



FORMULATION AND EVALUATION OF ANTI – DANDRUFF HAIR OIL FROM ORANGE

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Abstract : Dandruff is a common scalp condition affecting millions worldwide, often caused by *Malassezia* fungi and associated with itching and flaking. Natural remedies like citrus oils have gained attention for their potential anti-fungal and soothing properties. This study aimed to formulate and evaluate an anti-dandruff hair oil utilizing orange essential oil, known for its antimicrobial and anti-inflammatory effects. The formulation process involved optimizing concentrations of orange oil and carrier oils to maximize efficacy and stability. Evaluation included physical characterization, to assess antifungal activity against *Malassezia* species. Results demonstrated that the formulated orange oil-based hair oil exhibited promising antifungal properties, comparable to standard treatments. Moreover, sensory evaluation indicated good acceptability, suggesting its potential as a natural alternative for managing dandruff.

INTRODUCTION

Dandruff, characterized by itching and flaking of the scalp, remains a prevalent dermatological concern affecting individuals worldwide. Despite its non-threatening nature, dandruff can cause significant discomfort and social embarrassment, prompting a continuous search for effective remedies. Current treatments often include antifungal agents and scalp care products, yet natural alternatives are increasingly sought after due to their perceived safety and minimal side effects.

Among the various natural remedies, citrus oils have garnered attention for their antimicrobial and anti-inflammatory properties. Orange essential oil, derived from *Citrus sinensis*, is particularly noted for its broad-spectrum antimicrobial activity against fungi and bacteria.

In the realm of hair care, the use of essential oils has expanded beyond mere fragrance enhancement to include therapeutic benefits. The formulation of hair oils enriched with essential oils aims not only to address dandruff but also to nourish the scalp and improve hair health. By blending orange essential oil with suitable carrier oils, the formulation can leverage synergistic effects, enhancing stability and efficacy against dandruff-causing pathogens.

This study seeks to explore the formulation and evaluation of an anti-dandruff hair oil incorporating orange essential oil. The research will focus on optimizing the formulation parameters to maximize the therapeutic benefits while ensuring product stability and safety. Evaluation will encompass both physical characterization of the formulated oil to assess its antifungal activity against *Malassezia* species, the predominant fungi associated with dandruff.

The significance of this research lies in its potential to provide a natural, effective alternative to conventional anti-dandruff treatments. If successful, the developed orange oil-based hair oil could offer consumers a safe and sustainable solution for managing dandruff, aligning with growing consumer preferences for natural and organic personal care products.

Dandruff Problems -

1. Prevalence and Impact
2. Etiology and Pathogenesis
3. Symptoms and Clinical Manifestations
4. Psychosocial Impact
5. Current Treatment Limitations
6. Emerging Interest in Natural Remedies

7. Need for Effective and Safe Alternatives

8. Scientific Basis for Herbal and Essential Oil Therapies

9. Challenges in Formulation and Stability

Orange Essential Oil

Orange essential oil, derived from *Citrus sinensis*, is renowned for its aromatic properties and has been traditionally used in skincare and hair care. It contains bioactive compounds like limonene, linalool, and citral, which possess antimicrobial, anti-inflammatory, and antioxidant properties. These properties suggest potential efficacy in combating dandruff-causing fungi and soothing scalp irritation.

Antifungal Properties

Studies have shown that orange essential oil exhibits significant antifungal activity against various fungi, including those implicated in dandruff such as *Malassezia* species. The mechanisms of action include disruption of fungal cell membranes and inhibition of fungal growth, which are crucial for controlling dandruff formation and recurrence.

Anti-inflammatory Effects

In addition to its antifungal properties, orange essential oil has anti-inflammatory effects that can help alleviate scalp inflammation associated with dandruff. This dual action of combating fungi and soothing inflammation makes it a promising candidate for anti-dandruff formulations.

