



**International Journal of Biology, Pharmacy  
and Allied Sciences (IJBPAS)**

*'A Bridge Between Laboratory and Reader'*

[www.ijbpas.com](http://www.ijbpas.com)

---

## FORMULATION AND EVALUATION OF BODY LOTION FROM BEESWAX

TIRTH THAKER\*, KRUPA PADARIYA, BHOOMIKA PATEL AND ANKITA  
PADHIYAR

Department of chemistry, Parul Institute of Applied Sciences, Parul University, Waghodia,  
Vadodara-391760, Gujarat, India

\*Corresponding Author: Dr. Tirth Thaker: E Mail: [tirth6582@gmail.com](mailto:tirth6582@gmail.com)

Received 24<sup>th</sup> Nov. 2022; Revised 26<sup>th</sup> Dec. 2022; Accepted 5<sup>th</sup> May 2023; Available online 1<sup>st</sup> Jan. 2024

<https://doi.org/10.31032/IJBPAS/2024/13.1.7745>

### ABSTRACT

The beauty and wellness industries are expanding rapidly in India, thanks to improving lifestyles, rising incomes and more awareness of preventative healthcare. Skin serves as a protective shield against several environmental factors, such as smog, sunlight, radiation, dangerous bacteria and chemicals. The purpose of skincare products is to protect degraded skin and generate therapeutic topical effects when applied to the skin's outermost layers. In addition to improving the skin's ability to protect itself, using good skincare techniques can also improve our appearance. The demand for skin care products has risen dramatically as a result of the world's aging population growth and strong marketing tactics by cosmetic corporations. Furthermore, it has been proposed that a key predictor of how well-off people perceive themselves is their skin's health and appearance. Our skin's afflicted area is typically only influenced locally by skincare products. Moisturizers are used to prepare dry skin and body lotion is used to moisturize the skin.

**Keywords:** Beeswax, Cocoa butter, Coconut oil, Vitamin E oil, Tea tree essential oil,  
Cleansing milk

### INTRODUCTION

Cosmetics are important in today's lifestyle. healthy lifestyle. Organic vegetable  
Natural foods, herbal remedies and natural products are also in high demand. The use of  
healing methods are the best options for a herbal cosmetics in the personal care

industry has grown [1]. Worldwide cultivation of herbal extracts has made them a household brand in the horticulture industry. Because of their dependability, cosmetics using botanical extracts for skin and hair care are quite popular [2]. Herbal cosmetics come in a variety of formulations. In contrast to synthetic goods, which can have a number of negative impacts on human health, the term "herbal" denotes safety. The skin of people is immediately exposed to cosmetic items, which are frequently utilized. Although the skin acts as a barrier for protection, some substances can pass through the skin and become available to the body's systems [3]. Since the skin covers the whole human body and serves as the body's first line of defense against the environment, it must be preserved and kept in good condition. The purpose of a skin lotion is to protect the skin from various environmental factors, including weather and to provide calming effects [4].

### Types of skin

**1. Normal skin:** Normal skin appears matte, feels soft and silky and has a healthy, perfect appearance. It is less prevalent than other varieties and has the fewest skin issues [5].

**2. Dry skin:** Dryness is perceived as a result of changes in the skin that are visual, tactile and sensory in nature. Redness, a dull surface, dry white spots, flakes, cracks and even fissures are a few examples of visual alterations. Touching the skin can also cause

it to feel uneven and harsh. Additionally, there is less frictional resistance [6].

**3. Mixed skin:** Oily skin (large pores, shine, blackheads) on the forehead, jaw, nose and dry skin (flakiness, dullness, fine lines and wrinkles) on the cheeks, jawline and hairline are typical characteristics of mixed skin [7].

**4. Oily skin:** One of the most frequent dermatological issues that individuals experience is oily skin. On the cheeks, forehead, nose and chin, increased pores may also be present, giving oily skin a shiny, greasy appearance. A greasy surface plugged pores and acne can all result from glands producing too much sebum, which causes oily skin [8].

**5. Sensitive skin:** The sensitive skin responds, observes redness, skin is dry, frequently gets rashes, frequently breaks out and sunburns quickly. Skin hypersensitivity to external stimuli is a condition known as sensitive skin [9].

**Benefits of Body Lotion:** The biggest advantage of utilizing body lotion is its ability to moisturize body. It helps to stop chapped, cracked and chafed skin. Our skin is smoothed, moisturized, softened and scented with body creams. Oily skin is perfectly moisturized by body lotion. Compared to body butter and cream, it is lighter. On the arms, neck and legs, lotions are often administered [10].

**Experimental Section:** Body lotion is formulated by using cleansing milk, cocoa

butter, bees wax, vitamin E capsule, tea tree oil and coconut oil.

