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Formulation and Evaluation of Solid Perfume by Using Rose Extract

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Abstract
Solid perfumes, formulated using a combination of natural waxes, oils, and an essential oils, are popularity as a sustainable alternative to traditional liquid perfumes. It explores the formulation and evaluation of solid perfume by using rose extract, which focus on their physical characteristics, fragrance intensity, and longevity. The solid perfumes were prepared by melting natural waxes and oils, incorporating with essential oils, and allowing the mixture to solidify. Rose oil was extracted from "Rose" by using Soxhlet method. Various tests including organoleptic, homogeneity, spreadability , absorption, irritancy test, pH, acid value, saponification value, and antimicrobial tests, were conducted to assess the quality and performance of the solid perfume. The outcome indicate that the solid perfume has the firm texture, uniform appearance, and suitable melting point for different climates. The formulation demonstrates an effective solid perfume which is eco-friendly and skin-safe.

Index Term- Perfume, Solid perfume, Fragrances, Essential oil.

1. INTRODUCTION:

With a solid composition as opposed to the usual blend of alcohol and water or scent and carrier oil, solid perfumes-also referred to as cream perfumes or solid colognes-offer a distinctive substitute for conventional liquid fragrances. Prestigious perfume companies have started to sell their distinctive fragrances in solid formulations, which are small, waterproof, and portable because of their waxy structure.[1] Solid fragrances the way that consumers view and use scent products has change as a result of developments in cosmetics and perfumery technology. These straightforward yet inventive fragrances have drawn in customers from all around the world, marking a creative shift in the fragrance sector.[2]
The solid perfume market experienced significant growth in 2024, with its global market size valued at approximately USD 1.42 billion. With a compound annual growth rate (CAGR) of 8.74% from 2024 to 2032, projection show that the industry will continue to expand, reaching an extension of USD-1.54 billion in 2025 and maybe USD-2.77 billion by 2032. Overall, the solid perfume market growth in 2024 underscores a broader shift in consumer preferences toward sustainable, convenient, and personalized

fragrance solutions.[3]

History of Solid Perfume Using Rose Extract- The use of solid perfumes dates back to ancient civilization where natural ingredients, including rose extracts, were used to create fragrant balms and ointments. Solid perfumes, made from waxes, resins, and essential oils, were valued for their lasting and intimate scent.

Ancient Egypt (circa 3000 BCE):

The ancient Egyptians pioneered the use of solid perfumes using beeswax, animal fats, and natural resins combined with aromatic substances like myrrh, frankincense, and rose petals. Rose was symbolic of beauty and love.

Ancient Greece and Rome (circa 1000 BCE-500CE): Greeks and Romans adopted Egyptian techniques, using rose extract in solid perfumes as part of daily beauty routines. Rose was associated with the goddesses Aphrodite and Venus.

The Islamic Golden Age (8^{th} to 14^{th} century): The development of distillation by Avicenna enhanced rose oil extraction' popularizing its use in solid perfume as symbol of luxury.

Medieval Europe (5^{th} to 15^{th} century): Solid perfumes with rose extract were valued by European aristocracy, used in pomanders to ward off unpleasant odour.

19^{th} Century to Modern Times: Though alcohol-based perfumes become common, solid perfumes retained their appeal for natural, eco-friendly properties, Today, rose extract solid perfumes blent tradition with modern preferences.[4]

2. PLANT PROFILE:

Rosa Rubiginosa: Rosa rubiginosa is the scientific name of the rose. Roses are flowering plants from the genus Rosa within the Rosaceae family. They are one of the most popular and widely cultivated flowers worldwide, admired for their beauty, fragrance, and symbolism.[5]

3. AIM AND OBJECTIVES:

Aim: Formulation and evaluation of solid perfume by using rose extract.

