Journal of Medicinal Plants Studies
www.PlantsJournal.com

**ISSN (E): 2320-3862**
**ISSN (P): 2394-0530**
**NAAS Rating: 3.53**
www.plantsjournal.com
JMPS 2021; 9(2): 115-117

Received: 08-01-2021
Accepted: 13-02-2021

**Latif Ahmed**
Quality Control Manager
Stay Fresh and Glow Ltd.
Vill. Dorakohora, Kamrup (R),
Assam, India

**MU Hazarika**
Production Manager
Stay Fresh and Glow Ltd.
Vill. Dorakohora, Kamrup (R),
Assam, India

**Dhrubajyoti Sarma**
Sr. Scientific Officer
SDTL, AYUSH, Jalukbari,
Guwahati, Assam, India

**Corresponding Author:**
**Latif Ahmed**
Quality Control Manager
Stay Fresh and Glow Ltd.
Vill. Dorakohora, Kamrup (R),
Assam, India

# Formulation and evaluation of an ayurvedic bath soap containing extracts of three ayurvedic herbs

**Latif Ahmed, MU Hazarika and Dhrubajyoti Sarma**

**Abstract**
**Objectives:** The ultimate aim of this study is to formulate and evaluate the ayurvedic bath soap using methanolic extracts of three plants having ethnic and dermatological importance in Ayurveda, namely, aloevera, neem and palm oil.
**Methods:** The leaf of aloevera and neem were extracted with ethanol using Soxhlet apparatus. Then, these extracts were used to make soap by reacting oil and lye in a process of saponification.
**Results:** The soap made was evaluated for physicochemical characters such as total fatty matter, moisture content, pH and for other parameters, good characteristics were observed.
**Discussion:** The soap also exhibited good cleaning efficiency in removing microbes on hands. Conclusion: Hence, based on the antimicrobial effects and parameters, the formulated soap can further be standardized and an alternative to commercial medicinal and skin whitening soaps.

**Keywords:** herbal bath soap, ayurvedic herbs, medicinal soap

## 1. Introduction
Human skin, the outer covering of the body constitutes the first line of defense protecting the body against various pathogens [1]. As the skin interfaces with environment, it is constantly exposed to different environmental stimuli. This makes the skin damage prone [2]. Severely damaged skin will often try to heal by forming scar tissue, which is often decolorized and depigmented. Plants have been used in the treatment of human diseases and infections since ages [3]. The active constituents of plants can be formulated as ointment, cream, gel, lotion, soap, or crude/solvent extract [4, 5]. Utilization of plant extracts and their derived phytoconstituents have a likely future for controlling hyperpigmentation [6]. Plant-based remedies mentioned in ayurvedic texts are gaining popularity these days in India due to validation of such therapies with respect to their modern counterparts. Soaps are one among the modern-day cosmetics for maintaining and enhancing the vigor of skin. However, the present chemical soaps quite frequently can cause dryness and irritation of the skin [9]. Interestingly, the popularity of herbal-based soaps is increasing due to their efficacy on topical disorders. The plants that mentioned under varnya herbs in Ayurveda and their modern counterpart, i.e., tyrosinase inhibition is also proven.

### 1.1 *Aloe barbadensis* miller
Common name Aloevera. The preliminary phytochemical screening showed the presence of alkaloids, glycosides, steroids, triterpenoids, carbohydrates, polyphenols, and saponins [10]. It belongs to Asphodelaceae (Liliaceae) family.

#### 1.1.1 Pharmacological activities
*Aloe vera* gel has been reported to have a protective effect against radiation damage to the skin. Exact role is not known, but following the administration of *Aloe vera* gel, an antioxidant protein, metallothionein, is generated in the skin, which scavenges hydroxyl radicals and prevents suppression of superoxide dismutase and glutathione peroxidase in the skin. It reduces the production and release of skin keratinocyte-derived immunosuppressive cytokines such as interleukin-10 (IL-10) and hence prevents UV-induced suppression of delayed type hypersensitivity.

