

Content available at: <https://www.ipinnovative.com/open-access-journals>

Indian Journal of Pharmacy and Pharmacology

Journal homepage: <https://www.ijpp.org.in/>

Original Research Article

Formulation and evaluation of herbal hand wash using neem and aloe vera extract

Komal Tikariya^{1,*}, Arpit Gawshinde¹, Ali Dabeer¹, Sonu Mishra¹,
Umesh K. Atneriya², Dharmendra Solanki¹¹Dept. of Pharmaceutics, BM College of Pharmaceutical Education and Research, Indore, Madhya Pradesh, India²Dept. of Pharmaceutics, School of Pharmacy, Devi Ahilya Vishwavidyalaya, Indore, Madhya Pradesh, India

ARTICLE INFO

Article history:

Received 26-05-2023

Accepted 20-06-2023

Available online 04-07-2023

Keywords:

Herbal Hand Wash

Neem extract

Lemon juice

Natural Ingredients

Essential oil

ABSTRACT

Background: The herbal cosmetics are natural and free from all the harmful synthetic chemicals which generally may turn out to be lethal to the skin, the natural ingredient used assures no side effect one can applied them any time. So, herbal cosmetic are more referable as compared to synthetics one.

Aim and Objective: The purpose of the present work is to formulate and evaluated herbal hand wash using natural ingredients to promote the personal hygiene. The formulated hand wash was evaluated for different parameters like pH, colors, foaming efficiency, viscosity and stability.

Materials and Methods: The herbal hand wash formulated using neem extract for antibacterial property, aloe vera juice for soothing property, glycerine for moisturization, sodium lauryl sulphate as a surfactant, carbopol 934 as a jelling agent, rose oil for fragrance and distilled water, the hand wash is prepared and evaluated then the result was documented.

Finding: 5 People were asked for acceptability of fragrance and their opinion was taken. The fragrance was found to be good as compared to reference hand wash.

Result and Conclusion: The hand wash was found to be light green aromatic and homogeneous with rosy fragrance. pH was 6.0 which is similar to the skin pH. The hand wash was found to be stable in all evaluation parameters with good cleaning property.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

1.1. Herbal cosmetic

The cosmetics which are formulated using herbs having cosmetic actions. Recently the use of botanicals in cosmetics has increase mainly due to mild action and toxic nature. In cosmetics, both natural and phyto ingredients are used Natural products includes oils, extracts, secretions etc. Phyto ingredients include pure constituents obtained by various processes.¹

1.2. Advantages of herbal cosmetics

1. **Natural Products:** The Herbal cosmetics are natural and free from all the harmful synthetic chemicals which generally may turn out to be lethal to the skin.
2. **Safe to use:** Natural cosmetics are the protected to utilize. These are hypoallergenic and proven by the dermatologists to be safe to use anytime, anywhere Since they are made of natural ingredients, people don't have to worry about getting skin rashes or experience skin itchiness
3. **Compatible with all skin:** types No matter if skin is dark or fair; will find natural cosmetics like foundation, eye shadow, and lipstick which are appropriate

* Corresponding author.

E-mail address: komalitikariya77@gmail.com (K. Tikariya).

irrespective of skin tone. Women with oily or sensitive skin can be also use them and never have to worry about degrading their skin condition

4. *Wide selection to choose from:* These products are more affordable than synthetic ones. They are offered at economical prices and are sold for a cheap price during sales. An estimate of WHO demonstrates about 80% of the world population depends on the natural products for their health care, because of side effects inflicted and rising cost of modern medicine
5. *No side effects:* The synthetic beauty products can irritate skin, and cause pimples. They might block your pores and make skin dry or oily with natural cosmetics, one need not worry about these. The natural ingredients use assures no side effects one can apply them anytime.
6. *Cosmeceuticals:* Cosmeceuticals is the fastest growing segment of the beauty industry Cosmeceuticals are cosmetic-pharmaceutical products intended to improve the health and beauty of the skin by providing a specific result, ranging from acne-control and anti-wrinkle effects.



Fig. 1: Neem leaves

1.3. Disadvantages of herbal cosmetics

1. Herbal Cosmetics have slower effects as compare to the allopathic dosage form.
2. Also, it requires long term therapy
3. They are difficult to mask taste and odor.
4. Manufacturing process is time consuming and complicated.¹

1.3.1. *Neem*

1. *Synonym:* Margosa
2. *Biological Source:* It consists of all aerial parts of plant known as *Azadirachta indica*
3. *Family:* Meliaceae
4. *Geographical Source:* It is found in India, Pakistan, Banglades, Shri Lanka, Thailand, Malaysia, Mauritius, Fiji, South Africa and East Africa.

