IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

A Review - Formulation and Evaluation of Herbal Deodorant Rollon

Kadam Shraddha Sajjan[1], Galande Pradhumn Dattatray[2], Kodalkar V.N.[3], Waghmare P.P.[4], Dr. Potnuri Naga Raju[5]

[1-2]Student of Bachelor of Pharmacy
[3,4]Assistant Professor (Department of Pharmaceutical Chemistry),
[5]Principal and Professor
Mandesh Institute of Pharmaceutical Science and Research Center, Mhaswad, India
kadam.shraddha202@gmail.com, galandepradhumn@gmail.com

Abstract: *The present study focuses on the formulation, development, and evaluation of an anti-microbial herbal deodorant stick prepared using natural ingredients known for their anti-microbial and deodorizing properties.*

Bromhidrosis, also known as axillary osmidrosis, is a condition characterized by unpleasant body odour caused when skin bacteria break down sweat secretions. Microorganisms such as Staphylococcus hominis, Corynebacterium species, and Cutibacterium species play a major role in producing this odour. Herbal ingredients possess significant anti-microbial, deodorizing, and skin-friendly properties that make them suitable alternatives to synthetic deodorants. Natural agents such as clove oil, cinnamon oil, tea tree oil, neem extract, and turmeric exhibit strong anti-bacterial activity and help reduce microbial growth responsible for body odour. In addition, these herbal ingredients provide a pleasant aroma and help in masking unpleasant underarm smell naturally.

The present work aims to formulate a safe, effective, and eco-friendly herbal deodorant stick and to evaluate its various physicochemical and performance parameters such as appearance, pH, spreadability, consistency, stability, anti-microbial activity, and fragrance retention. The study emphasizes the potential of herbal ingredients as natural alternatives for personal hygiene and odour control products. Herbal deodorants are natural formulations designed to control body odor by reducing the growth and activity of odor-producing bacteria present in the apocrine glands. Synthetic antibacterial agents such as triclosan may cause harmful health effects with prolonged use; therefore, herbal alternatives are gaining importance due to their safety and therapeutic benefits. In the present study, a herbal deodorant stick was formulated using sunflower wax, olive oil, castor oil, champaka oil, and chamomile oil. These ingredients were selected for their antibacterial, moisturizing, soothing, and skin-protective properties. Chamomile oil and sunflower wax particularly contributed to the antimicrobial activity and structural stability of the formulation. The prepared herbal deodorant sticks were evaluated for various physicochemical parameters including appearance, pH, softening point, breaking strength, spreadability, stability, and antibacterial activity using standard evaluation methods.

Keywords: Deodorant, Herbal, Odor, Cosmetics, deodorant roll-on, body odour.

I. INTRODUCTION

Cosmetics can be generally described as a wide range of products created to improve, modify, or preserve the beauty and health of the skin, hair, nails, and overall body appearance. These products include everything from simple hygiene and skincare items to decorative makeup products that help individuals express themselves and improve their appearance. Herbal cosmetics are natural and plant-derived products used to enhance and protect the skin while supporting its health and wellness. Historical findings show that humans have used pigments and cosmetic materials for

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 8, May 2026 Impact Factor: 8.2

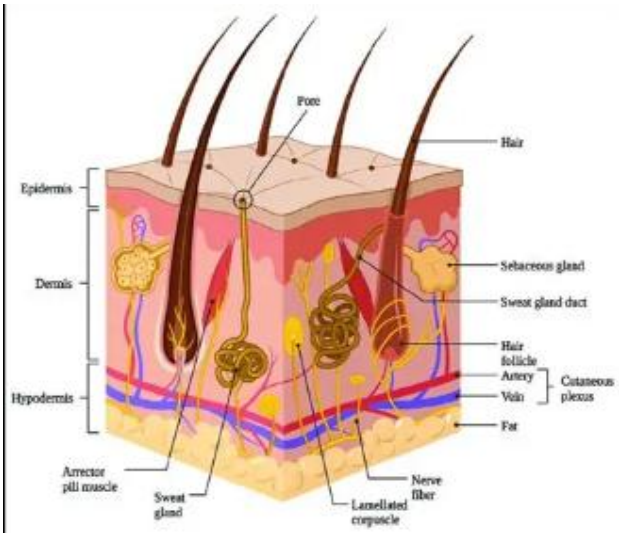
nearly 100,000 years for body decoration and artistic purposes. In ancient civilizations, cosmetics played an important role in daily routines and were also used to reduce or mask unpleasant body.