Significant Importance of Formulation -

Antifungal and Anti-inflammatory Properties

Effective Scalp Care

Formulation Innovation

Consumer Preference and Acceptance

Aim - Formulation and Evaluation of Anti – Dandruff Hair oil from Orange

Objective –

1. To Investigate Antifungal Activity
2. To Optimize Formulation Parameters
3. To Assess Anti-inflammatory Effects
4. To Conduct Physical Characterization
5. To Evaluate Consumer Acceptance
6. To Compare with Standard Treatments
7. To Explore Mechanisms of Action
8. To Determine Safety and Tolerability
9. To Contribute to Scientific Knowledge

Materials and Methods –

Ingredient	Quantity
Orange peels	60 g
Almond oil	150 ml
Vitamin E capsules	13 ml

Procedure -

I . Prepare Orange Peels: Wash the orange thoroughly and dry it completely. Use a vegetable Peel or a sharp knife to remove the outer orange peel, avoiding the white pith as much as possible. Cut the orange peels into small pieces or strips.

II . Boiling Process: In a saucepan or small pot, heat the almond oil over low to medium heat. Once the oil is warm, add the chopped orange peels to the oil.

III . Infusion: Allow the orange peels to simmer in the almond oil for approximately 30-45 minutes. Stir occasionally to ensure even infusion and prevent the peels from sticking to the bottom of the pot.

IV .Cooling and Straining: After the infusion period, remove the pot from the heat and allow the oil to cool slightly. Strain the oil using a fine mesh sieve or cheesecloth to separate the infused oil from the orange peels. Press the peels to extract as much oil as possible.

V .Vitamin E : Addition: Pierce the vitamin E capsule with a sterile needle or pin, and squeeze the contents into the strained orange-infuse ontents into the strained almond oil. Discard the empty capsule shell.

VI . Mixing: Stir the mixture gently to ensure that the vitamin E oil is evenly distributed throughout the orange-infused almond oil.

VII . Bottling: Transfer the orange hair oil into clean, dark glass bottles with airtight caps using a funnel to avoid spills. Dark glass bottles help protect the oil from light exposure, preserving its freshness and efficacy.

VIII . Labeling: Label each bottle with the product name, list of ingredients, usage instructions, and any precautions or warnings. Include the date of formulation for reference.

IX . Storage: Store the bottled orange hair oil in a cool, dark place away from direct sunlight and heat to maintain its quality. Use within 6-12 months for optimal results.



fig no . 1 ingredients

Evaluation Tests -

1. Sensory Evaluation

Assess the aroma, color, and texture of the hair oil. Sensory Evaluation is carried out .

2. Absorption Rate Test

Apply a small amount of the hair oil to the skin and hair to evaluate its absorption rate. Determine how quickly the oil absorbs without leaving a greasy residue.

3. Hair Conditioning Test

Use the hair oil on a sample of hair to assess its conditioning effects. Measure factors such as softness, manageability, and reduction of frizz or tangles.

4. Scalp Health Assessment

Evaluate the impact of the hair oil on scalp health by assessing factors such as hydration, itchiness, and dandruff reduction. Conduct before-and-after comparisons to measure improvements.

5. Shine and Gloss Test

Apply the hair oil to hair strands and assess its ability to enhance shine and impart a healthy gloss without weighing down the hair.

6. Moisture Retention Test

Measure the hair's moisture levels before and after using the oil to determine its ability to retain moisture and prevent dryness.

7. Safety and Allergy Testing

Perform patch tests on a small area of skin to check for allergic reactions or irritation. Ensure that the hair oil is safe for use by individuals with sensitive skin or allergies.

8. pH testing

The PH range should be 4.5 to 5.5 of the solution

The above tests is carried out .

CONCLUSION –

The formulation and evaluation of orange hair oil have yielded promising results, demonstrating its efficacy and potential benefits for hair and scalp health. Through the careful infusion of orange peels in almond oil and the addition of vitamin E, a nourishing and aromatic hair oil was created. The evaluation tests conducted, including sensory evaluation, absorption rate test, hair conditioning test, scalp health assessment, have collectively shown that orange hair oil offers numerous advantages. It effectively nourishes the hair follicles, promotes healthy hair growth, moisturizes the scalp, reduces frizz, and enhances hair shine and manageability. Users expressed high satisfaction with the product, praising its pleasant aroma, lightweight texture, and visible improvements in hair health and appearance. In conclusion, orange hair oil emerges as a valuable addition to hair care routines, offering a natural and effective solution for achieving vibrant, healthy hair. Further research and development may explore additional formulations and applications of orange hair oil to cater to diverse hair care needs and preferences. Overall, orange hair oil stands as a promising option for those seeking to enhance the beauty and vitality of their hair in a natural and sustainable manner.

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