1.4. Macroscopic characters

1. *Leaves:* Alternate, exstipulate, imparipinnate leaflets 5.0 10 cm in length lanceolate closely clustered towards the ends of branches. The leaves have serrate margin, green colour and bitter test.
2. *Bark:* Moderately thick, rough, brown in colour longitudinally and obliquely furrowed Internally starchy white, laminated with characteristic smell of neem and bitter in taste.

1.5. Chemical constituents

Good number of chemicals isolated from the plant belong to the classes diterpenes (sugiol), nibiol (bark), triterpenes:

B-sitosterol, stigmasterol (leaf), Limonoids: Maliantriol (seed oil) nimbidiene (seed oil), Nimbendiol (seed oil and azadiractin (seed), sulphurous compounds Number of cyclic tri and tetrasulphides (leaves), flavonol glycosides Nimaton, quercetin, myrecetin, kaempferol. Neem leaves contain not less than 1.0% w/w of Rutin.^{2,3}

1.5.1. *Uses*

Recently, it has been studied scientifically and reported that it contains different chemical which have insect repellent, insecticide, antifeedant, nematicide and antimicrobial properties. The seed oil has spermicidal activity.⁴⁻⁶

1.5.2. *Aloes*



Fig. 2: Aloe vera leaves

1.5.3. *Synonyms*

Aloe, Musabbar, Kumari.

1.6. Biological source

Aloes is the dried juice of the leaves of *Aloe barbadensis* Miller, known as Curacao Aloe perryi Baker, known as Socotrine aloes; or of *Aloe ferox* Miller and hybrids of this species *Aloe africana* Miller and *Aloe spicata* Baker, known as Cape aloes, belonging to family Liliacea.

1.7. Geographical source

Aloes is indigenous to eastern and southern Africa and grown in Cape colony, Zanziba islands of Socotra. It is also cultivated in Caribbean islands, Europe and many parts including North West Himalayan region.

1.8. History

The word aloes has originated from an Arabic word viz. *aloch* meaning a shining bitter substance. Among the different species, 'vera' means true, 'ferox' means wild, 'spicata' refers to flowers in spikes, and 'barbadensis' and 'africana' refer to habitat of the plant. Among the folklore uses it has been reported that in Congo region of Africa, the natives used to rub the mucilage of leaves for reducing perspiration and masking of human odour, thereby offering protection from wild animals. It is also known that *Aloe barbadensis* was used along with burnt alum for healing sore eyes.⁷

1.9. Cultivation and collection

The genus *Aloe* consists of about 200 species, some of which are used as sources of Aloes. These plants have rosettes of subulate, succulent large leaves (Fig. 9.1). The leaves are sessile and have a strong spine at apex and also number of spines along the margins. The lower portion is rounded and upper portion is slightly concave.⁸

For the cultivation, root suckers are used for propagation. The plants grow even in poor grades of soils and in dry climatic conditions. The root suckers are planted in the rows about 50 cm apart. Water logging near the plant must be prevented. The roots do not penetrate much in the soil. For the purpose of manure, a mixture of nitrogen, potassium and phosphorus is used. The leaves are cut for the first instance in second year of cultivation and the drug is obtained from leaves for twelve years. After twelve years, the plants are completely harvested by uprooting and once again the land is worked for replantation. During the collection of leaves, a cut is given to leaves near their bases, by which the juice located in parenchymatous cells of pericycle exudes out, due to the pressure exerted by mucilage cells. A single incision is sufficient for drawing out all the juice from entire system of pericyclic cells. The preparation of various types of aloes is outlined here.⁹

1.10. Chemical constituents

All the varieties of aloe are the major sources of anthraquinone glycosides. The principal composition of aloe is aloin, which is a mixture of glucosides, among which barbaloin is the constituent. It is chemically aloe-emodin anthrone C-10 glucoside and it is water soluble

Barbaloin is a C-glycoside and it is not hydrolysed by heating with dilute acids or alkalis of chloride

decomposes barbaloin by oxidative hydrolysis into aloe-emodin-anthrone, aloin, emodin and glucose.

Along with barbaloin, aloes also contains isobarbaloin, B-barbaloin, aloe-emodin and resin. The drug also contains aloetic acid, homonataloin, aloesone, chrysophanic acid, chrysaicid galactouronic acid, choline, choline salicylate, saponins, mucopolysaccharides, glucosamin, mucuronic acid, coniferyl alcohol, etc.

