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UNLOCKING THE POTENTIAL OF PHYLA NODIFLORA LINN: A COMPRESSIVE REVIEW OF IT'S ANTI – DANDRUFF ACTIVITY

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ABSTRACT

Millions of people worldwide suffer with dandruff, a common scalp condition marked by redness, itching, and flakes of dead skin. The medicinal plant Phyla nodiflora Linn. Has long been used to treat dandruff and other skin disorders. This review seeks to give a thorough summary of Phyla nodiflora Linn, 's anti-dandruff properties while emphasizing the plant's potential as a natural treatment. We go into great detail about the plant's pharmacological characteristics, chemical makeup, and current studies on its anti- dandruff effect. Because of its anti-fungal, anti-inflammatory, and antioxidant qualities, Phyla nodiflora Linn. Is a useful remedy for dandruff. Extracts from the plant have been shown to prevent the growth of dandruff-causing Malassezia species. Additionally, it has been demonstrated that Phyla nodifiora Linn. Lowers oxidative stress and inflammation, two major contributors to the formation of dandruff. The bio-active components of Phyla nodiflora Linn., such as flavonoid, phenolic acids, and terpenoids, are responsible for its anti-dandruff properties. These substances are promising candidates for the creation of anti-dandruff treatments because of their strong anti-fungal and anti-inflammatory properties. According to recent research, Phyla nodiflora Linn. May be used as a natural treatment for dandruff. Extracts from the plant have been shown to be both safe and helpful in lowering the flaking, itching, and redness associated with dandruff. Furthermore, it has been demonstrated that Phyla nodiflora Linn. Supports good scalp conditions, lowering the likelihood of dandruff recurrence. The potential of Phyla nodifiora Linn. As a safe, natural remedy for dandruff is highlighted in this review. To thoroughly investigate its anti-dandruff properties and turn it into a marketable product, more research is required. There are a number of advantages to

using Phyla nodiflora Linn. As a natural treatment for dandruff, such as less negative effects, affordability, and easier accessibility.

KEYWORD: Phyala nodiflora Linn, Anti - dandruff activity, Medicinal plant, Natural remedy, Dandruff treatment.

INTRODUCTION

Redness, pitching, and dead skin particles are the hallmarks of dandruff, a common scalp ailment. It can be brought on by a number of things, such as fungal infections, sensitivity to hair care products, and skin disorders, and it impacts millions of individuals globally. Dandruff is one of the many skin disorders that have historically been treated with the medicinal plant Phyla nodiflora Linn. Bioactive substances with antifungal, anti-inflammatory, and antioxidant qualities, including as flavonoids, phenolic acids, and terpenoids, are abundant in the plant.

Although the precise aetiology of dandruff is still unknown, a number of factors, such as fungal infections, skin sensitivity, and individual predisposition, are thought to be involved.[1] Dandruff has been connected to a form of fungus called Malassezia species, which is frequently present on the scalp.[2] Inflammation and flaking may result from the fungus's consumption of the oils the scalp produces, which produces oleic acid.[3] Because of its antifungal, anti-inflammatory, and antioxidant qualities, Phyla nodiflora Linn. Has long been used to treat a variety of skin issues, including dandruff. Extracts from the plant have demonstrated antioxidant action, decreased inflammation, and inhibited the growth of Malassezia species.[4, 5] Because of these qualitiens, Phyla nodiflora Linn. May be used as a natural treatment for dandruff Jalapippal, which belongs to the Phylum nodiflora L. Greene Syn., Family Verbenaceae, Lyppa nodiflora.

Flavonoids and phenolic acids are among the bioactive substances that provide Phyla nodifiora Linn. Its antifungal properties. It has been discovered that these substances prevent the growth of a number of fungus, induding species of Malassezia.[6,7] The plant's bioactive components, which have been shown to lessen oxidative stress and inflammation, are also responsible for its anti-inflammatory properties.[8,9]

The potential of Phyla nodifions Linn. As a natural treatment for dandruff has been brought to light by recent studies. Extracts from the plant have been shown to be both safe and effective

in lowering the flaking, itching, and redness associated with dandruff.[10, 11] Furthermore, it has been demonstrated that Phyla nodiflora Linn. Supports healthy scalp conditions, lowering the likelihood of dandruff recurrence.[12]

In conclusion, Phyla nodiflora Linn, Is a medicinal plant that may be used as a natural treatment for dandruff because of its antifungal, anti-inflammatory, and antioxidant qualities. To thoroughly investigate its anti -dandruff properties and turn it into a marketable product, more research is required.

All things considerate, Phyla nodiflora Linn. Is a promising natural cure for dandruff, and more research should be done on its potential as a therapeutic option. Phyla nodiflora Linn. May prove to be a useful supplement to the current array of dandruff remedies with further study and advancement.

