe vera*, neem, and wild turmeric.
- Separately, grind all the herbs into a fine powder.
- Combine all of the herb powder with the ethanol in a 4:2:1:1:2 ratio.
- After that, let it sit in the ethanol to draw out the herbal essence.
- After that, strain the powder out of the ethanol mixture.
- In a 2:1 ratio, add the citric bio-enzyme to the ethanol solution.
- Next, take a rectangular piece of nonwoven spun lace fabric and dip it into the ethanol and citric bio-enzyme mixture.
- After taking the cloth out of the solution, store it within the airtight cover.



Fig.no:9 Adding herbal extract
the fabric in the



Fig.no:10 Adding citric bio-enzyme



Fig.no:11 Soaking

Fig.no:12 Packing in the to the herbal extract mixed solution zip lock cover

5. RESULTS AND DISCUSSION:

5.1. ANTIMICROBIAL TEST:

PREPARATION OF THE BACTERIAL INOCULUM

Stock cultures were maintained at 4° C on slopes of nutrient agar and potato dextrose agar. Active culture for experiments were prepared by transferring a loop full of cells from stock cultures to test tubes of 50ml nutrient broth bacterial cultures were incubated with agitation for 24hours and at 37°c on shaking incubator and fungal cultures were incubated at 27°c for 3-5 days. Each suspension of test organism was subsequently stroke out on nutrient agar media and potato dextrose agar. Bacterial cultures then incubated at 37°c for 24 hours and fungal incubated at 27°c for 3-5 days. A single colony was transferred to nutrient agar media slants were incubated at 37°c for 24 hours and potato dextrose slant were incubated at 27°c for 3-5 days. These stock cultures were kept at 4°c. For use in experiments, a loop of each test organism was transferred into 50ml nutrient broth and incubated separately at 37°c for 18-20 hours for bacterial culture.

Well Diffusion method

The antibacterial activity and antifungal activity of crude extract extracts was determined by Well Diffusion method (Bauer *et al.*, 1996). MHA plates were prepared by pouring 20ml of molten media into sterile petriplates. After solidification of media, 20-25µl suspension of bacterial inoculums was swabbed uniformly. The sterile paper discs were dipped into required solvents then placed in agar plates. Then 10-50 µl of plant extract was poured into the wells. After that, the plates were incubated at 37°C for 24 hours. Assay was carried

into triplicates and control plates were also maintained. Zone of inhibition was measured from the edge of the well to the zone in mm. The tested cell suspension was spread on mullerhintonagar plate and potato dextrose agar. well were put into the agar medium using sterile forceps. plant extract were poured on to wells. Then plates were incubated at 37°C for about 24 hours and control was also maintained. Zone of inhibition was measured from the clear zone in mm.

Antibacterial activity was performed by agar diffusion method. Van der Watt *et al.*, 2001. The stock culture of bacteria (*E. coli*, *S. aureus* and *Candida albicans*) were received by inoculating in nutrient broth media and grown at 37 °C for 18 hours. The agar plates of the above media were prepared. Each plate was inoculated with 18 hours old cultures the bacteria were swab in the sterile plates. Placed the extract treated cloth and untreated cloths were placed. All the plates were incubated at 37°C for 24 hours and the diameter of inhibition zone was noted in Cm.

Agar well diffusion method has been used to determine the antimicrobial activities and minimum inhibitory concentrations or plant extracts against Gram-positive, Gram-negative bacteria. The extracts exhibited antibacterial activities against tested microorganisms.

Organisms	<i>E. coli</i>	<i>S. aureus</i>	<i>Candida albicans</i>
Herbal extract	1.4 cm	1.2 cm	1.0 cm
Standard (Bacteria- Chloramphenicol) Fugues- Fluconazole	1.5 cm	1.5 cm	1.5 cm



Fig.no:13 E.Coli



Fig.no:14 S. aureus



Fig.no:15 Candida albicans

Anti-microbial Report:

The result find extract having antimicrobial activity against the *E. coli*, *S. aureus* and *Candida albicans*. The result shows the given Herbal extract heaving Anti-microbial activity.

5.2. LIQUID ABSORPTIVE CAPACITY TEST:

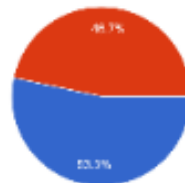
5.3. QUANTITATIVE ANALYSIS:

PIGMENTATION REDUCING SHEET MASK SURVEY REPORT

1. Do you know about sheet mask.
45 responses



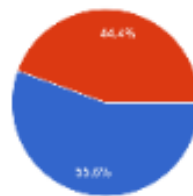
2. Have you ever used sheet mask?
45 responses



3. Does sheet mask reduce pigmentation.
45 responses



4. Have you tried any other methods for reducing pigmentation?
45 responses



5. Which type of sheet mask do you prefer?
45 responses



6. Do you think sheet masks are Eco-friendly.
45 responses



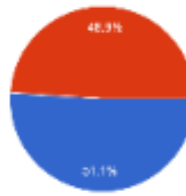
LIQUID ABSORPTIVE CAPACITY.**	P2300527-1
In-house Method	Described by the Customer : Non-Woven Fabric
Percentage	1217.47

7. How often do you use sheet mask?
40 responses



● Weekly once
● Weekly twice
● Monthly once

8. Have you tried pigmentation reducing sheet mask?
40 responses



● Yes
● No

9. Do you think pigmentation can be fully removed.
46 responses



● Yes
● No

10. Would you suggest pigmentation reducing sheet mask to others?
44 responses



● Yes
● No

6. SUMMARY AND CONCLUSION:

The project aims to create a sheet mask for skin pigmentation reduction, using a unique combination of substances. The mask is designed for ease of use and noticeable results. The project aims to help people overcome pigmentation anxieties and boost self-esteem, but further testing and improvement are needed for its efficacy and security.



Fig.no:16 Final product

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