The successful creation of a commercial pharmaceutical product begins with the discovery of a new drug molecule and continues through formulation development. Formulation scientists are responsible for selecting the most suitable method for delivering the drug according to patient requirements. They also improve and adjust the formulation by considering factors such as bioavailability, stability, and manufacturing processes. This process is highly challenging, as only a small percentage of drug candidates developed during preclinical studies eventually reach the market. Due to the increasing cost of pharmaceutical research and the need for faster drug development, pharmaceutical companies are focusing on improving the process of selecting effective formulations. Generic drug manufacturers also face similar difficulties, especially in the development of complex formulations. A large opportunity still exists in the market for advanced generic medicines. Today, it is widely recognized that a proper understanding of the physicochemical characteristics and microstructure of complex dosage forms, along with regulatory guidance, plays a vital role in achieving successful product development. Deodorant sticks are commonly used to control unpleasant body odor.

These products are prepared by blending active ingredients with substances such as waxes, oils, and silicones, which are then molded into a solid stick form. Body odor mainly develops in the underarm area because this region contains a large number of sweat glands. Sweat itself is odorless when released, but it contains natural fatty substances called lipids that promote the growth of bacteria present on the skin surface. These bacteria break down the lipids into compounds that produce a characteristic sweaty smell. One such compound responsible for body odor is isovaleric acid.

Body odor can be reduced through several approaches, including maintaining proper personal hygiene by regular washing with soap and water, using fragrances, applying antiperspirants, or combining these methods. Deodorants and antiperspirants work differently to control odor. Deodorants mainly help by masking unpleasant smells with fragrance and by creating conditions that limit the growth of odor-causing bacteria. In contrast, antiperspirants reduce sweating by blocking sweat pores, thereby decreasing the moisture available for bacterial activity. In recent years, natural and herbal deodorants have become increasingly popular in the cosmetic and fashion industries due to the growing preference for plant-based and chemical-free products.

- **Skin:**
- **Defination**: Skin is the largest protective outer organ of the body that covers internal tissues and protects them from injury, infection, and water loss.



IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

Layers of Skin:

1. Epidermis
2. Dermis
3. Hypodermis

1. Epidermis:

The epidermis is the outermost layer of the skin. It protects the body from harmful microorganisms, chemicals, and water loss. This layer does not contain blood vessels and receives nutrients from the dermis.

Layers of Epidermis

a) Stratum Corneum

Outermost protective layer

Made up of dead keratinized cells

Prevents water loss and protects from infection

b) Stratum Lucidum

Thin transparent layer present mainly in palms and soles

Provides extra protection

c) Stratum Granulosum

Contains granules rich in keratin

Helps in waterproofing the skin

d) Stratum Spinosum

Gives strength and flexibility to the skin

Contains living cells connected by desmosomes

e) Stratum Basale (Germinativum)

Deepest layer of epidermis

New skin cells are continuously produced here

Contains melanocytes responsible for skin color

2. Dermis:

The dermis lies below the epidermis and is thicker than it. It contains connective tissues, blood vessels, nerves, hair follicles, and glands.

Functions of Dermis

Provides strength and elasticity

Nourishes the epidermis

Regulates body temperature

Layers of Dermis

a) Papillary Layer

Upper thin layer

Contains capillaries and nerve endings

b) Reticular Layer

Deeper and thicker layer

Rich in collagen and elastic fibers

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

3. Hypodermis (Subcutaneous Layer):
This is the deepest layer located beneath the dermis. It is mainly composed of fat and connective tissue.

