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Research Article

Evaluation of Potential Parameter of *Cestrum nocturnum* Plant Extract

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Abstract

Background: *Cestrum nocturnum* plant having potential versatile properties like antifungal, antibacterial actions. it having components include linalool (3.1%), benzaldehyde (2.5%), benzyl alcohol (2.4%), phenylacetaldehyde (2.4%), cis-jasmone (2.1%), benzyl acetate (1.8%), phenol (1.6%), methyl jasmonate (1.5%), 1,8-cineole (1.4%), borneol (1.3%), eugenol (1.3%). We can used its versatility action to potential dosage form.

Methodology: Powder extract of given plant was received as a gift sample from herbal company. With certificate of analysis is provided from company. All evaluation test had performed with extract with proven its chemical constituent and pharmacological activity. Given powder extract with different concentration mg/ml used for antifungal activity.

Result: Given extract with different concentration gives better antifungal activity over synthetic drug. It was found larger zone of inhibition over *candida albicance*. Safonin glycoside test was performed for active chemical constitute which found to be positive test.

Conclusion: Our findings highlight the importance of considering botanical natural products in the search for potential biocontrol agents in order to detect new bioactive compounds against persistent and emergent phytopathogenic fungi. In this work, pennogenin tetraglycoside was identified as the main compound responsible for the antifungal activity displayed by the crude extract and fractions of *C. nocturnum*.

Keywords: *Cestrum nocturnum*; Antifungal; Zone of Inhibition; Pennogenin Tetraglycoside

Introduction

A garden shrub from the Solanaceae family called *Cestrum nocturnum* is referred to as the "lady of the night" and is used as a medication for a variety of illnesses. The glossy, simple leaves, vine-like branches, greenish-creamy white tubular blooms, and juicy berries of this sprawling shrub are all present. 1. The berries have an aubergine or marfil white color. The term "nocturnum" describes the characteristic of the plant to open its little, strongly perfumed flowers at night [1]. The plants feature a tall, woody stem, robust buds with a hint of pink, and a snow-white star-shaped flower with ten thin, longer, and more widely spaced petals. The flower has an inflorescence, or cluster form, with a mildly agreeable aroma [2]. Its slaver form is characterized by its tubular base and open, flat petals. climbs up to 20 feet as a vine and up to 3–4 feet as a shrub by itself. When planted close to a support, it uses tendrils or twines to ascend [3]. More than 25% of the global population experiences fungal infections, but the significant impact of these infections is often overlooked. The majority of fungal infections are surface-level and can be easily cured 8. Yet, fungi are also responsible for deadly invasive diseases, with a mortality rate exceeding 50%, resulting in approximately 1·5 million deaths annually. 9. Invasive diseases caused by *Candida* spp. and *Aspergillus* spp. have a mortality rate of 30–50%. In the developing world, there are 1 million cases of cryptococcal disease annually, leading to 675,000 deaths [1,8]. Given plant shows versatile property over fungus. Gives better antifungal property.

Cultivation

Throughout southern Asia, Europe, Africa, and the Pacific, it is frequently produced in warm climates. It is grown in Tamil Nadu, Andhra Pradesh, and Karnataka, India. Jasmine needs 27–32°C during the day and 21–27°C at night to bloom [4]. In the states of Tamil Nadu, Karnataka, Maharashtra and Andhra Pradesh, Jasmine is cultivated as an economic crop for cut flowers. In the garden the jasmine is raised as a dwarf-growing shrub and a few species are grown as climbers [5].

Antifungal activity

There is no report available in the literature on the analyses of essential oil from flower parts of *C. nocturnum* and its antifungal

property. Therefore, we have undertaken to investigate the antifungal activity of the essential oil and organic extracts from flowers of *C. nocturnum* [6].

Chemical constituent

Over 130 compounds were found with over 100 being recognized. The compounds that had a concentration greater than 1% and were valuable in terms of smell were: Furthermore, over 70 other intriguing volatiles along with over 10 higher hydrocarbons (above C16) and over 10 fatty acids and their esters were also detected in the pure essence [3]. Key components include linalool (3.1%), benzaldehyde (2.5%), benzyl alcohol (2.4%), phenylacetaldehyde (2.4%), cis-jasmone (2.1%), benzyl acetate (1.8%), phenol (1.6%), methyl jasmonate (1.5%), 1,8-cineole (1.4%), borneol (1.3%), eugenol (1.3%), linalyl acetate (1.2%), and citronellyl propionate (1.1%) [3-5].