Examples

1. Anti fungal activity: Extracts from Phyla nodiflora Linn. Have been demonstrated to stop the growth of Malassezia species, which are frequently responsible for dandruff.

2. Anti-inflammatory activity: The plant's extracts have been found to reduce inflammation, which is a key factor in the development of dandruff.

Figure 1: Phyla nodiflora Linn.

Pharmacological Account

1) Kindom – plante
2) Division – Magnoliophyta
3) Class – Magnoliophyata
4) Order – lamialas

5) Genus – Phyla
6) Species – nodiflora.

Vernacular Name

English – lippa.

Hindi – bakkan Jalpali.

Sanskrit – Vasir Vasuka.

Philippines – Busbusi, Chachahan.

Tamil – Poduthalai.

Thailand – yaa Riet pla.

Synonyms

1.Lippanodiflora

2.Kunth

3.Lippia incisa

4.Phyla nodiflora var rosea

Biological Source

The biological source of Phyla nodiflora Linn is the plant itself, specifically it's

Aerial parts: Leaves, Stems, and flowers.

Whole Plant: Sometimes the entire plant is used in traditional medicine.

Family: Verbenaceae

Geographical Source

Asia: India, Japan, Southeast Asia.

Africa: Tropical and subtropical regions of Africa.

American: South America.

Chemical Constituents

1. Flavonoids

Nodifloretin: A flavonoid isolated from the plant.

4 – hydroxywogonin: Another flavonoid compund found in Phyla nodiflora Linn.

Cirsiliol: A flavonoid with potential therapeutic benefits.

Eupafolin: A flavonoid compund with anti – inflammatory and antioxidant properties.

2. Phenolic Compounds

Acetoside: A compound yielded from the alcoholic extract of P. nodiflora.

Demethoxy centaureidin: Another compound found in the plant's alcoholic extract.

3. triterpenoids

Lippiacin: A new triterpenoid isolated from the methanolic extract of Phyla nodiflora Linn.

4. Terpenes

Beta pinene: A monoterpene found in the essential oil of Phyla nodiflora Linn.

Beta Ocimene: Another monoterpene present in the plant's essential oil.

Terpinolene: A monoterpene with potential therapeutic applications.

Alpha copaene: A sesquiterpene found in the plant's essential oil.

Chemical composition

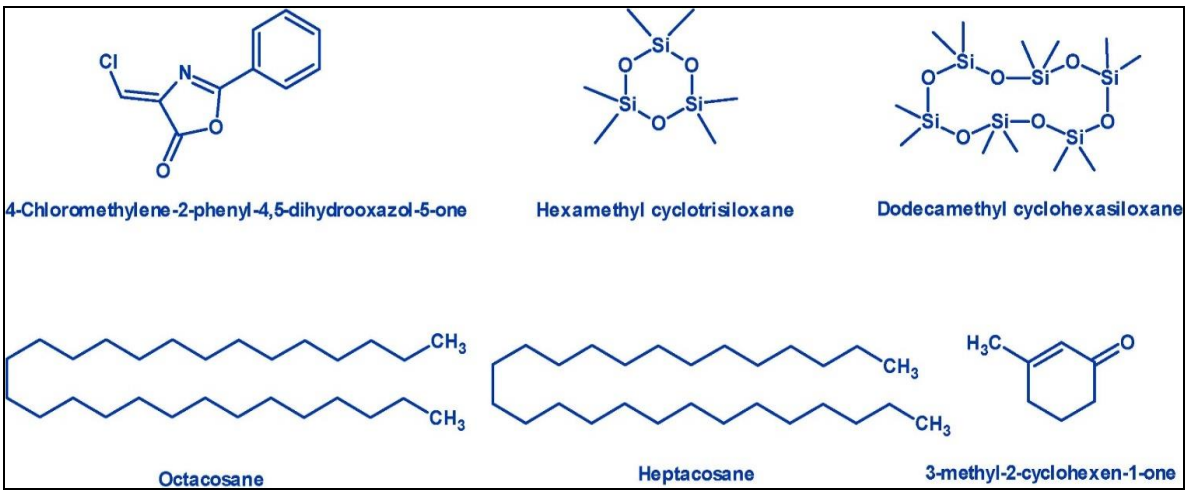

Figure 2: Phyla nodiflora Linn's chemical composition.

Microscopical Characters

Leaf: Epidermal cells with wavy walls, trichomes present.

Steam: Cortical cells with sclerenchymatous fibers.

Roots: Cortical cells with starch grains.

Flowers:

Calyx: Dorsiventrally flattened, 1.4 mm long, divided adaxially to around the centre and aboxilly to nearly the base.