Objectives:

- To provide a pleasant, long-lasting fragrance to the skin.
- To hydrate and soften the skin, reducing dryness and irritation.
- To protect the skin from environmental stress, such as dry air, wind, and cold weather.
- To provide a portable, easy-to-apply fragrance solution.
- To offer a fragrance that lasts throughout the day without the need for reapplication.
- To provide a solid fragrance that is not subject to the same travel restrictions as liquid perfumes.
- To ensure the solid perfume remains stable and effective over time.
- To guarantee the safety of the user through the use of non-irritating, non-toxic ingredients.[6]

Table No.1- List of Ingredients Required for Solid Perfume Preparation

Sr. No.	Ingredients	Quantity Taken (60g)	Roles
1.	Beeswax	30g	Thickener
2.	Shea butter	30g	Emollient
3.	Coconut Oil	12 drops	Carrier Oil
4.	Raspberry Juice	Few drops	Colouring Agent

5.	Rose Oil	50 drops	Perfuming Agent
6.	Vanilla oil	15 drops	Perfuming Agent

4. MATERIALS AND METHODS:

Raw Materials: The selected materials used to prepare the solid perfume are derived from natural origins. And the formulation of solid perfume requires three main ingredients, these are:

- Bees wax
- Essential oils
- Carrier oils

Figure No.1: Solid Perfume

Figure No.2: Rose

1. Beeswax: By changing the carrier oils condition from liquid to solid, beeswax serves as a barrier to prolong the wear of essential oil-based fragrances.

Figure No.3: Beeswax

2. Shea butter: The nuts of the African shea tree are used to make shea butter, a naturally occurring fat. And it is widely used in cosmetics also in personal care products for its moisturizing and healing properties.

Figure No.4: Shea Butter

3. Coconut oil: Under 25-degree Celsius, coconut oil is white fat; in warmer regions, it is a transparent, thin liquid oil. It has industrial uses as a cosmetic and as a food oil.

Figure No.5: Coconut Oil

4. Vanilla oil: It is an aromatic oil extracted from the beans of the vanilla plant (vanilla planifolia). It is commonly used in perfumery, aromatherapy, and skincare products.

Figure No.4: Shea Butter

5. Rose oil: The petals of the Rosa Centifolia are used to extract this very fragrant essential oil. It is widely used in perfumery, cosmetics, and aromatherapy.

Figure No.7: Rose Oil

6. Raspberry juice is a natural liquid extracted from the fruit of the raspberry plant (Rubus idaeus). It is widely known for its vibrant colour and used in cosmetics also in skincare products.[7]

Figure No.8: Raspberry Juice

5. METHODS USED FOR ROSE OIL EXTRACTION:

"Rose oil extraction using Soxhlet Apparatus"

1. Use tap water to clean and dry all glassware and Soxhlet apparatus components.
2. Put the Soxhlet apparatus together.
3. Weigh 50g of powdered rose flowers, put them in a packet of filter paper, and then put them in the Soxhlet apparatus thimble.
4. Set the heating mantle to 30 degrees Celsius, wet the powder with acetone, and turn on the water inlet.
5. Keep extracting until the powder has a light hue.[8]
6. "Oil separation from solvent Using Separating Funnel"

1. Then transfer all the extraction into the separating funnel.
2. Keep it stable until 2 layers get separated.
3. Hence, rose oil is separated from the aqueous phase.
   Collect it in the container.[9]

6. METHODS OF PREPARATION:

1. Accurately weight all ingredients.
2. Mixture of the shea butter and bees wax is gently heated until both are melted, stir occasionally to ensure a uniform mixture.
3. Once the shea butter and bees-wax are melted, add carrier oil i.e., Coconut Oil.[10]

4. stir well to combine all ingredients thoroughly.
5. Then, remove the mixture from heat and allow it to cool slightly, but not to the point of solidifying.
6. Add essential rose oil based on scent preference and few drops of vanilla oil also.
7. Stir gently to ensure the rose extract is evenly distributed throughout the mixture.
8. For the tint, add few drops of raspberry juice into the mixture and stir until they fully blended.
9. While the mixture is still in liquid form, carefully pour it into the clean container for the solid perfume.
10. Allow the perfume to cool and solidify completely at room temperature before sealing the container.[11]

7. FEATURES OF SOLID PERFUME:

- Alcohol-Free: Solid fragrances are gentler on the skin and don't include irritants like alcohol, in contrast to liquid one.
- Leakage-Free: Solid perfumes are easy to transport and store because they don't leak.[12]
- Long-Lasting: Provides a long-lasting impact by adhering to the skin layer.
- Moisturizing and Nourishing: It Contain oils and moisturizers benefits for dry skin.
- Compact Size: carrying small, sturdy containers is simple.
- Travel-Friendly:Liquids do not ban liquids.[13]

8. EVALUATION PARAMETERS:

Organoleptic Evaluation:

The prepared formulation's colour, texture, appearance, and odour were all determined by an organoleptic evaluation. It was determined that the formulation was acceptable and smooth.[14]

Physical Evaluation:

Homogeneity: Assessed through visual appearance and touch.