Functions of Hypodermis:
Stores fat as energy reserve
Provides insulation and maintains body temperature
Protects internal organs from injury
Connects skin to muscles and bones

Functions of Skin
Protection from pathogens and UV radiation
Regulation of body temperature
Sensation of touch, pain, heat, and cold
Excretion of sweat
Synthesis of Vitamin D
Prevention of water loss

What is deodorant ?

A deodorant is a cosmetic and personal hygiene product used to control or conceal unpleasant body smell produced due to bacterial activity on sweat-prone areas of the skin. These products mainly work by reducing odor-causing microorganisms and providing a pleasant fragrance that helps maintain freshness and confidence throughout the day.

❖ **Ideal Properties of Deodorant:**

- Should effectively control or prevent body odor.
  Should possess pleasant and long-lasting fragrance.
- Must be non-irritating and safe for skin.
- Should be non-toxic and non-allergic.
- Must dry quickly after application.
- Should not stain clothes.
- Must have good spreadability and smooth texture.
- Should remain stable during storage.
- Must be free from microbial contamination.
- provide long-lasting freshness.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 8, May 2026 Impact Factor: 8.2

❖ **Body Odour:**

Body odour is mainly produced when bacteria present on the skin break down substances released through sweat, especially in the underarm region. Sweat itself is generally odorless, but microbial activity converts sweat components into compounds that create an unpleasant smell. Several factors such as genetic makeup, personal hygiene, environmental conditions, age, gender, stress, temperature, and cosmetic usage can influence the intensity of body odour.

The skin, which is the body's largest protective organ, acts as a barrier between the internal body and the external environment. Variations in skin bacteria, along with differences in sweat production and secretion consistency, play an important role in determining individual body scent. Grooming habits and the application of cosmetic products may also modify the bacterial population on the skin, thereby affecting odour formation.

Advantages of Herbal Deodorant Stick

1. They also allow for healthy sweat function, unlike aluminium-based synthetics that block pores.
2. Natural deodorants provide It effective odour control using antimicrobial agents like tea tree oil prevents the formation of the bacteria that causes body odour.
3. Deodorants are fragranced to conceal the smell produced by bacteria.
4. They effectively prevent sweating because the aluminium found in most deodorants interacts with sweat to form a blockage in the sweat glands.
5. These blockages reduce moisture, which in turn decreases the likelihood of bacteria developing.

Disadvantages of deodorant stick:

1. Skin Sensitivity
2. Residue and White Marks
3. Allergic reactions
4. Darkening of underarm skin
5. .Blocks sweat glands

Drug profile:

Sr.no	Ingredient	Role	Example
1	Active Ingredients	Antibacterial, Anti persistent	Clove oil , Cinnamon oil, Tea tree oil .
2	Waxes	Providing structure ,	Bees wax , Candelilla Wax
3	Butters	Moisturizer , base for solid formulation	Moisturizer , base for solid formulation
4	Essential Oils	Soothing effect , base and texture , moisturizing,	Coconut oil , Sunflower oil , Castor oil
5	Fragrance	Mask body odour with pleasant scents	Rosemary oil , Lavender oil , Lemon peel oil
6	Emollient	Soft skin	Aloe

❖ **Pharmacogancy:**

1.Clove:

- **Biological name:** Syzygium aromaticum
- **Family:** Myrtaceae

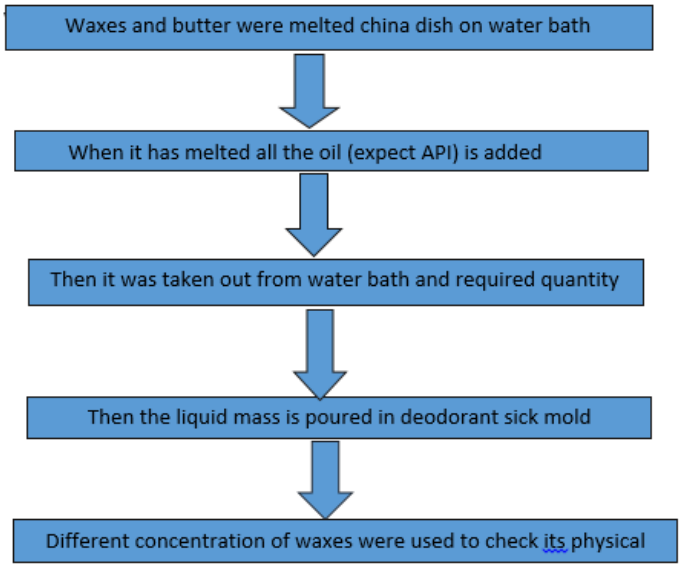
IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