Corolla: Tube 1.5 mm long, lobes uneven, 0.6 – 0.8 mm in diameter, mauve, pink or white with a yellow core.

Inflorescence

Spikes: 0.3 – 2.5 long, cylindrical, and purplish.

Bracts: 2- 3 × 3 – 5 mm, broadly obovate to bolate cuspidate.

Fruits: Shape 12×1-1.2 mm, rounded bovoid, with two pyrences.

Chemical Test

Chemical tests Phyla nodiflora Linn's may include

Flavonoid detection: Shinoda's test or pew's test to find out if flavonoids are present.

Terpenoid detection: methods for identifying the presence of terpenoids such as Liebermn Burchard or salkowski's tests.

Alkaloid detection: Alkaloids cancel be found using test such as mayer's or Dragedroff's

Identification Test

Identification test for Phyla nodiflora linn may include

Macroscopic examination: Examining the physical traints of the plant, such as it's leaves, steams and flowers, is known as morphological identification.

Microscopic analysis: Examining the histology and cellular makeup of the plant.

Chemical analysis: Finding out whether certain substance, like terpenoids or flavonoids a are present.

Chemical Structure

Chemical structure of ursolic acid.

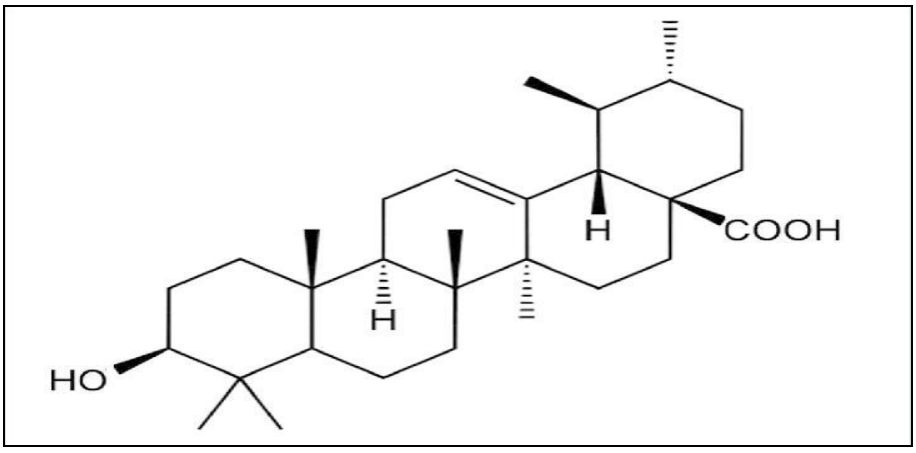

Figure 3: Ursolic acid.

Pharmacological Uses

Numerous pharmacological characteristics of Phyla nodiflora Linn have been discovered, Including:

1. Anti-inflammatory activity: Extracts from Phyla nodiflora Linn have been demonstrated to lessen inflammation and the symptoms of inflammatory diseases.

2. Antioxidant activity: Antioxidant qualities found in the plant's extracts can aid in preventing cell damage and oxidative stress.

3. Antimicrobial activity: It has been discovered that Phyla nodiflora Linn possesses antibacterial activity against a variety of microorganisms, including as fungi and bacteria.

4. Antifungal activity: The plant's extracts have been shown to inhibit the growth of fungi, making it a potential treatment option for fungal infections.

5. Wound healing activity: Phyla nodiflora Linn has been traditionally used to promote wound healing, and studies have confirmed its efficacy in enhancing wound closure.

6. Anticancer activity: Phyla nodiflora Linn may have anticancer effects, according to certain studies, although more research is required to establish this.

7. Neuroprotective activity: Extracts from the plant have been shown to have neuroprotective properties, which could aid in the prevention or treatment of neurodegenerative diseases.

8. Cardioprotective activity: Cardioprotective benefits of Phyla nodiflora Linn have been demonstrated to help prevent or treat cardiovascular diseases.

9. Anti-diabetic activity: Phyla nodiflora Linn may have anti-diabetic qualities, according to Certain Studies, Although More Research Is Required To Verify This.

Preliminary phytochemical analysis

Alkaloids, glycosides, flavonoids, tannins, phenolic compounds, steroids, terpenoids, carbohydrates, proteins, amino acids, gums, and mucilage are among the many phytochemical elements found in Phyla nodiflora. One of the main components is flavonoids.

