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## Research Article

# Formulation and Evaluation of Herbal Antiseptic Oil from the *Phyllanthus Niruri* Extract

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### ABSTRACT

#### Objective:

The study focuses on the formulation and evaluation of an herbal Antiseptic oil from the *Phyllanthus niruri* extract. This study discusses the preparation of herbal antiseptic preparation for wound-healing activity purpose. In studies, it has shown antibacterial and antimicrobial properties.

#### Methodology:

Traditional extraction methods (Percolation, Decoction, Soxhlet extraction) are used to extract the bioactive compounds from the plant. The ethanolic and aqueous solvent is used to obtain the extract from the plant.

#### Results:

The presence of bioactive compound is evaluated using chemical tests, The Physical parameter (Appearance, pH, Appearance, odour, density, viscosity, TLC) of the formulation are evaluated.

#### Conclusion:

This study concludes the presence of bioactive compounds and physical parametric evaluation study of formulation.

### INTRODUCTION

*Phyllanthus niruri* is a traditional plant. It is a yearly plant and grows in the rainy season in humid areas. In studies, it has numerous therapeutic potential against various diseases. Extracts of plant were used traditionally to cure the disease. The plant is a rich source of Bioactive compounds such as alkaloids, lignans, flavonoids,

terpenoids, phenolic compounds, tannins, and coumarins. Plant have therapeutic potential in the hepatitis b virus, cancer, liver, diabetes, bacterial infection, viral infection, malaria, renal stones, and tuberculosis. Traditionally in India and China, it was used to cure fever, jaundice, liver cancer, and tuberculosis. The plant has synonyms according to the region such as in the Amazon rainforest it's

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named as Chanca Piedra, In China, it is named Zhu zi cao, In India it has various names based on location and language, In Maharashtra, it is known as a bahupatri, in Tamilnadu it found as keela nelli, In Sanskrit, it is known as bhumyاملaki. Traditional and modern methods are used to obtain the extract from Phyllanthus niruri. Methods such as Percolation, maceration, decoction, infusion, Soxhlet extraction, microwave-assisted, supercritical fluid, and enzyme-based extraction methods were used. (Pasaribu, 2021) Based on part of the plant (leaves, root, bark, whole plant, stem) extraction was extracted. Each part as a therapeutic potential such as leaves and stems used as ink and as dyeing color. Whole plant extract is used in treatment of cough, diabetes mellitus, and inflamed eyes. Root extract is used in the scalp, fever, and jaundice. Additionally, it has cooling, carminative and laxative properties. (Bagalkotkar, 2010)

### **Formulation Methodology**

Ingredients and Equipments - Phyllanthus niruri plant, Solvent(Ethanol, Water), Essential Oils(Clove oil, Peppermint oil, Eucalyptus oil, Coconut oil), Lavender oil, Preservatives and Vitamins. Extraction equipments (Percolator, soxhlet extractor, Heating mantle, glasswares.

### **Formulation Preparation -**

#### **Plant Material Preparation:**

Phyllanthus niruri plant material is thoroughly dried and cleaned. Remove any dirt or impurities. Grind the dried plant material into a fine powder using a mortar and pestle or grinder. Finely powdered material will enhance the extraction process. Solvent selection:

Suitable solvent for extraction. Ethanol or isopropyl alcohol is commonly used for herbal extractions due to their ability to extract a wide range of compounds. Alternatively, distilled water can be used for aqueous extractions. Extraction : Various methods like percolation, maceration and

Soxhlet apparatus are used for alcoholic extraction of Phyllanthus niruri. Decoction is done for aqueous extraction of the plant.