Uses

Jasmine is utilized for a range of medicinal purposes. It has been employed for treating liver disease, liver pain caused by cirrhosis, and abdominal pain from acute diarrhea. It assists in the management of headaches, sunburns, rashes, irritability, pain, anxiety, depression, and urinary issues. 5. The smell of the flower is believed to provide relief for those experiencing depression. There are numerous advantageous uses for Jasmine essential oil. It is also a fantastic oil for massages [4,5]. Night blooming jasmine is known for its medicinal benefits, such as antioxidant, anti-hyperlipidemic, hepatoprotective, analgesic, antibacterial, antifungal, anti-convulsant, anti-HIV, and larvicidal properties [1,6].

Material and Method

Powder extract of given plant was received as a gift sample from herbal company. With certificate of analysis is provided from company. All evaluation test had performed with extract with proven its chemical constituent and pharmacological activity. Given powder extract with different concentration mg/ml used for antifungal activity.

Result and Discussion

Safonin glycoside test

- **Haemolysis test:** A single blood drop on a slide combined with a small amount of aqueous saponin solution results in the observation of damaged red blood cells, indicating the existence of saponin glycoside [14]
- **Foam test:** 1 gram of drug sample mixed with 10 to 20 milliliters of water is thoroughly shaken to create bubbles, indicating the presence of saponins [14,16].

HPLC

The phenolic and flavonoid components of the leaf ethanolic extract will be separated using the Ben-Hammouda method. On a rotary shaker, three hundred grams of dried plant leaves were agitated for twenty-four hours at 200 revolutions per minute with 500 milliliters of sterile water [17]. Following these steps, the mixture is vacuum-filtered through a sheet of Whatman Company filter paper that is three millimeters thick. It is then centrifuged for thirty minutes at eighteen degrees Celsius at twelve and a half revolutions per minute. Phosphoric acid is then added to the mixture to dilute it until the combination's pH reaches 2.5. The diethyl ether was then eliminated on a left evening by evaporation at thirty degrees Celsius after being sacked three times in a separate funnel with a 1:1 ratio of diethyl ether. Before HPLC analysis, the residue was redissolved in three millilitres of high-grade HPLC methanol and filtered through a 0.2-micron filter-sterilized membrane. Individual phenolic compounds in plant samples were identified using a hypersil C18 reversed-phase column (250 x 4.6mm) with a particle size of 5m at Hewlett-Packard [14,16,17].

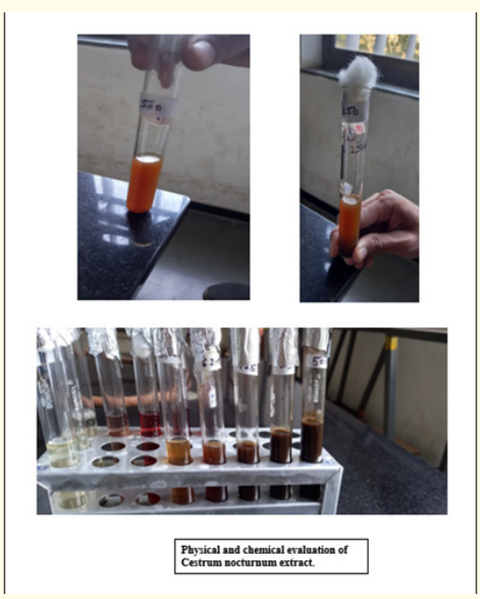

Figure 1: Physicochemical evaluation.

Well diffusion method

The agar that had been inoculated was poured onto the assay plate, which had a diameter of 9 cm, and then left to cool on a flat surface. 21.After the gel had hardened, four holes, each measuring 4 mm in width, were carved out of the agar, and 20 µl of the antifungal substance were deposited into each hole. Four antimycotics were added to each plate and then incubated for 24 hours at 35°C [18].