Table 1: Composition of cleansing milk

INGREDIENT	USES
Milk	Nourishing the skin
Glycerine	it is a moisturizing agent
Turmeric powder	Anti-inflammatory and antioxidant agent

**Formulation of cleansing milk:** 6 mL of milk was added in 10 mL of glycerine with constant stirring by double boiling method. 1 gm of turmeric powder was added in a mixture. The mixture was cool down at room temperature.

Additionally, cleansing milk purifies the skin by eliminating dirt, makeup and pollutants. In comparison to a face wash, it may feel more moisturizing and relaxing, which helps you and your skin feel cleaner and more refreshed.

The first natural products based on substances like essential oils, which served to cleanse the skin as well as hydrate and nourish it, appeared after the first makeup remover milk. Products with a range of packaging and textures, like makeup removal wipes and biphasic lotions made of both water and oil, started to develop at the beginning of the twenty-first century (Table 2) [11].

Table 2: Composition of body lotion

INGREDIENT	USES
Cleansing milk	Nourishing and moisturizing agent
Beeswax	A protective barrier on the skins surface
Coco butter	Moisturized the skin
Coconut oil	Emulsifier
Vitamin E	Antioxidant
Tea tree essential oil	Reducing itching and irritation

**Synthesis of body lotion:** Body lotion formulated by melting 2 gm of Beeswax with 25 gm of Cocoa butter. 15 mL of Coconut oil and 3 capsules of Vitamin E added. 2gm of cleansing milk and 1 mL Tea tree essential oil added for fragrance. The mixture was moulded at room temperature. 40 gm body lotion obtained.

**(a) Determination of melting point:** By adding the product to a glass capillary and

monitoring the temperature as the item is melted. Melting point 59 °C found.

**(b) Determination of pH:** A pH meter was used to determine the pH of the body lotion. The pH of the sample, which was made up of 1 gram of sample and 100 ml of water, was measured and found 6.96.

**(c) Determination of stability:** 2 gm of formulated body lotion kept at 5-10 °C and

25-35 °C (RT) for 3 months and check weight (Table 3).

(d) **Organoleptic characteristics:** The color, odor and appearance of the body lotion were examined (Table 4).

Table 3: Stability study of formulated body lotion

S. No.	After	Weight of bod lotion	
		at 5-10°C	at 25-35°C
1.	1 month	2.02	2.02
2.	2month	2.01	1.99
3.	3month	2.02	1.99

Table 4: Organoleptic characteristics of formulated body lotion

Sr no.	Product name	Colour	Odour	Appearance
1.	Body lotion	Yellow	Pleasant	Soft, Smooth

(e) **Saponification process:** 2 gm of body lotion was placed in a 250 ml flask then added 25 mL of 0.5 N Alcoholic KOH solution was then a mixture is refluxed using a water condenser on a water bath for half an hour. the resulting solution is cooled and titrated against 0.5 N HCl solution adding 2-3 drops of phenolphthalein indicator used. the x ml of acid required is noted. An exactly identical blank experiment is performed. y ml of HCl required is noted.

**Formula:**

**Saponification value** =  $(yRBF - xRBF) \times$   
**molecular Wt. of KOH = 129 mg**

(f) **Determination of Acid value:** 2 gm body lotion was placed in a 250 ml flask and heated in 25 ml ethanol until dissolved. the mixture was cooled and 2-3 drops of phenolphthalein indicator solution were added. The hot solution was titrated with 0.1 N methanolic potassium hydroxide and a permanent, faint red-white color was obtained.

**Formula:** **Acid value**=  $x \text{ ml of } 0.1N \text{ KOH} \times$   
**Equivalent weight of KOH = 89.6 mg**

(g) **Antimicrobial Activity:** Using cultures of the organisms that were 24 hours old, the antibacterial activity of the organisms was evaluated. The nutrient agar medium plates were created using 15 to 20 ml of nutrient agar media and 90 cm sterile Petri dishes. The plates were contaminated with 0.1 percent inoculums after they had solidified for five to ten minutes. For the agar disc diffusion process, agar discs with a diameter of 5 mm were created using No. 1 Whatman filter paper or newspaper and sterilized in an autoclave. The discs were then filled with varied sample concentrations. The plates were then kept at 37°C for an additional 24 hours of incubation. The plates were left to stand for 30 minutes before being incubated at 37°C for 24 hours. The inhibitory zone's mm-diameter was used to measure the antibacterial activity against *Bacillus subtilis* (gm +Ve) and *Escherichia Coli* (gm -Ve) strains. By assessing the zone of

inhibition against the test pathogens, antimicrobial activity was assessed [12, 13].

