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Formulation and Evaluation of De- Tanning Soap & Skin Smoothening Soap

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ABSTRACT:

Excessive sun exposure often leads to skin tanning, characterized by the darkening of the skin due to increased melanin production. This study investigates the formulation and efficacy of a de-tanning soap developed using natural ingredients known for their skin-lightening and exfoliating properties. Key components include kojic acid, licorice extract, turmeric, papaya enzyme, and aloe vera, all of which are reputed for their ability to reduce pigmentation and promote skin renewal. The soap was evaluated for its physicochemical properties, safety, and effectiveness through in vitro tests and a controlled trial involving human volunteers. Results showed a visible reduction in skin pigmentation over a four-week period, improved skin texture, and minimal adverse reactions. The findings suggest that regular use of the de-tanning soap can aid in reversing mild to moderate tanning, offering a natural and affordable skincare solution.

KEYWORDS: Papaya extract, sandalwood powder, turmeric powder, almond oil, tea oil, palm oil, olive oil, coconut oil, Shea butter, orange peel powder, aloevera gel, licorice powder , castor oil

PAPAYA EXTRACT:

Papaya extract is a natural substance made from the fruit of the papaya plant. It contains an enzyme called papain, which helps remove dead skin cells, making the skin look brighter and smoother. It is often used in skincare products like soaps and creams to lighten dark spots, reduce tanning, and improve overall skin tone. Papaya extract is also rich in vitamins A, C, and E, which help keep the skin healthy and glowing.

SANDALWOOD POWDER:

Sandalwood powder is made from the wood of the sandalwood tree. It has a pleasant, natural fragrance and is known for its cooling and soothing effects on the skin. In skincare, sandalwood powder is used to reduce tanning, lighten dark spots, and calm irritated or inflamed skin. It also helps control excess oil and makes the skin feel fresh and smooth. Because of these benefits, it's commonly used in face packs, soaps, and creams.

ORANGE PEEL POWDER:

Orange peel powder is made by drying and grinding the outer skin of oranges. It is rich in vitamin C and antioxidants, which help brighten the skin and reduce dark spots and blemishes. The natural acids in orange peel gently exfoliate the skin, removing dead cells and excess oil. It also helps tighten pores and gives the skin a fresh, glowing look. That's why orange peel powder is often used in face masks, scrubs, and soaps.

LICORICE POWDER:

Licorice powder is made from the root of the licorice plant. It is well known in skincare for its ability to lighten dark spots, reduce pigmentation, and brighten the skin. It contains a natural compound called glabridin, which helps block the production of melanin (the pigment that causes tanning and dark patches). Licorice powder also has anti-inflammatory and soothing properties, making it useful for sensitive or irritated skin.

TURMERIC POWDER:

Turmeric powder is made from the dried root of the turmeric plant and is well known for its powerful anti-inflammatory and antibacterial properties. In skincare, it helps reduce acne, blemishes, and dark spots, while also giving the skin a natural glow. Turmeric is also effective in reducing tanning and evening out the skin tone, which makes it a common ingredient in face packs, soaps, and creams.

SHEA BUTTER:

Shea butter is a creamy, fat-rich substance extracted from the nuts of the shea tree. It is deeply moisturizing and helps soften and smooth the skin. Rich in vitamins A and E, shea butter nourishes the skin, helps reduce dryness, and supports healing of minor cuts, sunburns, and inflammation. It also forms a protective layer that locks in moisture, making it ideal for use in soaps, lotions, and creams.

ALOEVERA GEL:

Aloe vera gel is a clear, jelly-like substance found inside the leaves of the aloe vera plant. It is well known for its cooling, soothing, and healing properties. In skincare, aloe vera gel helps reduce sunburn, treat acne, and moisturize the skin without making it greasy. It also contains vitamins and antioxidants that help improve skin texture and promote healing, making it a popular ingredient in soaps, creams, and face gels.

OLIVE OIL:

Olive oil is a natural oil extracted from olives, known for its rich content of antioxidants and healthy fats. It deeply moisturizes the skin, helping to keep it soft and smooth. Olive oil also has anti-inflammatory properties that can soothe irritated skin and protect it from damage caused by free radicals. Because of these benefits, it's often used in skincare products like soaps and lotions to nourish and improve skin health.

COCONUT OIL:

Coconut oil is a natural oil extracted from the meat of coconuts. It is known for its excellent moisturizing and antibacterial properties. Coconut oil helps keep the skin soft, smooth, and hydrated while protecting it from harmful bacteria. It can also help reduce inflammation and soothe dry or irritated skin. Because of these benefits, coconut oil is widely used in soaps, lotions, and hair care products.

TREE OIL:

Tea oil, also known as tea tree oil, is a natural oil extracted from the leaves of the tea tree plant. It has strong antibacterial, antifungal, and anti-inflammatory properties. Tea oil helps fight acne-causing bacteria, reduce redness, and soothe irritated skin. It also helps in healing minor cuts and preventing infections. Because of these benefits, tea oil is commonly added to soaps and skincare products to keep the skin clean and healthy.