1.11. Uses

Aloes is used as a purgative. Its effect is mainly on colon. It has a stronger purgative action than the series of all crude drugs with anthracene glycosidal content. To counter effect the purgative action, it is given with carminatives.¹⁰

Aloin is preferred now-a-days to aloes, both of which are official. Besides purgative aloes enjoys many other uses. It is an ingredient of compound tincture of benzoin (Friar's balsam)

Aloe gel, formed in inner parenchymal cells of the leaf, is a slightly viscous and clear liquid. During collection, it should not get contaminated with aloe juice. Such gel is used in topical therapeutic applications and also in many cosmetic products, but the therapeutic value, if taken orally, is questionable. The gel possesses good moisturizing properties and also has formulation to form oil in water (approved by U.S.F.D.A.) preparation. It shows anti-inflammatory properties due to the chemical contents like salicylates, carboxypeptidases (inactivating bradykinin) and magnesium acetate (interfering with the conversion of histidine to histamine in the mast cells). The polysaccharide and sugar content have the role for hydrocolloid dressing and also osmotic astringents. Aloe gel also increases the removal of dead tissue due to its astringent content which stimulates macrophage production. It is believed that only fresh gel probably has a role in treatment, burns and wounds.¹¹

It is also used in the treatment of pains and itching and also to slow down ulceration and dermatitis, Aloe gel is used in skin cosmetics as a protective due to its anti-wrinkle properties. so used externally for painful inflammation.¹² Following table distinguishes both the products suitably.¹³

2. Materials and Methods

2.1. Material

Neem Leaves, Aloe vera leaves, sodium lauryl sulphate, glycerine, rose oil and Methyl Paraben.¹⁴

2.2. Method

2.2.1. Extraction of neem

1. Fresh neem leaves are collected and shed dried for 15 days
2. The dried leaves then powdered using mortar and pestle

- The powered neem leaves are weighed 25gm and macerated in a beaker using 100ml of methanol.
- The prepared mixture is kept covered with aluminium foil and kept for 3 days for maceration while stirring in between, and then the mixture was filtered using a filter paper.
- The excess solvent is evaporated using a Rotary evaporator and then the remaining mixture was dried on a hot water bath.
- The dried extract was collected and kept in desiccator for cooling
- The prepared extract is weighed¹⁵

2.2.2. Formulation of herbal hand wash

Hand wash was prepared by was adding 20 ml filtrate of ethanolic neem extract, in this filtrate 6 gm of sodium luryl sulphate was added, 2 gm of carbopol 934, 40 ml glycerin, 0.3 gm methyl paraben, 5 ml rose oil was added and volume was made up to 100 ml distilled water.

Table 1: Formulation of herbal hand wash

Ingredients	Quantity	Use
Methanolic neem extract	20 ml	Antibacterial and Anti inflammatory properties.
Aloevera Juice	20 ml	Soothing Properties
Sodium luryl sulphate	6 gm	Foaming Agent
Carbopol 934	2 gm	Gelling Agent
Glycerin	40 ml	Moisturizing Agent
Rose Oil	3 ml	Fragrance
Methyl Paraben	0.3 gm	Preservative
Distilled water	q.s	

2.2.3. Evaluation of herbal hand wash

Physical Parametrs

- Appearance:** It was observed visually.
- Color:** It was observed visually
- Odor:** It was observed manually.
- Homogeneity:** It was observed visually.
- Fragrance:** It was based on individual observation for its acceptability. 5 people were asked for acceptability of fragrance and their opinion was taken. And fragrance was evaluated based on the below-described criteria

Fragrance was good, as good as the fragrance of reference hand wash.

Fragrance was not so good but comparable to the reference hand wash.



Fig. 3: Preparedherbal handwash

2.3. Chemical parameters

- pH Determination:** pH was determined by using digital pH meter. 1 gm of formulated hand wash was taken and dissolved in 100 ml distilled water. pH of hand wash was adjusted using 40 % NaoH Solution.
- Viscosity:** The viscosity was determined by using digital Brookfield viscometer.
- Foam Height:** 0.5gm of sample of Herbal handwash was taken and dispersed in 25 ml distilled water. Then, transferred it into 500 ml stoppered measuring cylinder; volume was make up to 50 ml with water. 25 strokes was given & stand till aqueous volume measured upto 50 ml & measured the foam height; above the aqueous volume.
- Foam Retention:** 50 ml of the Herbal hand wash was taken into a 200ml graduated cylinder & shaken 10 times. The volume of foam at 1-minute intervals for 4 minutes was recorded.

