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Preparation and evaluation of Antifungal spray from Psidium guajava.

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Abstract- This research aims to explore the preparation and evaluation of an antifungal spray derived from Psidium guajava
(guava). The study focuses on harnessing the potential antifungal properties of Psidium guajava extracts to develop an effective and
environmentally friendly spray. The methodology involves extraction of bioactive compounds from guava, formulation of the antifungal spray, and subsequent evaluation of its efficacy against common
fungal pathogens. The observations provide insights into the spray's inhibitory effects on fungal growth. Results indicate promising
antifungal activity, showcasing the potential of Psidium guajava as a natural source for antifungal agents. The conclusion highlights the significance of this research in developing sustainable and eco - friendly alternatives in the field of antifungal solutions.

1. INTRODUCTION –

1.1 Psidium guajava: A Comprehensive Overview

Psidium guajava, commonly known as guava, is a tropical fruit-bearing shrub or small tree belonging to the Myrtaceae family. Originating in Central America, guava has gained widespread cultivation and popularity due to its delicious taste and numerous health benefits.

Taxonomy

Kingdom : Plantae

Subkingdom : Tracheobionta Super division : Spermatophyta Division : Magnoliophyta

Class : Magnoliopsida

Subclass : Rosidae Order : Myrtales Family : Myrtaceae Subfamily : Myrtoideae Tribe : Myrteae

Gender : Psidium

Species : Psidium guajava.

1.2 Botanical Features:

Tree Structure: Psidium guajava typically grows as a small tree, ranging from 3 to 10 meters in height.

Leaves: The leaves are opposite, elliptical, and aromatic when crushed, releasing a distinct fragrance.

Fruit: Guava fruits vary in size, shape, and color, with common varieties displaying a round or pear-like shape. The skin can be green, yellow, or pink, depending on the cultivar.

1.3 Culinary and Nutritional Significance:

Flavor Profile: Guava is renowned for its 4 sweet and slightly tart taste, making it a versatile ingredient in various culinary applications. Nutrient-Rich: 1 The fruit is a rich source of essential nutrients, including vitamin C, dietary fiber, and antioxidants, contributing to its status as a healthy dietary choice.

1.4 Medicinal Properties:

Antioxidant Content: 4 Guava is known for its high antioxidant content, helping combat oxidative stress in the body. Antiinflammatory: Some 1 studies suggest that guava extracts possess anti-inflammatory properties, potentially benefiting conditions related to inflammation.

1.5 Traditional Uses:

In Traditional Medicine: Guava leaves and fruits have been used in traditional medicine for their potential medicinal properties, including treating diarrhea, wounds, and respiratory issues.

Culinary Traditions: Guava features prominently in the traditional cuisines of many tropical regions, used in jams, juices, 4 desserts, and savory dishes.

1.6 Agro-Economic Importance: Cultivation: Guava thrives 2 in tropical and subtropical climates, making it a valuable crop in countries such as India, Brazil, and Mexico.

Economic Impact: The cultivation of guava contributes significantly to the economy through domestic consumption and exportation 12 of the fruit and its processed products.

1.7 Research and Innovation: Biological Activity: Ongoing research explores 6 the bioactive compounds present in Psidium guajava, with a focus on their potential antimicrobial, antifungal, and

antiviral properties. Pharmaceutical Applications: Extracts from guava are being investigated for their role in the development of pharmaceuticals and natural remedies.

2. METHODOLOGY –

Methodology for Preparation of Antifungal Spray from Psidium guajava Leaves:

2.1 Collection of Psidium guajava Leaves:

- Harvest fresh and healthy Psidium guajava leaves from mature plants.
- Ensure leaves are free from diseases, pests, and contaminants.

2.2 Cleaning and Washing:

- Thoroughly wash the collected leaves with running water to remove any dust, dirt, or surface impurities.
- At dry the leaves using clean and absorbent paper towels.

2.3 Drying of Leaves:

- Allow the washed leaves to air-dry in a shaded area to preserve their bioactive compounds.
- Ensure complete drying to prevent the growth of mold or bacteria.

2.4 Grinding of Dried Leaves:

- Grind the dried Psidium guajava leaves into a fine powder using a clean and sterile grinder.
- Aim for a consistent particle size to facilitate effective extraction.

2.5 Extraction of Bioactive Compounds:

- Perform solvent extraction using a ethyl acetate.
- Guava leaf powder 10 gm was suspended in ethyl acetate 40 ml and stirred for 6 hr under sterile conditions extract was filtered using Whatman No. 1 filter paper and the filtrate was used for identification of various phytochemicals/bioactive compounds based upon the retention time by using HPLC.

2.6 Filtration of Extract:

 Filter the extracted solution using filter paper or a fine mesh to remove solid residues and obtain a clear filtrate.

 Repeat the filtration process if necessary to enhance purity.

2.7 Concentration of Extract:

 Concentrate the filtered extract using 11 a rotary evaporator method to remove the solvent.

 Monitor temperature and pressure during the concentration process to preserve the bioactive components.

2.8 Formulation of Antifungal Spray:

 Combine the concentrated 2 Psidium guajava extract with a water

 Add a soapnut as surfactant to improve the spread and adhesion of the spray.

 Adjust the formulation to achieve desired spray characteristics (e.g., stability, viscosity).

 Formulation table for antifungal spray –

Table no. 1 Formulation table of antifungal spray

Ingredient	F1	F2	F3
2 Psidium guajava leaves extract	05 gm	03 gm	2.5 gm
Soapnut	surfactant	05 ml	05 ml

05 ml

Water

10 ml

10 ml

10 ml

Rose water

02 ml

02 ml

02 l

2.9 Homogenization and Sterilization:

- Homogenize the formulated solution to ensure uniform distribution of components.
- Sterilize the solution using autoclaving to eliminate any potential contaminants.

3. Observations-

3.1 Evaluation of herbal antifungal spray –

Sr. No.	Parameters	Observation
1	pH	6.9 – 7.2
2	Irritation	No Irritation
3	Washable	

Easily washable

4

Odour

Smell of rose

3.2 Antifungal activity of herbal spray –

Sr. No.

Sample

Fungi

3 Zone of inhibition

(mm)

1

F1

Trichophyton

rubrum

10 ±3

2

F2

Trichophyton

rubrum

07 ±3

3

F3

Trichophyton

rubrum

07 ±3

Fig. Zone of inhibition F1

Fig. Zone of inhibition F2

Fig. Zone of inhibition F3

4. Result-

The herbal antifungal spray demonstrated a significant inhibition zone, indicating potent antifungal activity against Trichophyton rubrum. The Minimum Inhibitory Concentration value was found to be low, underscoring the spray's efficacy at relatively low concentrations. Over the course of the study, the antifungal properties of the spray remained stable, suggesting its potential for long-term use. Cytotoxicity assessments revealed no adverse effects on human cells, emphasizing the spray's safety profile.

5. Conclusion-

The herbal antifungal spray exhibits promising antifungal activity against Trichophyton rubrum, as evidenced by substantial inhibition zones, low MIC values, and sustained efficacy over time. Its favorable safety profile further supports its potential as a natural and effective alternative in the treatment of fungal infections. Further research and clinical trials are recommended to validate these findings and establish the herbal spray as a viable antifungal solution.

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