Phytochemistry

Phyla nodiflora leaf dichloromethane and methanol extract were used to differentiate Halleridone and Halleron as taxonomic markers (Ravikanth et al., 2000). The skin-whitening compound eupafolin, which was isolated from a methanol extract of dried aerial portions of Phyla nodiflora, downregulates melanogenesis (Yen et al., 2012). Methanol preparations of the complete Phyla nodiflora plant have been shown to contain flavanoids, such as nodifloretin, eupafolin, and hispidulin. Ko et al. (2013) and Barua et al. (1971). Steam-distilled extracts from Phyla nodiflora showed the presence of volatile components, including

combinations of hydrocarbons and oxygenates. The primary components are K-carbolene, methyl salicylate, linalool, and cyclen-8-ol (Elakovich and Stevens 1985).

Pharmacological effects

Effects of diuretics, antihyperuricemics, and antiurolithiatics

Three flavonoids, 6-hydroxyluteslin, 6-hydroxyluteolin-7-O-glycoside, and nodiflorerin, as well as two phenylethanoid glycosides, arenarioside and verbascoside, were extracted from the methanolic extract of Lippia nodifloru. The compounds that were identified demonstrated an inhibition of santhine oxidase activity, with IC values ranging from 7.52 0.01 to 130.00 +2.25 µM 19637. In rats given potassium oxonate and hypoxanthine to generate hyperuricemia, the antihyperuricemic properties of Lippia nodiflora methanol extract, fractions, and chemical constituents were examined, as well as their mode of action. The serum uric acid level of hyperuricemic rats decreased in a dose-dependent manner when given methanol extract orally.

Hapatotrophic effect

The hepatoprotective effect of crude flavonoid fraction (25, 50 mg/kg for 21 days) of aerial parts of Lippia nodiflora was evaluated in ethanol induced oxidative stress in liver in rats. The crude flavonoid fractionshowed significant ($p<0.05$) protective effect by decreasing the elevated liver marker enzymes, total bilirubin, lipid peroxidation marker and ameliorated the diminished serum total protein as well as antioxidant levels in a dose dependent manner.

Role of antidrandrruf activity of Phyla nodifiora Linn and Potential mechanism and benefits

Mechanism

1. Antimicrobial action: Antimicrobial qualities may prevent the fungus Malassezia furfur, which causes dandruff, from growing

2. Anti – Inflammatory action: Because of the plant's anti-inflammatory qualities, the scalp may feel less irritated and inflamed.

3. Antioxidant activity: The antioxidant qualities of Phyla nodiflora may shield the scalp from oxidative stress, which can make dandruff worse.

Benefits

1. Reduced flaking and scaling: Phyla nodiflora may lessen dandruff-related flaking and scaling by regulating fungal development and irritation.

2. Soothed scalp irritation: Redness and itching may be lessened by the plant's anti-inflammatory qualities.

3. Promoted scalp health: The antibacterial and antioxidant qualities of Phyla nodiflora may contribute to the preservation of a healthy scalp environment.

Potential applications

1. Natural antidandruff treatments: A natural component in antidandruff shampoos, conditioners, and scalp treatments is nodiflora.

2. Scalp care products: Because of its qualities, the plant might be a good addition to products meant to support healthy scalps and lessen the symptoms.

Advantage and Disadvantage of Anti – drandrruff activity

Advantage

1. Symptom relief: Antidandruff products relieve redness, itching, and flaking.

2. Scalp health: A healthy scalp environment is promoted by antimicrobial and anti-inflammatory qualities.

3. Natural treatment options: Natural alternatives to synthetic antidandruff treatments are provided by plant-based products.

4. Prevention: Frequent use could help stop dandruff from coming back.

5. Improved appearance: Hair and scalp appearance might be enhanced by less flaking and peeling.

Disadvantage

1. Variable efficacy: Effectiveness could differ based on product formulation, dandruff severity, and individual skin types.

2. Potential side effects: A few antidandruff Dryness, allergic reactions, or skin irritation can result with treatments.

3. Limited research: To completely comprehend the effectiveness and safety of particular antidandruff products, more research is required.

4. Regulatory considerations: Regulatory oversight may have an impact on the consistency and quality of the product.

5. Dependence on continuous use: For antidandruff treatments to remain effective, they may need to be used consistently.

6. Potential interactions: Certain antidandruff products have the potential to worsen underlying diseases or interfere with other treatments.

CONCLUSION

In conclusion, with its antifungal, anti-inflammatory, and antioxidant qualities, Phyla nodiflora Linn. Shows promise as a natural treatment for dandruff. It is an effective therapy for dandruff since its extracts have been demonstrated to lower inflammation and stop the proliferation of Malassezia species. Phyla nodiflora Linn. Provides a safe and natural alternative for dandruff management because of its abundance of bioactive components and possible advantages. Millions of individuals worldwide suffer from this widespread scalp condition, and more research is required to thoroughly investigate its anti-dandruff potential and turn it into a commercial product.

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