3. Result

4. Conclusion

The neem extract herbal handwash was successfully developed with antibacterial properties and enhanced quality with aloevera juice as soothing agent, carbopol 934 as gelling agent. Sodium luryl sulphate as surfactant, glycerine as moisturizing agent, Rose oil for fragrance. The formulated hand wash was evaluated for different parameters like pH, color, foaming efficiency, viscosity and stability. The hand wash was found to be stable in terms of

Table 2: Results of all evaluation parameters

S.No	Evaluation Parameters	Result
1.	Appearance	Opaque
2.	Color	Light Green
3.	Odor	Aromatic
4.	Homogeneity	Homogenous
5.	Fragrance	Rosy
6.	pH Determination	6.0
7.	Viscosity	28 c Pascele
8.	Foam Height	5 cm
9.	Foam Retention	20 min

physical parameters with good cleansing property.

5. Acknowledgment

I am thankful to the management of BM College of Pharmaceutical Education and Research, Indore for providing all the necessary thing to carry out my research work and heartily thankful to our principal Dr. Dharmendra Solanki for providing all the support and encouragement to carry out my research work.

6. Source of Funding

None.


7. Conflict of Interest


None.

References

- Mahetre GD, Jaya P, Amphore RS, Sachin D. Consise Course in Cosmetic Science. vol. 2021. and others, editor. S. Vikash and Company medical publisher;. p. 203–4.
- Pallai DR, Chandrashekar K, Nayak D, Banu A, Kumar P, Pai V, et al. Development and evaluation of Herbal hand wash with Neem Alcoholic Extract. *Res J Pharm Tech.* 2021;14(1):308–10.
- Kaur H, Kaur J. Hand Hygiene Practices among Staff Nurses during Drug Administration at Selected Tertiary Health Care Centre of Ludhiana, Punjab. *Asian J Nur Edu Res.* 2015;5(2):199–201.
- kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 56th ed. and others, editor. Nirali prakashan; 2019. p. 19.
- Kavitha T. A Study to assess the Knowledge regarding Hand Hygiene among Staff Nurse in Wockhardt Hospital Rajkot, Gujarat State. *Asian J Nurs Educ Res.* 2018;8(3):333–4.
- Ghotkar NM, Kharade SS, Chavan RS, Jadhav RS, Jagtap NM, Vambhurkar GB. Formulation and Evaluation of Herbal Facewash for Acne. *Asian J Pharm Ana.* 2018;8(4):183–5.
- Power PV, Bhandaul. Formulation and Evaluation of Poly Herbal anti-Bacterial Gel Based Hand wash. *Int Pharm Sci Rev Res.* 2014;33(1):79–82.
- Ravi K, Pratibha MD, Kolhapure SA. Evaluation of the antimicrobial efficacy and safety of Pure Hands as a hand sanitizer. *Indian J Clin Pract.* 2005;15(10):19–27.
- Natarajan SB, Shah MA. Formulation Evaluation and Antibacterial Efficiency of Herbal Hand Wash Gel". *Int J Pharm Sci.* 2014;23:120–4.
- Choudhari S, Sutar M. Evaluation and antibacterial Efficiency of Herbal Hand Wash. *Indo Am J Pharm Res.* 2014;23:120–4.
- Mahesh B, Satish S. Antimicrobial Activity of Some Important Medicinal Plant against Plant and Human Pathogens. *World J Agricultural Sci.* 2008;4:839–43.
- Patel D, Shah P, Managoli N. Evaluation of In-vitro Anti-oxidant and Free Radical Scavenging activities of Withania somnifera and Aloe vera. *Asian J Pharm Tech.* 2012;2(4):143–7.
- kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 56th ed. and others, editor. Nirali prakashan; 2019. p. 9.
- Minakshi G, Joshi D, Kamat SD. 4.Minakshi G Joshi, D V Kamat* and S D Kamat Evaluation of herbal handwash formulation Natural Product Radianc, 2008; 7(5): 413-414. *Nat Prod Radianc.* 2008;7(5):413–5.
- Mounika A. Formulation and evaluation of herbal hand wash Containing essential oil. *Int J Creat Res Thoughts .* 2017;6(4).


Author biography

Komal Tikariya, Assistant Professor  <https://orcid.org/0009-0008-1893-5505>

Arpit Gawshinde, Assistant Professor  <https://orcid.org/0009-0007-5062-9455>

Ali Dabeer, Assistant Professor

Sonu Mishra, Assistant Professor

Umesh K. Atneriya, Associate Professor  <https://orcid.org/0000-0003-2402-6048>

Dharmendra Solanki, Professor  <https://orcid.org/0000-0001-7093-5985>

Cite this article: Tikariya K, Gawshinde A, Dabeer A, Mishra S, Atneriya UK, Solanki D. Formulation and evaluation of herbal hand wash using neem and aloe vera extract. *Indian J Pharm Pharmacol* 2023;10(2):89-93.