- **Common name:** Clove (Lavang)
- **Chemical constituents:** Eugenol, Eugenyl acetate, β-caryophyllene, tannins, flavonoids, volatile oil
- **Uses:** Antiseptic, toothache relief, antibacterial, antifungal, carminative, flavoring agent, cough and cold preparations

2.Beeswax:

- **Biological name:** Apis mellifera
- **Family:** Apidae
- **Common name:** Beeswax
- **Source:** Obtained from honeycomb of honey bees
- **Chemical constituents:** Myricyl palmitate, cerotic acid, hydrocarbons, esters
- **Uses:** Ointments, creams, cosmetics, candles, stiffening agent

3.Butter:
Biological name: Theobroma cacao
Family: Malvaceae
Common name: Cocoa butter
Source: Fat obtained from seeds of cocoa
Chemical constituents: Oleic acid, stearic acid, palmitic acid, triglycerides
Uses: Suppositories, creams, ointments, cosmetics, moisturizer



Method of Prepration:

❖ **Evaluation Tests of Deodorant Stick:**

1.Appearance Test
Check color, odor, texture, and uniformity of the deodorant stick.

2.pH Test
Measure pH to ensure skin compatibility.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

3. Melting Point Test
Determine the temperature at which the stick melts.

4. Spreadability Test
Evaluate ease of application on skin.

5. Hardness Test
Check firmness and resistance to breakage.

❖ **Applications of Deodorant Stick:**

1. Prevents body odor caused by sweat.
2. Provides long-lasting freshness.
3. Reduces growth of odor-causing bacteria.
4. Absorbs excess moisture and sweat.
5. Gives pleasant fragrance to the body.
6. Improves personal hygiene.
7. Easy and convenient to apply.
8. Suitable for daily use.
9. Helps maintain dry underarms.
10. Used in cosmetic and personal care products.

❖ **Conclusion:**

The present study successfully focused on the formulation and evaluation of an antimicrobial herbal deodorant stick using natural ingredients with proven antibacterial and anti-persistent properties. Herbal agents such as clove oil, cinnamon oil, and tea tree oil effectively inhibit the growth of odour-causing microorganisms like Staphylococcus aureus, E. coli, and Bacillus subtilis, thereby reducing body odour without the side effects associated with synthetic deodorant.

The formulated herbal deodorant stick containing Chamomile oil, Sunflower wax, Olive oil, Castor oil, and Champaka oil exhibited excellent stability, smooth spreadability, and convenient application characteristics, making it a promising natural alternative to synthetic deodorants. Among the developed formulations, DS1, DS2, and DS3 were successfully evaluated for their physical parameters and antibacterial activity.

REFERANCES

1. S K Chaudhri, N K Jain. History of Cosmetics: ancient times, modern. Dr. H. S. Gour Vishwavidyalaya, Sagar - 470 003, Madhya Pradesh, India. Asian Journal of Pharmaceutics - July September 2009.
2. Hardik B. Bhatt, Dr. Nikunj B. Patel. Natural Deodorants: A way towards sustainable cosmetics. Sankalchand Patel University, Visnagar. International Journal of Pharmaceutical Science and Health Care. RS Publication. May.-June.2021.
3. Paweenuch Teerasumran, Eirini Velliou, Shuo Bai, Qiong Cai. Deodorants and antiperspirants: New trends in their active agents and testing methods. Volume 3. University of Surrey, Guildford. International Journal of Cosmetic Science. 21 March 2023.
4. Laila Susanti, Subur Widodo, Qurrota Aini, Dyah Rahmawati. Antibacterial Activity From Cucumber (Cucumis sativus .L) Ethanol Extract In Deodorant Roll On Dosage Form. University Of Tulang Bawang Lampung. International Journal of Pharmaceutical Science. April 2017.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, May 2026
Impact Factor: 8.2