### 1.2 Lemon

*Citrus limon* (L.) Burm. f. is a tree with evergreen leaves and yellow edible fruits from the family *Rutaceae*. In some languages, *C. limon* is known as lemon (English),

The lemon has the effects of whitening and moisturizing the skin, so the soap prepared by the method can clean the skin, and also has the effects of whitening and moisturizing the skin; lemon juice is added at last, so the lemon juice is not damaged by alkali liquor; and the soap has the natural aroma of the lemon, so the soap brings refreshing and cheerful feeling to people.

Phytochemical evaluation on extracts revealed the presence of alkaloids, flavonoids, carbohydrates, glycosides, phenolic compounds, saponins, and tannins [12].

#### 1.2.1 Pharmacological activities

The pharmacological potential of *C. limon* is determined by its rich chemical composition. The most important group of secondary metabolites in the fruit includes flavonoids and also other compounds, such as phenolic acids, coumarins, carboxylic acids, aminoacids and vitamins. The main compounds of essential oil are monoterpenoids, especially D-limonene. These valuable chemical components are the reason for the important position of *C. limon* in the food and cosmetics industries

### 1.3 Palm oil/ *Elaeis guineensis*

Oil palm is the second largest source of edible oil, next only to soybean. It contributes approximately one-fifth of the world's production of oils and fats, and belongs to the genus *Elaeis*

Common name Mustaka/Nagarmotha. Phytoconstituents the preliminary phytochemical screening of C. rotundus revealed the presence of alkaloids, carbohydrates, glycosides, steroids, flavonoids, saponins, tannins, and phenols

Pharmacological activities It is added to skin care products not only for its anti-aging properties, but also because it provides deep moisturizing properties making the skin soft and supple. The best thing you can do for your hair and skin is eating a healthy diet and drinking appropriate amounts of water.

## 2. Methods

**2.1 Acquisition of samples:** Authenticated samples of herbs were purchased from the local herb dealer.

**2.2 Preparation of extracts:** The herbs were dried and powdered to #40 mesh size and stored. The powder was then extracted with ethanol. The extracts were concentrated and stored for further use. Formulation of ayurvedic soap

Saponification values of oil samples were determined as per standard protocol. samples were taken in a beaker and mixed together. In another beaker, 70.8 g lye was dissolved in 166.5 g of water. The lye solution was then transferred to the beaker of oils. After stirring for a while, add three ethanolic extracts Then, the beaker was heated on low heat and stirred well for about 20–30 min where the smell of oil disappears and a homogenous solution is formed. The mixture was poured into the soap molds and allowed to solidify at room temperature [21].

### 2.3 Assessment of physicochemical properties of the formulated soap

Various physicochemical parameters were tested to confirm the quality of the formulated soap [22]. Determination of clarity, color, and odor Color and clarity were checked against a white background by naked eyes and odor was checked by smelling.

### 2.4 pH

The pH of the prepared soap was assessed by touching a pH strip to the freshly formulated soap and conjointly by dissolving 1 g in 10 ml water with the help of digital pH meter.

### 2.5 Determination of percentage free alkali

About 5 g of sample was added to 50 ml of neutralized alcohol and was boiled for 30 min under reflux on a water bath, then cooled and to it 1 ml of phenolphthalein solution was added. It was then titrated immediately with 0.1 N HCl [22]. Foam height 0.5 g of sample of soap was dispersed in 25 ml distilled water. Then, transferred it into 100 ml measuring cylinder and the volume was made up to 50 ml with water. Twenty-five strokes were given and allowed to stand till aqueous volume measured up to 50 ml and the foam height above the aqueous volume was measured [22].

### 2.6 Foam retention

About 1% soap solution was prepared and from this, 25 ml was taken in a 100 ml measuring cylinder. The cylinder was covered with hand and shaken for 10 min. The volume of foam at 1 min intervals for 4 min was recorded [22].

