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Shea Butter, Lavender Oil and Rosemary Oil Infused Roll on Deodrant-A Novel Approach to Odor Control with Antimicrobial Property

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ABSTRACT:

Deodorants are chemicals that prevent or reduce auxiliary malodor, which results from bacterial breakdown of perspiration from eccrine and apocrine sweat glands. The sweaty odor is caused by the interaction between a variety of substances including low-molecular-weight fatty acids (i.e. caproic, caprylic, isovaleric, butyric), lactates, urea and ammonia, cholesterol, and other steroid compounds. Odor control can be achieved by various means - basic hygiene (washing with soap and water) is the most important but also by antimicrobial agents, antiperspirant, fragrances or any combination of these. Deodorant Roll-on is a topical preparation containing antibacterial from natural ingredients that is used to reduce armpit odor caused by the bacterium Staphylococcus epidermidis. This research study was carried out by opting the Shea butter, Coconut Oil, Sodium bicarbonate, corn starch, Lavender oil, olive oil, rosemary oil, and ghee and chamomile oil. Lavender oil is reported to possess antibacterial activity. Deodorant roll-on were prepared and characterized for physical observation. pH measurement, spread ability, viscosity, drying time, Stability, homogeneity test, skin irritation test. The physicochemical evaluation was obtained.

KEYWORDS: Deodorant, Antibacterial, Corn starch, Sodium bicarbonate, Staphylococcus epidermidis, Deodorant Roll-on stick.

INTRODUCTION:-

Sweat glands produce an odorless secretion, which can be broken down by bacteria into volatile compounds, resulting in body odor. Conventional antiperspirants often contain aluminum compounds, antibacterial agents, and fragrances to control sweat and odor.

However, natural alternatives like crystal deodorants are gaining popularity. Deodorants work by masking or preventing body odor, while antiperspirants reduce sweat production. With daily use by a large population, understanding the impact of deodorants and antiperspirants on skin microbes is crucial.

Sweat Glands and Their Functions

The human skin has three types of sweat glands: eccrine, apocrine, and apoeccrine glands. These glands play a vital role in regulating body temperature and are part of the skin's exocrine function. The skin's structure, comprising the epidermis, dermis, and subcutaneous fascia, provides a mechanical barrier against external factors.

AIM AND OBJECTIVE

AIM: - Shea butter, lavender oil and rosemary oil infused roll on deodorant - a novel approach to odor control with anti microbial property.

Objectives:-

- 1. Prevent body odor: Prevent or mask body odor caused by bacterial breakdown of perspiration.
- 2. Evaluate allergic reactions: Evaluate allergic contact dermatitis from antibacterial deodorants.
- 3. Long-lasting protection: Develop a product that effectively neutralizes body odor for extended periods.
- 4. Antibacterial properties: Incorporate ingredients with antibacterial properties to inhibit the growth of odor-causing bacteria.
- 5. Soothing and moisturizing: Formulate a product that soothes and moisturizes the skin to prevent irritation and dryness.

DRUG PROFILE:-

SHEA BUTTER:



Fig no:01

Shea Butter and the Shea Tree

1. Taxonomical Classification

The Shea tree is classified as follows:

- Genus: Vitellaria
- Species: V. paradoxa (also known as Butyrospermum parkii)
 - Family: Sapotaceae

2. Biological Sources

Shea butter is derived from the nuts of the Shea tree.

3. Uses

Shea butter is used in various applications, including:

- Cosmetics: Shea butter is a popular ingredient in:
- Moisturizers
- Lotions
- Skincare products

Due to its emollient properties and ability to soften and smooth dry skin.

- Food: Shea butter is used:
- In cooking
- In confectionery
- As a fat in the food industry

ROSEMARY OIL:



Fig no:02

1. Taxonomical Classification of Rosemary

- a. Family: Lamiaceae (Mint family)
- b. Genus: Rosmarinus
- c. Species: Rosmarinus officinalis (Rosemary)

2. Biological Sources and Morphological Characters of Rosemary

Source

Rosemary is a perennial shrub that originates from the Mediterranean region but is now cultivated globally.

