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Research Article

Development of Herbal Body Wash with Antioxidants and Antimicrobial Properties

Dr. Gururaj Kulkarni*, Adithi P., Shwetha S. Reddy, Yashaswini S. M., Amulya S., Anand, Krishna R.

The Oxford College of Pharmacy, Hongasandra, Bommanahalli, Bengaluru-68.

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ABSTRACT

Herbal body washes are now a popular part of contemporary skincare regimes due to the growing global trend toward natural and environmentally friendly personal care products. Unlike conventional synthetic cleansers, herbal body washes are formulated with plant-derived ingredients that offer multifunctional dermatological benefits, including antimicrobial, antioxidant, and hydrating properties. This study focuses on the formulation, evaluation, and potential applications of herbal body washes as a sustainable alternative to chemical-based products. By incorporating bioactive components such as, dragon fruit, almond oil, and cucumber, these preparations not only cleanse effectively but also nourish and protect the skin without causing dryness or irritation. Furthermore, their mild nature, chemical-free composition, and environmental compatibility align with the increasing consumer demand for safe and biodegradable skincare solutions. The present article emphasizes the scientific basis of herbal ingredients, formulation strategies, evaluation parameters, and their comparative advantages over synthetic formulations. The findings highlight that herbal body washes represent a promising innovation in skincare technology by combining efficacy, safety, and sustainability, thus meeting the dual objective of skin health and ecological responsibility.

INTRODUCTION

Skin, the body's largest organ, acts as a barrier against various insults while aiding hydration and sensory functions. Healthy skin maintenance necessitates regular cleansing, yet conventional

body washes often contain harsh chemicals that can harm the skin barrier. Consequently, consumers increasingly prefer natural, herbal-based skincare that is safe and effective. Herbal body washes utilize plant extracts and oils to cleanse gently while providing therapeutic effects. Ingredients like cucumber and dragon fruit deliver

***Corresponding Author:** Dr. Gururaj Kulkarni

Address: The Oxford College of Pharmacy, Hongasandra, Bommanahalli, Bengaluru-68.

Email ✉: skguru2006@gmail.com

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antibacterial, antioxidant, and soothing properties, aiding pH balance and skin health without synthetic additives. This study highlights cucumber's hydrating and anti-inflammatory effects, dragon fruit's antioxidant benefits, and almond oil's moisturizing properties. Herbal formulations are biodegradable, thus reducing environmental pollution. Effective development of these washes requires careful ingredient selection focusing on cleansing efficacy and therapeutic value. Scientific evaluations ensure safety and effectiveness. This research explores formulation strategies and skin benefits of herbal body washes, emphasizing their role in the sustainable skincare movement.

HERBAL BODY WASH:

Herbal body wash is a type of liquid soap that is prepared from natural, plant-based materials such as flowers, herbs, and essential oils. It is intended to gently cleanse the skin while also offering soothing and hydrating properties.

CHARACTERISTICS:

- a. **Natural ingredients:** Usually free of harsh synthetic chemicals like parabens and sulphates, they contain essential oils and plant-based extracts.
- b. **Gentle cleansing :** It helps preserve the moisture balance of the skin by cleaning it without removing its natural oils.
- c. **Hydration:** Aloe vera and other ingredients aid in retaining and moisturizing.
- d. **Calming:** Anti-inflammatory qualities help reduce irritability.
- e. **Antimicrobial:** To treat skin disorders like acne, several herbs have antibacterial and antifungal qualities.

- f. **Antioxidants:** Provide defense against harm to the environment.
- g. **Environmental safety:** Compared to products containing synthetic chemicals, many herbal body washes are biodegradable, which means they decompose more easily in the environment and have less of an effect on ecosystems.

DRUG PROFILE:

a. Dragon Fruit Hylocereus spp. Taxonomy:

Kingdom: Plantae

Family: Cactaceae

Genus: Hylocereus (syn. Selenicereus)

Species: Hylocereus undatus / Hylocereus polyrhizus
Common names: Dragon fruit, Pitaya

Plant Description:



A climbing cactus with fleshy three-angled stems and large night-blooming white flowers. The fruits are oval with bright red or yellow skin and white or red pulp containing small black seeds. Widely cultivated in tropical and subtropical regions.