### 2.7 Alcohol-insoluble matter

In a conical flask, 5 g of sample was taken. To this, 50 ml of warm ethanol was added and it was shaken vigorously, until the sample was dissolved completely. The solution was filtered through a tared filter paper along with 20 ml warm ethanol and dried it at 105 ℃ for 1 h. The weight of dried paper was noted [22].

### 2.8 Total fatty matter (TFM)

TFM was estimated by reacting soap with acid in the presence of hot water and calculating the fatty acids obtained [21]. 10 g of the formulated soap was dissolved in 150 ml distilled water and heated. To this, 20 ml of 15% H2 SO4 added while heating until a clear solution was obtained. Fatty acids that are present on the surface of the resulting solution are solidified by adding 7 g beeswax and heated again. Then, it was allowed to cake. Cake was removed and blotted to dry and weighed to obtain the TFM using the formula [21]. % TFM=(Weight of the cake–Weight of the wax) in g/Weight of the soap in g×100.

### 2.9 Moisture content

The moisture content was used to estimate the percentage of water in the soap by drying the soap to a constant weight. The soap was weighed and recorded as "wet weight of sample" and was dried from 100 to 115°C using a dryer [21]. The sample was cooled and weighed to find the "dry weight of sample." The moisture content was determined using the formula [22]: % Moisture content=Initial weight–Final weight/Final weight × 100

## 3. Results

The physicochemical parameters such as color, odor, appearance, and pH were tested. Parameters such as foam height, foam retention, percentage free alkali, TFM, moisture content, and alcoholic insoluble matter were also determined and the results are tabulated in Table 1. In addition, thumb impression test was carried out to investigate the effectiveness

of the formulated soap taking a commercial soap as standard. Color was determined by comparing with standard color charts, odor by smelling, and remaining parameters as per standard methods.

**Table 1:** The physicochemical parameters such as color, odor, appearance, and pH were tested

| S.L. No. | Name of Test | Result |
|---|---|---|
| 1 | Colour | Light green |
| 2 | Odour | Pleasant |
| 3 | Average Weight | 60.36 gm |
| 4 | LOD | 5.58 % |
| 5 | Ph (10% aq. Solution) | 11.32 |
| 6 | Foam height (1%aq. Solution) | 44ml |

## 4. Discussion

The present work is concerned with the formulation of soap using ethanolic extracts of ayurvedic varnya. The formulated soap was a dry, stable solid showing no color change and good appearance and is foamy in nature without any added surfactants. It showed good skin compatibility and causes no irritation when tested on 10 volunteers. Based on the estimated TFM (77%), the soap was characterized as Grade 1 soap.

## 5. Conclusion

The formulated soap showed considerable commercial standard and all the other parameters were good, and hence, it can be concluded that the formulated herbal soap is standardized and can be used as a promising alternative to commercial chemical containing skin whitening soaps.

## 6. Acknowledgments

The authors are thankful to Drug Testing Laboratory, AYUSH for providing necessary facilities to carry out this research work.