3. Uses of Rosemary

Culinary Uses

Rosemary leaves are a popular flavoring agent in many dishes, particularly in Mediterranean cuisine. They add a distinctive, aromatic flavor to a variety of foods, including:

- a. Roasted meats
- b. Soups
- c. Stews
- d. Vegetables
- e. Breads

Medicinal Uses

Rosemary has been traditionally used to treat various health issues, including:

- f. Digestive problems: Rosemary is believed to help alleviate digestive discomfort and improve digestion.
- g. Gout: Rosemary has been used to help manage gout symptoms.
- h. Headaches: The herb is thought to help relieve headache pain.
- i. Menstrual issues: Rosemary is traditionally used to increase menstrual flow and alleviate menstrual cramps

LAVENDER OIL:-



Fig no:03

Source and Aroma

Lavender oil is derived from the flowers of the Lavandula angustifolia plant and has a characteristic:

- Scent: Floral, herbaceous, and slightly woody, often described as calming and soothing.

Botanical Name

- Lavandula angustifolia and other Lavandula species and cultivars

Health Benefits of Lavender

Lavender offers a wide range of health benefits, including:

- 1. Anxiety and stress relief: Lavender's calming properties can help reduce anxiety and stress levels.
- 2. Insomnia treatment: Lavender can promote relaxation and improve sleep quality.
- 3. Skin care
- 4. Pain relief:

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5. Respiratory issues: Lavender can help with respiratory problems and clear sinuses.

6. Insect-related issues:

7. Antimicrobial properties: Lavender has anti-bacterial properties, making it effective against various infections.

COCONUT OIL:



Fig no:04

Source

Coconut oil is derived from the kernels of the coconut palm fruit, specifically from the species Cocos nucifera.

Taxonomical Classification

The coconut palm is classified as follows:

- Family: Arecaceae (Palm family)

- Genus: Cocos

1. Culinary Uses: Coconut oil is used for cooking, baking, and frying due to its high smoke point and distinct flavor. It adds richness and texture to various dishes.

2. Cosmetic Uses: In the cosmetics industry, coconut oil is valued for its moisturizing properties. It is commonly used in:

-Skincare products: To hydrate and nourish the skin.

- Haircare products: To improve hair texture and provide hydration.

3. Industrial Uses

other products.

4. Traditional Medicine

5. Nutritional Supplement: Coconut oil is popular as a dietary supplement due to its high content of medium-chain fatty acids (MCFAs), which are metabolized quickly for energy. It is often used by individuals looking to boost their energy levels or support weight management.

OLIVE OIL:



Fig no:05

Olive oil is extracted from the fruit of the Olea europaea tree, a species native to the Mediterranean region.

The oil is a complex mixture, primarily composed of triglycerides, including those of oleic, linoleic, and palmitic acids. It also contains minor constituents like squalene, sterols, pigments, and phenolic compounds, which contribute to its unique flavor, color, and health benefits. Olive oil is widely used in cooking, cosmetics, and some medicinal applications.

Taxonomical Classification:

Family: Oleaceae

Genus: Olea

Species: Olea europaea

Biological Sources

Olive oil is a versatile product with various applications, including:

- 1. Food and Cooking: Health benefits, Flavor profile
- 2. Cosmetics: Emollient properties, Moisturizing effects on skin, Hair strengthening properties

3. Medicinal Application: - Antioxidant properties

GHEE:



Fig no:06

Ghee, a clarified butterfat, is a complex lipid derived from milk, cream, or butter. It's not taxonomically classified like plants or animals, but rather grouped as a food product. Its biological source is animal milk (cow, buffalo, sheep, goat). Ghee's morphological characters include a solid, pale yellow to golden color and a grainy texture. Chemically, ghee is composed of triglycerides, free fatty acids, phospholipids, sterols, and vitamins. It's used in cooking, Ayurvedic medicine.

METHOD AND MATERIAL:-

> Equipment and Materials for Deodorant Roll-On Production:-

The following are necessary for preparing and storing deodorant roll-on formulations:

- 1. Mixing containers: For blending ingredients.
- 2. Precise measuring tools: For accurate ingredient measurement.
- 3. Powdered ingredients: Such as corn starch.
- 4. Heating equipment: Water bath or microwave for melting ingredients.
- 5. Mixing utensils: For thorough blending.
- 6. pH testing device: To ensure optimal pH levels.
- 7. Sterile storage containers: To maintain hygiene and prevent contamination.
- 8. Packaging materials: For storing and distributing the final product.