Chemical Composition:

Contains betacyanins and betaxanthins (natural pigments), phenolic compounds, flavonoids, vitamin C, and minerals. Red-fleshed varieties

have high antioxidant content. The pulp is rich in water, sugars, and dietary fiber.

b. Cucumber — *Cucumis sativus* Taxonomy:

Kingdom: Plantae

Family: Cucurbitaceae

Genus: *Cucumis*

Species: *Cucumis sativus* L. Common name: Cucumber

Plant Description:



An annual creeping vine with yellow flowers and cylindrical green fruits. Cultivated worldwide for fresh consumption and pickling.

Chemical Composition:

Contains 90–95% water, small amounts of carbohydrates and proteins, and trace amounts of cucurbitacin's (bitter triterpenoids). Rich in volatile aldehydes, phenolics (mainly in peel), and vitamin K. Used in cosmetic preparations for cooling and moisturizing effects.

METHODS AND MATERIALS:

2.1 Drugs and Chemicals

Table.1: Formulation ingredients

Ingredients	Properties
Dragon fruit peel extract	Anti-oxidant property
Cucumber extract	Anti-microbial and Anti-oxidant properties
Almond oil	Nourishment and enhance skin hydration

Cocoa butter	Emollient and moisturizer
Xanthum gum	Natural thickener and emulsifier
Sodium lauryl sulphate (SLS)	Foaming agent
Glycerin	Humectant and moisturizing effects
Poly ethylene glycol (PEG 400)	Emulsifier and humectant
Citric acid	pH balancer
Ethanol	preservative
Lavender oil	Fragrance
Distilled water	solvent

2.2 PREPARATION OF CRUDE EXTRACT

1. Dragon fruit peel extract:

The flesh was removed and the peel was collected sliced and made to dry in hot air oven. Later on it was grounded into fine powder and sifted through a 150 mesh screen. This powder undergone extraction via maceration process. Subsequently the powder was mixed with ethanol macerated for 24 hrs and filtered using Whatman filter paper. The resulting solution was utilized for the subsequent formulation process.



Fig.1: Dragon fruit peel extract

2. Cucumber extract:

The skin was removed and cucumber flesh was grated. The grated material undergone extraction

via maceration. Subsequently, the grated material was mixed with ethanol, macerated for 48hrs at room temperature away from direct sunlight. Later on it was filtered using Whatman filter paper. The resulting solution is utilized for the subsequent formulation processes.



Fig.2: Cucumber extract

2.3 FORMULATION OF HERBAL BODY WASH:

- All the active pharmaceutical ingredients and excipients were measured accurately.
- In a clean beaker add 15ml of distilled water was taken and xanthum gum was sprinkled in the water while stirring continuously to prevent lumps and form a clear gel.
- Add glycerine, peg 400 and citric acid to xanthum gum gel mixture and mix well
- In a separate container, melt the cocoa butter then add almond oil, ethanol, lavender oil and stir.
- Dissolve the sodium lauryl sulphate (SLS) in a small amount of distilled water separately with gentle stirring, now slowly add the surfactant solution to the water phase with continuous stirring, now add dragon fruit peel extract and cucumber extract to the mixture and stir gently.

- Add the oil phase slowly to the combined mixture and stir gently but thoroughly to get a smooth blend, check the final pH and adjust if needed.
- The body wash was poured into a clean container and stored in a cool place.

Table: Composition of a herbal body wash:

Table.2: Formulation development table

Sl. No	Material	F1	F2	F3	F4
1	Dragon fruit peel extract	1.2ml	1.4ml	1.8ml	2ml
2	Cucumber extract	1ml	1.4ml	1.8ml	2ml
3	Almond oil	1ml	1ml	1ml	1ml
4	SLS	3g	3g	3g	3g
5	Glycerine	2ml	2ml	2ml	2ml
6	Cocoa butter	0.8g	0.8g	0.8g	0.8g
7	PEG 400	0.6ml	0.6ml	0.6ml	0.6ml
8	Ethanol	1ml	1ml	1ml	1ml
9	Xanthum gum	0.4ml	0.4ml	0.4ml	0.4ml
10	Citric acid	0.05ml	0.05ml	0.05ml	0.05ml
11	Lavender oil	q.s	q.s	q.s	q.s
12	Distilled water	q.s	q.s	q.s	q.s

2.4 EVALUATION OF HERBAL BODY WASH : The prepared shower gel was evaluated for various parameters as follows,

2.4.1 Physical appearance:

The physical appearance of the formulation was checked visually which comprised

2.4.2 Colour:

The colour of the formulation was checked out against white background.

2.4.3 Odor:

The odour of the shower gel was analysed manually.