Spreadability: Applying a sample to a known region and evaluating the spread allows one to determine spreadability.

Solubility: Verified across many media.

Absorption: Seen in a specific location.

Smear Type: Determined by dabbing the palm with the solid perfume.

Emolliency: Assessed for slickness and post-application residue.

Physical Appearance: Examined visually against a shadowy background.

After Feel: After application, the skin's texture was evaluated.[15]

Ease of Removal: assessed by using tap water to wash.

Irritancy Test: Overa 24-hour period, any allergic reaction or irritation are tracked.

Melting Point: The beaker was filled with 2g of solid perfume. Additionally a beaker was submerged in warm water in a water bath. The melting point of material was defined as the temperature at which a liquid drop formed.

pH: Universal pH paper was used to test the resultant solid scent.[16]

Chemical Evaluation:

Acid value: The quantity of milligram of KOH needed to neutralised 1g of wax is known as the acid value. The unit of measurement is mg KOH/g.[17]

Saponification Value: The saponification value quantifies how much KOH is needed to hydrolysed 1g of wax. The unit of measurement is mg KOH/g.[18]

Ester value: The difference between the acid value and saponification value is known as the ester value.[19]

9. RESULTS:

1. Organoleptic Evaluation.

Sr. No.	Parameter	Observation-on	Inference
1.	Colour	Pink	Pestle Pink
2.	Texture Grade	Smooth	Even formulation and proper blending of ingredients.
3.	Odour	Rosey odour	Smooth and refreshing rosy odour
4.	Visual aspect	Homogenous	Formulation was homogenous
5.	Unevenness'	Not present	Formulation is smooth
6.	Softness	Present	Formulation was Soft
7.	Physical State	Solid	Formulation is Solid

Table no.2-Organoleptic Properties of Solid Perfume

2. Physical Evaluation.

Sr. no.	Parameter's	Observations'	Inferences'
1 .	Uniformity	Firm and consistency	Formulation is uniform.
2 .	Ability to spread	Spread Consistent	Formulation has good spreading -ability.
3 .	Solubility	Water-insoluble	Formulation is both hydrophobic and lipophilic.
4 .	Absorption	Easily absorbs on the skin	Formulation absorbs easily into the skin.
5 .	Smear kind	Greasy	Oils are used in the formulation.
6 .	Emolliency	No residue is seen because of its smoothness	Formulation is consistent and uniform.
7.	Physical visualisation	Opaque	Formulation is not transparent.
8.	Skin felt	Skin felts soft and smooth	Formulation is smooth and firm.
9.	Ease of removal	Cannot be eliminated by the tap water, may require soap/detergent	Formulation contains an oily base.
10.	Irritancy	No irritancy was observed or feel	Formulation is non-irritant
11.	Melting Point	85^0 C	85^0 C
12.	pH	5	5

Table no.3-Physical Assessment of Solid Perfume

3. Chemical Evaluation.

Sr. no.	Chemical Tests	Result
1.	Saponification Value	140.25 mg KOH/g
2.	Acid Value	14.75 mg KOH/g
3.	Ester Value	125.5 mg KOH/g

Table no.4- Chemical assessment for solid perfume

10. CONCLUSION:

The study focused on- formulating and evaluating a solid perfume, containing rose extract. The formulated solid perfume was pestle pink in colour, had a smoothy rosy odour, uniform texture and solid consistency. Evaluation indicated that, a solid perfume feels soft on skin and non-irritant in nature. The solid perfume formulated in this project is a unique and innovative product that combines the benefits i.e. fragrance, moisturizing and convenience. Ingredients like shea butter and carrier oils provide moisture, making it suitable for sensitive skin also. The solid form of a perfume makes it easy to apply and transport, while its natural ingredients ensure that's it is safe and gentle on the skin. The acid and saponification value tests conducted on the product confirm its stability and efficacy Overall, this solid perfume is an excellent alternative traditional liquid perfume, offering a convenient, moisturizing, and fragrant experience i.e. perfect for everyday use.

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