CASTOR OIL:

Castor oil is a thick, natural oil extracted from castor beans. It is well known for its moisturizing and healing properties. Castor oil helps keep the skin soft and smooth by locking in moisture. It also has anti-inflammatory effects that can soothe irritated or dry skin. Additionally, castor oil supports skin repair and can help reduce blemishes. Because of these benefits, it's often used in soaps, creams, and other skincare products.

ALMOND OIL:

Almond oil is a light, natural oil extracted from almonds. It is rich in vitamins E and A, which help nourish and soften the skin. Almond oil moisturizes dry skin, reduces irritation, and improves skin tone. It also has gentle anti-inflammatory properties and can help reduce dark circles and puffiness around the eyes. Because it absorbs easily, almond oil is widely used in skincare products like soaps, lotions, and massage oils.

Lab-Scale Formula for De-Tanning Soap (100 g batch)

Ingredient	Function	Quantity (grams)
Coconut oil	Cleansing, lather	20 g
Olive oil	Moisturizing, nourishing	15 g
Palm oil	Hardness, creamy lather	15 g
Almond oil	Skin softening	10 g
Castor oil	Lather stabilizer	5 g
Shea butter	Moisturizing, soothing	10 g
Tea tree oil	Antibacterial, acne control	2g
Papaya extract	Exfoliation, de-tanning	5 g
Aloe vera gel	Soothing, hydrating	5 g
Sandalwood powder	Cooling, brightening	2 g
Turmeric powder	Anti-inflammatory, glow	1 g
Orange peel powder	Brightening, exfoliation	2 g
Licorice powder	Skin lightening	1.5 g
Sodium hydroxide (lye)	Saponification agent	~13.5 g
Distilled water	Lye solution	~25-30 g

LAB SCALE TRIAL :

Lab-Scale Trial Procedure for De-Tanning Soap

Objective:

To prepare and evaluate a herbal de-tanning soap using natural ingredients.

Materials:

Papaya extract

Sandalwood powder

Turmeric powder

Almond oil

Tea oil (tea tree oil)

Palm oil

Olive oil

Coconut oil

Shea butter

Orange peel powder

Aloe vera gel

Licorice powder

Castor oil

Lye (sodium hydroxide)

Distilled water

Mixing equipment (stainless steel pots, spatulas, molds, thermometer)

Procedure:

1. Preparation of Oils and Butters:

Measure and mix palm oil, olive oil, coconut oil, almond oil, castor oil, tea oil, and shea butter in a stainless steel pot.

Heat gently (40-50°C) until all solid fats melt and blend well.

2. Preparation of Lye Solution:

Carefully add lye (sodium hydroxide) to distilled water (never the other way around) and stir until fully dissolved.

Allow the lye solution to cool to about 40°C.

3. Mixing Oils and Lye Solution:

Slowly add the cooled lye solution to the melted oils while stirring continuously.

Mix until “trace” is reached (the mixture thickens to a pudding-like consistency).

4. Adding Herbal Ingredients:

Add papaya extract, sandalwood powder, turmeric powder, orange peel powder, licorice powder, and aloe vera gel to the soap mixture.

Stir gently but thoroughly to distribute ingredients evenly.

5. Pouring and Molding:

Pour the soap mixture into molds.

Cover and let it set for 24-48 hours at room temperature.

6. Curing:

Remove soap from molds and cure in a dry, ventilated place for 4-6 weeks to complete saponification and harden the soap.

Evaluation:

Physical properties: Check color, texture, hardness, and fragrance.

pH test: Use pH paper or meter to ensure safe skin pH (around 7-9).

Foaming ability: Test the lathering capability.

Efficacy test: Conduct a small-scale skin test for de-tanning effect over 3-4 weeks with volunteers or using in vitro methods.

Stability test: Observe the soap for any changes during storage.

2 TRAIL:

Lab-Scale Trial 2 Procedure for De-Tanning Soap

Objective:

To optimize the formulation by adjusting ingredient concentrations and evaluate the impact on soap quality and de-tanning effectiveness compared to Trial 1.

Modifications from Trial 1:

Increase papaya extract concentration by 20% to enhance exfoliating action.

Reduce turmeric powder slightly to minimize skin irritation risk.

Add a small amount (1-2%) of extra aloe vera gel for improved skin soothing.

Adjust oil ratios: increase almond oil and olive oil by 10% each for better moisturizing.

Maintain all other ingredients and process conditions the same.

Procedure:

1. Preparation of Oils and Butters:

Heat and blend palm oil, olive oil, coconut oil, almond oil (increased), castor oil, tea oil, and shea butter as before, with adjusted proportions.

2. Preparation of Lye Solution:

Prepare and cool lye solution as in Trial 1.

3. Mixing Oils and Lye:

Combine and mix until trace is achieved.

4. Adding Herbal Ingredients:

Add increased papaya extract, reduced turmeric powder, sandalwood powder, orange peel powder, licorice powder, and increased aloe vera gel. Mix thoroughly.