2.4.4 pH

An amount of herbal body wash was taken in a beaker and subjected to the pH measurement using a digital pH meter.

2.4.5 Spreadability:

- The test of Spreadability involved of applying the product (at room temperature) repeatedly onto a glass slide to visually observe the uniformity in the formation of the protective layer. $S = m \times l/t$
- Where
 - ⇒ m = weight applied to the upper slide(100)
 - ⇒ l = length moved on the slide(3cm)
 - ⇒ t = time taken (30sec)
 - ⇒ $S = m \times l/t$

2.5 ANTI-OXIDANT ACTIVITY:

The antioxidant activity of the test sample (Sample SF) was determined by the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging method. By accurately weighing 3.60 mg of DPPH and dissolving it in methanol, a 0.1 mM DPPH solution was created. The volume was made up to 100 mL with methanol in a volumetric flask. The solution was stored in an amber-coloured bottle at 4°C to protect it from light and prevent degradation.

A standard antioxidant solution of ascorbic acid was prepared by dissolving 25 mg of ascorbic acid in 250 mL of methanol to obtain a stock solution. Dilution was used to obtain various concentrations from this stock, ranging from 1 to 64 g/ml. In a similar manner, a stock solution of 50 milligrams of Sample SF was dissolved in 50 millilitres of methanol to produce a test sample solution from which concentrations ranging from 10 to 640 g/mL were prepared for the assay. In clean test tubes, 2 mL of the DPPH solution was combined with 2 mL of the standard or sample solution for the experiment. 2 mL of methanol and 2 mL of DPPH solution were combined to make a control. All the mixtures were vortexed gently to ensure uniform mixing. The reaction mixtures were then incubated in the dark at room temperature for 30 minutes to avoid light-induced reactions. After incubation, the absorbance of each solution was measured at 517 nm using a UV-Visible spectrophotometer, with methanol serving as the blank. Using the following formula, the percentage of DPPH radical scavenging activity was determined:

$$\text{Scavenging activity (\%)} = \frac{(\text{A control} - \text{A sample})}{\text{A Control}} \times 100$$

Where:

- A control = Absorbance of DPPH solution without sample
- A sample = Absorbance of DPPH solution with the test sample

2.6 ANTI- MICROBIAL TEST:

a)Preparation of nutrient broth: In order to keep the culture media sterile throughout the process, it was prepared in aseptic conditions. For the preparation of nutrient broth, the required quantity of nutrient broth powder (as per manufacturer's



instructions, usually 13 g per litre of distilled water) was accurately weighed and dissolved completely in freshly distilled water. The medium was mixed thoroughly until a clear solution was obtained. Depending on the requirements, dilute hydrochloric acid or sodium hydroxide was used to adjust the medium's pH to 7.2 $\pm$ 0.2. Sterilized for 15 minutes in an autoclave at 121 °C, the prepared broth was dispensed into clean conical flasks or test tubes and tightly sealed with cotton plugs. After sterilization, the medium was allowed to cool at room temperature before inoculation of the bacterial culture.

b)Preparation of nutrient Agar: the composition was similar to that of nutrient broth with the addition of agar-agar (usually 15 g per litre) as a solidifying agent. Using gentle heating, the measured amounts of nutrient agar powder and agar were dissolved in distilled water until a clear, homogeneous solution was produced. The pH was adjusted to 7.2 $\pm$ 0.2, and the medium was distributed into suitable containers such as flasks or bottles. Sterilization was carried out by autoclaving at 121 °C for 15 minutes. After autoclaving, the molten agar was cooled to about 45–50 °C and poured into sterile Petri plates in a laminar airflow chamber. Before being used for microbial inoculation and well-diffusion testing, the plates were allowed to solidify before being stored in an inverted position at 4 °C.

3.RESULTS AND DISCUSSION

All the evaluation tests were done the results were recorded and reported.

3.1 Organoleptic properties

3.2 pH test

The pH of herbal body wash was found to be 5.07.



Fig.3:pH test

3.3 Viscosity

The viscosity of herbal body wash was found to be 200 to 400 centipoise and flow time is between 30-60seconds.



Fig.4: viscosity test

3.4 Spreadability

The Spreadability of the herbal body wash as shown uniform spreading in room temperature.