#### **Preparation of Aqueous Extract:**

The formulation begins with an aqueous extract of Phyllanthus niruri powder. The powder is soaked overnight in distilled water. The mixture is then boiled to reduce the volume of water to 1/4 of the original quantity. The extract is filtered to remove unwanted insoluble material, resulting in a reddish-brown aqueous extract. The filtrate is boiled using Hot Plate ,Hence, Solvent containing phytoconstituent is evaporated and dark brown coloured (which gives yellow appearance in water) solid powder is left behind. (The Percentage yield found to be 3.32%)

#### **Preparation of the Ethanolic Extract:**

An ethanolic extract of the herb is prepared and decolorized using activated charcoal. The filtrate is boiled using Hot Plate at 90 °C so that after evaporation of ethanol solid dark coloured subsatance is left behind coloured (which gives greenish appearance in water). The percentage yield found to be 2.16%. (All at room temperature.)

**Adjusting the Formulation:** The formulation includesglycerine and preservatives. Suitable preservatives include alkyl esters of p-hydroxybenzoic acid, hydantoin derivatives, propionate salts, potassium sorbate, and sodium benzoate.

#### **Finalization:**

The formulation is allowed to cool and filtered using appropriate filters. The final formulation is almost colorless. Adjunct components can include fragrances. The effect on the skin may also be enhanced by adding various vitamins (e.g., A, C, and B) and nutrients, which also serve as antioxidants to help prevent the emollient degradation of the formulation.

**Preparation of Formula (100 ml) –****Table no 1**

Sr. No	INGREDIENTS	QUANTITY
1	Extract	80 mg
2	Coconut oil	80 ml
3	Clove oil	5 ml
4	Peppermint oil	5 ml
5	Eucalyptus oil	5 ml
6	Preservative	2 ml
7	Additives	q.s

**EVALUATION STUDY****Chemical Test For Ethanolic Extract****Alkaloids:**

Dragendorff reagent test : add 2ml ethanol extract and 0.2 ml of Dil.hcl to test tube, 1ml of dragendroff reagent, orange brown (present).

Figure 1

**fig 1****Mayer's test :**

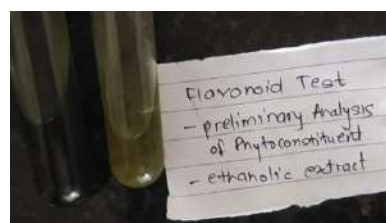
few drops of mayer's reagent to 1 ml of extract , yellowish or white precipitation forms (alkaloid present)

**Phenolic Compounds:**

Litmus test : ferric chloride blue or violet indicates the presence.

**fig . 2****Flavonoids :**

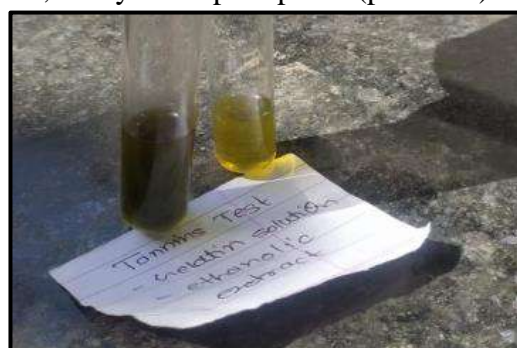
Alkaline reagent test: 3ml of extract with 1ml of 10% naoh solution. Presence of flavonoids is indicated by the formation of an intense yellow color.

**fig 3****Preliminary Analysis of Phytoconstituent:**

add 2 to 3 ml drop of naoh solution, presence of flavonoids is indicated by the formation of an intense yellow color.

**Tannins:**

Phenazone test: 5ml aq.tannin drug, 0.5g sodium acid phosphate, cool and filter, 2% phenazone in filtrate , bulky color precipitate (presence).

**fig 4**

**Gelatine test:**

1 percent gelatin solution, 10% nacl, 1% solution tannin extract, precipitation occurrence tannin present.

**Lignans:**

To identify lignans in a sample, Ethanolic extract is mixed with Phloroglucinol and HCL which gives pink colouration

**Table No.: 2**

Chemical Compounds	Result
Alkaloid	+
Phenolic Compounds	-
Flavonoids	+
Tannins	+
Lignans	+



**fig 5**

**Chemical Test For Aqueous Extract:**

**Flavonoids:**

Pew test : mix 5 ml of aq.solution with 0.1 g metallic zinc and 8 ml of conc. H2so4, look for red color which indicates the presence of flavonoids



**fig 6**

**Naoh test :**

2to 3 drop of naoh to 2 ml of extract , deep yellow turns colourless when added few drops of Dil.hcl

**Ammonia test :**

add 5ml of dil.ammonia to a filtrate, add 1 ml of conc. H2so4, a yellow color that disappearance on shaking indicates presence of flavonoids.