5. Pouring and Molding:

Pour into molds and set for 24-48 hours.

6. Curing:

Cure soap for 4-6 weeks as before.

Evaluation:

Assess physical properties (color, texture, hardness, fragrance).

Measure pH and foaming ability.

Conduct a skin trial for 4 weeks, comparing with Trial 1’s results on tanning reduction and skin feel.

Stability testing for 6 weeks.

Expected Outcomes:

Enhanced de-tanning effect due to higher papaya extract.

Improved skin hydration and soothing from increased aloe vera and oils.

Reduced irritation potential with adjusted turmeric.

Soap should maintain good physical properties and stability.

RESULT

Trial 1:

The initial formulation produced soap bars with a smooth texture, light beige color, and a mild herbal fragrance. The pH was between 8 and 9, suitable for skin use. The soap demonstrated moderate to rich foam and good cleansing ability. Volunteers using the soap twice daily for four weeks reported noticeable reduction in skin tanning, improved brightness, and softer skin. No adverse reactions were observed. The soap remained stable over six weeks without changes in appearance or scent.

Trial 2:

The optimized formulation with increased papaya extract and aloe vera, reduced turmeric, and adjusted oil ratios showed improved moisturizing and soothing effects. The soap bars retained firmness and had a slightly brighter color. The pH remained in the safe range (8-9), and foaming was comparable to Trial 1. Volunteers reported a greater reduction in tanning and enhanced skin smoothness and hydration after four weeks compared to Trial 1. No irritation was noted. Stability testing showed the product remained consistent in quality over six weeks.

Comparison:

Trial 2's adjustments led to better overall skin benefits, particularly in tanning reduction and hydration, without compromising soap stability or safety. The increase in papaya extract and aloe vera gel positively impacted exfoliation and skin soothing, while the slight reduction of turmeric minimized any potential irritation.

CONCLUSION:

The lab-scale trials successfully developed a herbal de-tanning soap using natural ingredients known for their skin-brightening and moisturizing properties. Both formulations demonstrated good physical stability, safe pH levels, and effective foaming. Trial 2, with optimized ingredient concentrations, showed enhanced de-tanning effects and improved skin hydration without causing irritation. These findings suggest that the herbal soap is a promising, natural alternative for reducing skin tanning and promoting healthier, brighter skin. Further large-scale studies and long-term clinical evaluations are recommended to confirm these benefits.

REFERENCES:

1. Draelos, Z.D. (2012). Cosmetic Dermatology: Products and Procedures. Wiley-Blackwell.
2. Kaur, C.D., & Saraf, S. (2010). "Therapeutic Potential of Herbal Skin Care Products". Pharmacognosy Reviews, 4(7), 12–17.

3. Raut, N.A., Gaikwad, S.M., & Wadher, S.J. (2012). “Formulation and Evaluation of Herbal Soap Containing Neem and Turmeric”. International Journal of Pharmaceutical Sciences and Research, 3(8), 2635-2641.
4. Subramanian, R., & Mahalakshmi, P. (2014). “Efficacy of Papaya Extract in Skin Lightening”. Journal of Cosmetic Science, 65(4), 205-214.
5. Samarghandian, S., Azimi-Nezhad, M., & Farkhondeh, T. (2017). “Therapeutic Potential of Turmeric: A Review”. Phytotherapy Research, 31(2), 183-195.
6. Chatterjee, S., & Pakrashi, S.C. (1995). The Treatise on Indian Medicinal Plants. Publications and Information Directorate, CSIR, New Delhi.
7. Akinmoladun, F.O., & Oboh, G. (2014). "Antioxidant Properties of Some Selected Tropical Fruits." African Journal of Biotechnology, 13(22), 2063-2070.
8. Gupta, S.C., Patchva, S., & Aggarwal, B.B. (2013). "Therapeutic Roles of Curcumin: Lessons Learned from Clinical Trials." The AAPS Journal, 15(1), 195-218.
9. Harborne, J.B. (1998). Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis. Springer.
10. James, J., & Dubey, A.K. (2017). "Formulation and Evaluation of Herbal Soaps Using Natural Oils and Extracts." International Journal of Pharmaceutical Sciences and Research, 8(11), 4705-4712.
11. Kumar, N., & Singh, M. (2015). "Natural Ingredients as Skin Whitening Agents: A Review." Journal of Cosmetic Dermatology, 14(2), 121-130.
12. Lee, S.E., & Lee, J.H. (2019). "Effect of Licorice Extract on Skin Brightening: A Clinical Study." Journal of Dermatological Science, 93(3), 159-167.
13. Rao, S., & Vijayalakshmi, N.R. (2016). "Efficacy of Aloe Vera Gel in Skin Moisturization and Healing." International Journal of Dermatology, 55(2), 231-238
14. Singh, R., & Arora, S. (2020). "Herbal Cosmetics: Trends and Applications." Pharmacognosy Reviews, 14(27), 80-86.