Cup-plate and cylindrical plate method

In these procedures, agar is melted, cooled to 45°C, inoculated with test microorganisms, and poured into a sterile Petri dish. In the cup-plate technique, after the agar has solidified, 9mm diameter holes are cut in the medium with a sterile cork borer and the antimicrobial agent is placed directly in the holes. In the filter paper

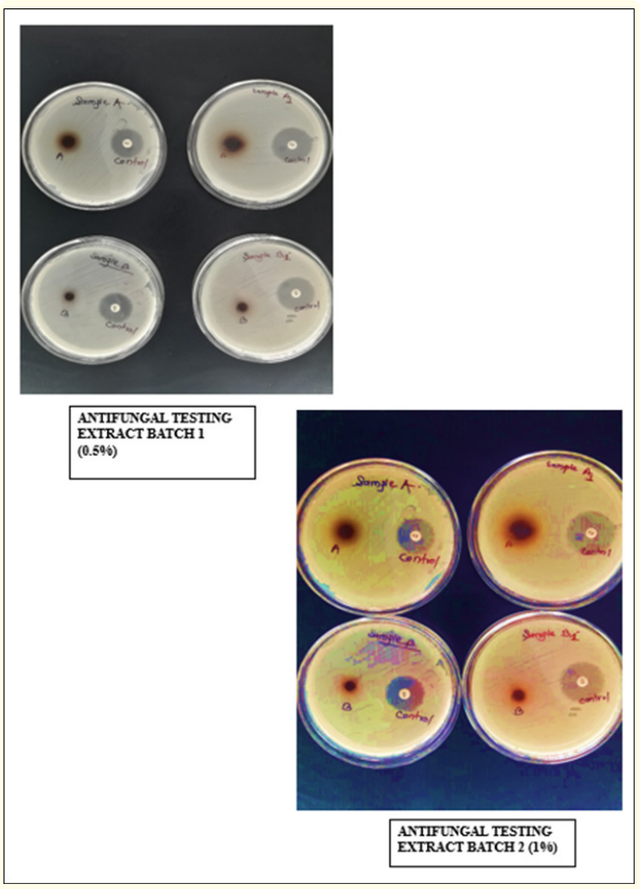

Figure 2: Antifungal Testing.

and cylinder plate method, the antimicrobial agent is applied to the surface of the solidified, inoculated agar using a filter paper disc and cylinder respectively. The zone of inhibition is then observed following an incubation period of 2 to 3 days at 30 to 35°C. The size of the zone of inhibition is a reflection of the varying effectiveness of various antimicrobial agents on the tested microorganisms [14,18].

As overall the aromatic flowers and volatile chemicals found in the essential oils of *Cestrum nocturnum* are well-known features of this plant. Nevertheless, only a small number of phytochemical investigations have been conducted to look for bioactive compounds in more polar extracts. Safonin glycoside test was performed for active chemical constitute. To prove the antifungal activity of *Cestrum nocturnum* flowers methanolic extract well diffusion method was performed. Mic was checked by liquid dilution method. In this study, a methanolic extract of *Cestrum nocturnum*'s flowers was used to identify and quantify metholic components. Hence, the metholics found in the Extraction of *Cestrum nocturnum* could be co-responsible in part of the antifungal effect observed for this plant species. In this study, the primary component responsible for the antifungal activity exhibited by the crude extract and fractions of *C. nocturnum* was found to be pennogenin tetraglycoside, a steroidal saponin.

Conclusion

The results of this work demonstrated the relevant antifungal potential of the crude extract. Pennogenin tetraglycoside, is reported in the species *C. nocturnum* and is the phytochemical reported able of inhibiting. Our findings highlight the importance of considering botanical natural products in the search for potential biocontrol agents in order to detect new bioactive compounds against persistent and emergent phytopathogenic fungi. In this work, pennogenin tetraglycoside (a steroidal saponin) was identified as the main compound responsible for the antifungal activity displayed by the crude extract and fractions of *C. nocturnum*. The precise mechanism of action that explains the antifungal activity exhibited by *C. nocturnum* extract and fractions is not fully understood. saponin compounds which present amphipathic chemical features would act on the hyphae of the mycelium causing the release of the components of the cells cytoplasm and/or the loss of rigidity and integrity of the cells wall, leading to the collapse and death due their well-known surfactant properties. This hypothesis agrees with our results. Further studies are needed to address the mechanism of action of the active compounds here identified. The antifungal activity of *C. nocturnum* extract and fractions is not completely understood in terms of its precise mechanism of action. It is hypothesized that saponin compounds, which have amphipathic chemical features, may act on the mycelium's hyphae, resulting in the release of cell cytoplasm components and/or the loss of cell wall rigidity and integrity, ultimately causing cell collapse and death due to their well-known surfactant properties. This hypothesis is in line with our results. Further studies are needed to address the mechanism of action of the active compounds here identified.

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