Table 5: Antimicrobial activity

Sample	Zone of inhibition (in mm)	
	<i>Bacillus subtilis</i>	<i>Escherichia coli</i>
Formulated Body Lotion	15	12
Standard - Ampicillin	8	6

Table 6: Costing of Body Lotion

Sr no.	Ingredient	Amount	Price/100gm	Quantity	Price
1	Beeswax	100gm	150rs	2gm	3rs
2	Cocoa butter	100gm	225rs	25gm	56.25rs
3	Coconut oil	100ml	42rs	15ml	6.3rs
4	Vitamin E	10 capsules	33rs	3 capsules	9.9rs
5	Cleansing milk	57ml	38rs	2ml	1.33rs
6	Tea tree essential oil	15 ml	250rs	1ml	16.66rs
Total					93.44rs

Table 7: Comparison of body lotion with market price

Name of body lotion	Price	gm
Body lotion	93.44rs	40gm
Vaseline body lotion	156rs	40gm
Lakme body lotion	550rs	40gm
Maybelline body lotion	460rs	40gm
Dove body lotion	259rs	40gm
Himalaya body lotion	140rs	40gm

Table 8: Result and discussion

S. No.	Evaluating parameters	Body lotion
1.	Melting point	59 °C
2.	pH	6.96
3.	Color	Yellow
4.	Odor	Pleasant
5.	Appearance	Soft, smooth
6.	Saponification value	129 mg
7.	Acid value	89.6 mg

## CONCLUSION

The demand for cosmetics created with natural ingredients has been seen to be extremely significant and gradually increasing. In the winter from the cold and in the summer from too the sun, skin can get dry. Body lotions are used to cure dry skin since it consistently has a moisture content. The body lotion that was made had a biologically suitable pH. Since dry skin treatment calls for consistent moisture content values, they are essential. These all contribute significantly to the success of a

new formulated body lotion. Looking towards costing of our formulated body lotion, it has a great commercial scope.

**Acknowledgment:** The authors are thankful to Dr. Devanshu Patel, President, Parul University, for providing necessary infrastructure.

## REFERENCES

- [1] V. P. Kapoor. Herbal cosmetics for skin and hair care. Natural Product Radiance 4, 2005, 306-314.
- [2] S. K. Gediya R. B. Mistry U.K Patel M Blessy H N. Jain Herbal plants:

- Used as a cosmetic. *J. Nat Prod. Plant Resour* 1, 2011, 24-32.
- [3] L.J. Loretz, A.M. Api, L.M. Barraja, J. Burdick, W.E. Dressler, S.D. Gettings, H. Han Hsu, Y.H.L. Pan, T.A. Re, K. J. Renskers, A. Rothenstein, C.G. Scrafffford C. Sewall. Exposure data for cosmetic products: lipstick body lotion and face cream. *Food and Chemical Toxicology* 43, 2005, 279–291.
- [4] Navindgikar N. N., K. A. Kamalapurkar P. S. Chavan Formulation and Evaluation Of multipurpose. Herbal Cream *International Journal of Current Pharmaceutical Research* 12 (3), 2020, 25-30.
- [5] Rachael A. Clark\* Benjamin Chong† Nina Mirchandani‡ Nooshin K. Brinster§ Kei-ichi Yamanaka Rebecca K. Dowgiert\* and Thomas S. Kupper. The Vast Majority of CLA T Cells Are Resident in Normal Skin. *J Immunol* 176, 2006, 4431-4439.
- [6] Leveque JL Grove GL de Rigal Jetal Biophysical characterization of dry facial Acknowledgments skin. *J Soc Cosmet Chem* 82, 1987, 171.
- [7] Naohiro Hatc home MD; Setsuya Aiba MD; Taizo Kato MD; Wakio Torinuki MD; Hachiro Tagami MD; Possible Functional Impairment of Langerhans' Cells in Vitiliginous Skin. *arch Dermatol, jam* 123, 1987, 51-54.
- [8] Liu Shuo MD, Yang Ting MD, Wu KeLun MD, Zhao Rui MD, Zhao Rui MD, Wang Hang MD, Efficacy and possible mechanisms of botulinum toxin treatment of oily skin. *J Cosmet Dermatol* 18, 2019, 451-457.
- [9] E. Berardesca M. Farage and H. Maibach. Sensitive skin: an overview. *International Journal of Cosmetic Science* 1, 2012, 1468-2494.
- [10] Sharmila Dusi, J. Saminathan. Formulation and Evalution of Aloe vera and Dacus Carota herbal cream. *International Journal of Pharmacy Research and Technology*, 10, 2020, 31-36
- [11] Leche desmaquillante: una alternativa natural para el cuidado y limpieza de la piel *Cleansing milk: a natural alternative for skin care and cleansing. Centrosur: April - June 2021, e-ISSN 2706-6800.*
- [12] Runyoro D, Matee M, Olipa N, Joseph C, Mbwambo H. Screening of Tanzanian medicinal plants for anti-Candida activity. *BMC Complement Altern Med.* 6, 2006, 11.

- [13] S Priya Joy and Dr. D. Patric Raja,  
“Anti-Bacterial Activity Studies of  
*Jasminum grandiflorum* and  
*Jasminum sambac*”, *Ethnobotanical  
Leaflets* 12, 2008, 481-483.