**fig 7**

**Phenolic compounds:**

Ferric chloride test: add few drops of 10% ferric chloride solution to 1 ml of the filtered plant extract sample. A green blue or violet color indicates the presence of phenolic compounds.

**Alkaloids :**

Mayer's test : few drops of mayer's reagent to 1 ml of extract , a white or yellowish precipitate indicates the presence of Alkaloids.



**fig 8**

**Dragendorff reagent:**



add 1ml of dragendorff reagent to 2ml of extract, an orange red precipitate indicates the presence of Alkaloids

**Wagner reagent test:**

add 2 drop of Wagner reagent to 2ml of extract and mix well. A reddish color indicates the presence of Alkaloids.



fig 9

**Tannins:**

**Ferric chloride test :**

2 ml of 5% fecl2 solution 1ml of extract, look for a dark blue color which indicates the presence of tannins.

**NaOH test :**

add 2 ml of 1N naoh to 2 ml of extract, look for a yellow to red color.

Table No.: 3

Chemical Compounds	Result
Alkaloid	+
Phenolic Compounds	+
Flavonoids	+
Tannins	+



Test for Tannin

fig 11

**Appearance -**

It appears light yellowish and translucent.

**Odour -**

Formulation carries a delicate lavender scent, courtesy of lavender oil added.

**pH -**

Oils don't possess a pH

Ph of ethanolic extract and Aqueous extract is 6.32 and 4.38

**Relative Density -**

Density of formulation is 0.9322 g/ml (Calculated value)

Density of water at room temperature is 0.997 g/ml (Standard value)

**Percentage yield -**

Percentage yield of Aqueous extract is 3.32%

Percentage yield of Ethanolic extract is 2.16%

**Thin Layer Chromatography -**

TLC of ethanolic extract sample was found to be 6.4 and 6.7

**Viscosity**

The viscosity of the solution was found to be 12.32cp

**Surface Tension -**

Calculated using drop count method.

Surface tension of sample was found to be 33.900 dyne/cm

**Spreadability**

Forms a mostly continuous film formation

**Skin irritancy test -**

Prepared formulation is applied on the hand surface

No irritation on skin surface for 24-48 Hours

## RESULT AND DISCUSSION

The herbal liquid formulation contains extracts from *Phyllanthus niruri*, essential oils (clove oil, peppermint oil, eucalyptus oil, coconut oil), fragrance, and vitamins. Both ethanolic and aqueous extracts were evaluated for the presence of various chemical compounds. Alkaloids, flavonoids, and tannins were detected in both types of extracts, confirmed by specific chemical tests. The detection of alkaloids, flavonoids, and tannins in both ethanolic and aqueous extracts highlights the effectiveness of the extraction process and the potential therapeutic benefits of the formulation. These bioactive compounds are known for their anti-inflammatory and analgesic properties. The inclusion of essential oils and vitamins further enhances the formulation's utility in skincare, aromatherapy, and holistic wellness. Continued research and clinical studies are necessary to establish the efficacy, safety, and long-term benefits of this herbal liquid spray across diverse populations and clinical settings.

## CONCLUSION

The formulation and evaluation of herbal Antiseptic solution offer promising avenues for harnessing the therapeutic potential of natural ingredients in skincare, aromatherapy, and holistic wellness. Through a meticulous formulation process, this study successfully developed a herbal antiseptic oil solution primarily derived from *Phyllanthus niruri*, enriched with essential oils, fragrance, and vitamins. Chemical composition analysis revealed diverse array of bioactive compounds, including alkaloids, flavonoids, and tannins, highlighting the formulation's potential for therapeutic efficacy.

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