FORMULA TABLE:-

Sr.no.	Ingredient	F1	F2	Properties
1.	Shea butter	3 gm	4 gm	Antioxidant
2.	Corn starch	2.5 gm	3 gm	Decrease sweat
3.	Rosemary oil	2 ml	1 ml	Decrease sweat, odor and absorb perspiration
4.	Lavender oil	2 ml	4ml	Fragrance, antimicrobial
5.	Coconut oil	7ml	8ml	Moisturizer and odor fighting

Table no: 01	6.	Olive oil	2 drop	2 drop	Hydration
	7.	Ghee	2 drop	3 drop	preservative
	8.	Chamomile oil	1 ml	1.5 ml	Soothing
	9.	Sodium bicarbonate	2 gm	2.5 gm	Antibacterial agent
	10.	Cinnamon oil	2 drop	5 drop	Fragrance

Formulation table

Preparing the Deodorant Roll-On

1. Gather ingredients: Collect all the necessary ingredients, including mogra oil, formaldehyde, sodium bicarbonate, corn starch, cocoa butter, coconut oil, clove oil, castor oil, and fragrance oils (like lavender oil).

2. Mix dry ingredients: Combine sodium bicarbonate and corn starch in a small bowl.

3. Melt cocoa butter: Melt the cocoa butter in a China dish using a water bath. Add coconut oil to the melted cocoa butter.

4. Combine mixtures: Add the dry ingredient mixture (sodium bicarbonate and corn starch) to the melted cocoa butter mixture. Mix well.

5. Add essential oils: Add clove oil, castor oil, and fragrance oils to the mixture. Mix thoroughly.

6. Add preservative: Add formaldehyde as a preservative to prevent bacterial growth.

7. Transfer to container: Pour the deodorant mixture into a suitable container.

8. Pack and labeled it into air tight container.

EVALUATION TEST:-

Physical Evaluation

The physical attributes of the deodorant roll-on formulation were assessed, revealing the following characteristics:

- Color: The formulation exhibited a light yellow hue, which is aesthetically pleasing and indicative of its composition.

- Consistency: The semi-solid consistency of the formulation ensures ease of application and user convenience.

- Odor: The pleasant odor of the formulation enhances user experience and acceptance.

pH Determination

The pH of the formulation was determined using pH paper, which is a crucial parameter in ensuring the product's compatibility with skin pH.

Spread ability

The spreadability of the formulation was evaluated by applying a sample between two glass slides and measuring the time required for the upper slide to move over the lower slide. This parameter is essential in determining the product's ease of application and coverage.

Viscosity

The viscosity of the formulation was measured using a Brookfield viscometer, yielding a result of 0.651 Pas (651 cps) with plastic flow properties. This indicates that the formulation exhibits non-Newtonian behavior, which is characteristic of many personal care products. The viscosity range for the formulation is between 0.25584 and 3.19452 Pas (255.84-3194.52 cps), ensuring optimal application and stability.

Drying Time Test

The drying time test assessed the time required for the formulation to dry after application. The result of 10 seconds indicates that the product dries rapidly, which is attributed to the presence of alcohol. This rapid drying property enhances user convenience and minimizes residue.

Stability Test

The stability test was conducted at room temperature (25°C) and 45°C for two weeks, evaluating the formulation's resistance to: Stability Test

Homogeneity Test

The homogeneity test assesses the uniform distribution of active substances and ingredients within the deodorant formulation. Key findings include:

- Powder deodorant: More homogeneous than roll-on deodorant when stored at room temperature.

- Roll-on deodorant: May exhibit separation when stored at room temperature, but heating with a water bath at 80°C can produce a homogeneous preparation.

- Importance: Ensures even distribution of active substances and ingredients, which is crucial for efficacy and user safety.

Skin Irritation Test

The skin irritation test evaluates the potential for deodorant formulations to cause skin reactions,

such as contact dermatitis. Key considerations includes.

RESULT:

Sr. no	Test	Formulation
1)	Colour	Light yellow
2)	Odour	Pleasant
3)	Consistency	Semisolid
4)	рН	6.3
5)	Spread ability	Easily spreadable
6)	Viscosity	0.643 pa.s (651cps)
7)	Drying time	9-10 min
8)	Stability	Stable
9)	Skin irritation	No irritation

Table no :02 evaluation test result

Product with label :-



Fig no: 08



Fig no: 09

CONCLUSION:-

The formulation of a topical antibacterial herbal deodorant roll-on was developed using cocoa butter, corn starch, and sodium bicarbonate as the primary active ingredients, which are recognized for their antioxidant, anti-inflammatory, antimicrobial, antibacterial, and antiperspirant properties. This deodorant roll-on stick serves as a personal care product designed to minimize sweating and body odor. Consequently, this formulation presents a safe and effective solution for addressing dermatological issues and offers a viable alternative to synthetic antibacterial and antiperspirant deodorants. The preparation demonstrated stability, excellent spread ability, and effectively inhibits the growth of odor-causing bacteria, ensuring a fresh scent.

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