5. Suvarna Ashok Pakhare1, Sakshi Omprakash Jaju, Anand Daulatrao Khendke. Cocoa butter, corn strach and sodium Bicarbonate Infused Roll-on deodorant: A novel approach to Odour control. Volume: 9. Dr.Babsaheb Ambedkar Technological University, Raigad, Lonere. EPRA International Journal of Research and Development. May 2024.
6. Fatemeh Poudineh1, Ania Ahani Azari1, Leila Fozouni. Antibacterial Activity of Ethanolic Extract of Matricaria chamomilla, Malva cylvestris, and Capsella bursa-pastoris against Multidrug Resistant Pseudomonas aeruginosa Strains. Islamic Azad University, Iran. Hamadan University of Medical Sciences. Avicenna Journal of Clinical Microbiology and Infection 30 Mar. 2021.
7. Pradeepa Panneerselvam, Vedha Hari B Narayanan*, Ramya Devi Durai. Pharmacological and Medicinal Potential from Flowers of Perfume Tree M. champaca. Volume 8. Sastra University, Thanjavur, Tamil Nadu, India. International Journal of Pharmacognosy and Phytochemical Research. 15th November, 2016.
8. Maja Molnar, Nikolina Mendešević, Drago Šubarić, Ines Banjari and Stela Jokić. Comparison of various techniques for the extraction of umbelliferone and herniarin in Matricaria chamomilla processing fractions. Chemistry Central Journal. 2017.
9. Hilda Maysarah, Irma Sari1, Meutia Faradilla and Edrina Elfia Rosa. Stick Perfume Formulation from Jeumpa Flowers (Magnolia champaca (L) Baill Ex. Pierre). Universitas Syiah Kuala, Banda Aceh, Indonesia. Research gate Science and Technology Publications. January 2019.
10. Chandrashekhar B. Badwaik, Updesh B. Lade, Tikesh Agarwal, Prachi Barsagade, Madhuri Nandgave, Nilam Gaddamwar. Formulation and Evaluation of Herbal Face Cream. Volume 7. Gondia Maharastra441601, India. International Journal of Pharmaceutical Research and Applications. February 2022.
11. .Elgamal, M. H., &Elnashar, M. M. (2020) Formulation and evaluation of herbal- based deodorants: A review. International Journal of Cosmetic Science, 42(3), 231- 240. https://doi.org/10.1111/ics.12647
12. Nour, R. K.,&Ghaleb, A. M. (2019). Antibacterialand antioxidantactivityofMoringaoleifera extracts: A promising natural alternative in personal care formulations.Journal of Cosmetic Dermatology, 18(4), 1120-1126. https://doi.org/10.1111/jocd.13003
13. .Chaudhary, S. P., &Kaur, R. (2018). Moringaoleifera:Anaturalsource for the developmentof antimicrobial and anti- inflammatory cosmetics. Phytotherapy Research, 32(8), 1467-1482. https://doi.org/10.1002/ptr.6127
14. Dada, S.A., &Fagbohun, O. M. (2021). Formulationof a herbal deodorant: Effects of plant extractsonskinfloraandodourprevention.CosmeticScienceandTechnology,27(2),134-140. https://doi.org/10.1016/j.cosmet.2020.12.005
15. .Moussa,R.S., &Youssef,A.(2017).Evaluationofantimicr obialactivityandstabilityof herbal deodorant formulations. International Journal ofApplied Pharmaceutics, 9(1), 30-36. https://doi.org/10.22159/ijap.2017.v9i1.124 60
16. Rajeswari, R.,&Rajendran,S.(2019). Developmentandcharacterizationofa novelherbal deodorant stick incorporatingplant extracts.Journalof Cosmetic Science, 70(2), 151-160.