## 7. References

1. Proksch E, Brandner JM, Jensen JM. The skin: An indispensable barrier. Exp Dermatol 2008;17:1063-72.
2. Maru AD, Lahoti SR. Formulation and evaluation of moisturizing cream containing sunflower wax. Int J Pharm Pharm Sci 2018;11:54-9.
3. Pushpa R, Mamta A, Sharma S. Phytochemical and antioxidant properties of various extracts of Michelia champaca leaves. Int J Pharm Pharm Sci 2019;11:5-614.
4. Oyedele AO, Akinkunmi EO, Fabiyi DD, Orafidiya LO. Physicochemical properties and antimicrobial activities of soap formulations containing Senna alata and Eugenia uniflora leaf preparations. J Med Plant Res 2017;11:778-87.
5. Esimone C, Nworu C, Ekong U, Okereke B. Evaluation of the antiseptic properties of Cassia alata-based herbal soap. Internet J Alternat Med 2007;6:1-5.
6. Sharma K, Joshi N, Goyal C. Critical review of ayurvedic varnya herbs and their tyrosinase inhibition effect. Anc Sci Life 2015;35:18-25.
7. Pulok M, Rajarshi B, Akanksha S, Subhadip B, Sayan B, Chandra K. Validation of medicinal herbs for anti-tyrosinase potential. J Herb Med 2018;14:1-16.
8. Hunt JA. A short history of soap. Pharm J 1999;263:985-9.
9. Mukhopadhyay P. Cleansers and their role in various dermatological disorders. Indian J Dermatol 2011;56:2-6.
10. Nagat M, Barka E, Lawrence R, Saani M. Phytochemical screening, antioxidant and antibacterial activity of active compounds from *Hemidesmus indicus.* Int J Curr Pharm Res 2016;8:24-7.
11. Manjulatha P. Phytochemistry, Pharmacology and Therapeutics of *Hemidesmus indicus* (L.). Vol 3. New Delhi: Daya Publishing House 2014.
12. Uma C, Shrusti S, Chandrasek SB, Bhanumathy M, Midhun T. Phytochemical evaluation and anti-arthritic activity of root of *Saussurea lappa*. Pharmacologia 2011;2:265-7.
13. Pandey MM, Rastogi S, Rawat AK. *Saussurea costus*: Botanical, chemical and pharmacological review of an ayurvedic medicinal plant. J Ethnopharmacol 2007;110:379-90.
14. Kamala A, Middha SK, Gopinath C, Sindhura HS, Karigar CS. *In vitro* antioxidant potentials of *Cyperus rotundus* L. Rhizome extracts and their phytochemical analysis. Pharmacogn Mag 2018;14:261-7.
15. Sivapalan SR. Medicinal uses and pharmacological activities of *Cyperus rotundus* Linn: A review. Int J Sci Res 2013;3:1-8.
16. Bernard P, Berthon JY. Resveratrol: An original mechanism on tyrosinase inhibition. Int J Cosmet Sci 2000;22:219-26.
17. Yi W, Cao R, Peng W, Wen H, Yan Q, Zhou B *et al*. Synthesis and biological evaluation of novel 4-hydroxybenzaldehyde derivatives as tyrosinase inhibitors. Eur J Med Chem 2010;45:639-46.
18. Kundu A, Mitra A. Evaluating tyrosinase (monophenolase) inhibitory activity from fragrant roots of Hemidesmus indicus for potent use in herbal products. Ind Crops Prod 2014;52:394-9.
19. Shetty TK, Satav JG, Nair CK. Radiation protection of DNA and membrane *in vitro* by extract of Hemidesmus indicus. Phytother Res 2005;19:387-90.
20. Lee KT, Kim BJ, Kim JH, Heo MY, Kim HP. Biological screening of 100 plant extracts for cosmetic use (I): Inhibitory activities of tyrosinase and DOPA auto-oxidation. Int J Cosmet Sci 1997;19:291-8.
21. Ruckmani K, Krishnamoorthy R, Samuel S, Linda H, Kumari J. Formulation of herbal bath soap from Vitex negundo leaf extract. J Chem Pharm Sci 2014;2:974-2115.
22. Afsar Z, Khanam S. Formulation and evaluation of poly herbal soap and hand sanitizer. Int Res J Pharm 2016;7:54-7.
23. Kaur M, Dhawan P, Damor S, Arora D, Soni IP. Investigating and exploiting the antibacterial potential of clove (*Eugenia caryophyllyum*) extracts while utilizing it to the maximum to develop liquid soap against drug resistant bacteria causing skin diseases. Int J Pharm Biol Arch 2014;5:110-5.
24. Wijetunge WM, Perera BG. Preparation of liquid medicinal soap products using *Adhatoda vasica* (Adhatoda) leaf extracts. Int J Multidiscip Stud 2015;2:73-81.