Fig.5:Spreadability test

3.5 Anti-microbial activity

Inhibitory activity of test compounds against test organisms

Test Organisms	Test Compounds	Conc. per well	Zone of inhibition (cm)
<i>Escherichia coli</i>	Standard disc (Nitrofurantion)	300 mcg	1.5
	Sample VS	30µl	1.8

Standard vs Sample



4.CONCLUSION:

The present study was undertaken to formulate, develop, and evaluate a herbal body wash that combines cleansing efficacy with natural therapeutic properties. The formulation incorporated dragon fruit peel extract, cucumber extract, and almond oil as its primary active ingredients, supported by safe excipients such as cocoa butter, glycerin, xanthan gum, and lavender oil.

The overall objective was to create a product that is gentle on the skin, provides antioxidant and antimicrobial protection, and serves as a sustainable alternative to conventional, chemical-based cleansers. The formulated body wash displayed an appealing pale pink color, a pleasant fragrance, and a clear, smooth appearance, which are essential for consumer acceptance. The pH value of 5.07 indicated excellent compatibility with the skin's natural acidic mantle, ensuring that

the product does not cause irritation or disrupt the skin barrier. The spreadability tests confirmed the product's smooth and uniform texture, which facilitates easy application and even coverage during use. These physical and sensory characteristics demonstrate that the herbal body wash can meet both functional and aesthetic consumer expectations.

REFERENCES

1. Wichienchot, S., Jatupornpipat, M. & Rastall, R. A. Oligosaccharides of pitaya (dragon fruit) flesh and their prebiotic properties. Food Chem. 120(3), 850–857 (2010).
2. Albano & Miguel (2011). Albano SM, Miguel MG. Biological activities of extracts of plants grown in Portugal. Industrial Crops and Products. 2011;33:338–343. doi: 10.1016/j.indcrop.2010.11.012.
3. Abolhassani M, Roux KH. 2009. cDNA cloning, expression and characterization of an allergenic 60s ribosomal protein of almond (*Prunus dulcis*). Iran. J. Allergy Asthma Immunol. 8(2):77– 84
4. Burnett, CL, Fiume MM, Bergfeld WF, Belsito DV, Hill RA, Klaassen CD, Liebler DC, Marks JG, Shank RC, Slaga TJ, Snyder PW, and Andersen FA. Safety assessment of plant-derived fatty acid oils as used in cosmetics. Washington, D.C., Cosmetic Ingredient Review. 2011
5. G.D.Nielsen, J.B.Nielsen, K.E. Andersen and P.Grandjean "effects of industrial detergents on the barrier function of human skin" International Journal of Occupational and Environmental health vol 6, no2, pp.130-142, 2000
6. Brud W, Glinka R Technologia kosmetykow technology of cosmetic. Wydawnictwo. MA, Warszawa.



7. Frosch PJ, Kligman AM the bodywash chamber test: a new method for assessing the irritancy of body wash. *J Am Acad Dermatol*
8. Kaypetch R: Thaweboon, S. Antifungal property of piper betel leaf oil against oral *Candida* species. *Matec Web Conf.* 2018;242,01021.
9. Arambewela, L: Arawwawala, M: withanag, D: Kulatunga, S. Efficacy of betel cream on skin ailments. *J Complementary Integr Med.* 2010;7
10. Moriya H, Lizuka T, Nagai M, Satoh. Anti-inflammatory activity of heat treated cassia alata leaf extract and its flavonoids glycoside. *Yakugaku Zasshi* 2003.
11. Imran M, Mehmood T, Khan S, et al. Rose oil in skin rejuvenation and healing: A review. *Nat Product Res.* 2021;35(19):3222-3228.
12. Sekar A, Nagendra P. Almond oil in skincare: An effective, natural approach to moisturizing and protection. *J Dermatol Treat.* 2020;31(1):29-36.
13. Patel D, Shah A, Nair P, et al. Cucumber extract and its effects on skin hydration and irritation. *Dermatol Res Pract.* 2018;2020:1-6.
14. Mistry T, Khan D, Patel P. The role of coffee in skin exfoliation and circulation. *Cosmet Dermatol.* 2021;6(2):45-51.
15. G. Bore handbook of detergents. part A: properties, Taylor and Francis group, Boca Raton, FL, USA, 1999
16. Al-Harbi M, Abdulwasi' A. Aloe Vera: A Review on Its Biological Activities and Applications. *Int J Pharm Sci.* 2018;10(5):233-238.
17. Sahu P, Keshar Wani P, Nanda A, et al. Neem: The herb for health and wellness. *J Pharm Biomed Sci.* 2017;7(3):101-106.

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