

Pre-liminary Phytochemical Screening of Ethanolic Leaf Extract of *Nyctanthes arbor-tristis*

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Abstract: Ayurveda is a traditional medicinal system that plays an important role in a holistic approach to health and wellness. The importance of utilizing phytochemicals found in therapeutic plants has recently increased on a global scale. *Nyctanthes arbor tristis*, a well-known Indian medicinal plant belongs to the family of Oleaceae. It is a shrub or small tree that is cultivated in many parts of India. The solvent used for the Soxhlet extraction of plant leaves was ethanol. The significant phytochemical activity was performed by standard protocols to analyse tannins, saponin, cardiac glycosides, carbohydrates and phenols at various concentrations. The results obtained in the present study suggest that *Nyctanthes arbor tristis* shows a presence of phytochemicals that leads to new drug development.

Keywords: *Nyctanthes arbor tristis*, Phytochemicals, Soxhlet extraction, Health, Drug development

1. Introduction

Traditional medicine has used therapeutic plants, often known as medicinal herbs, since the dawn of time. Due to their affordability and accessibility compared to contemporary pharmaceuticals, medicinal plants are frequently employed as folk medicine in non-industrialized societies. Most people on the globe depend on traditional health care specialties that require maintenance as higher plants that have a source of bioactive substances are still available. Plants to assume a prominent role in preservation of human health. Epidemiological evidence suggests that natural bioactive substances play an essential role in the treatment and control of modern diseases [Xiao J Handbook of Dietary Phytochemicals, 2015]. In Ayurveda, Parijat (*Nyctanthes arbor tristis*) is used for the treatment of alimentary diseases. It's commonly known as "night jasmine" (Harisangar) or "Pavalamalli" in Tamil as a wonderful plant with great medicinal properties. It's belonging to the Division: Magnoliophyta; class: Magnoliopsida order; Lamiales; Family: Oleaceae and is a common plant in India. Knowledge of the chemical components (Phytochemicals) in plants is useful not only for the identification of therapeutic ingredients; however, as such information may be extremely valuable in identifying new sources. Some beneficial plant chemicals for the creation of sophisticated chemical compounds and for determining the real relevance of traditional medicines [P B Ramachandran et al., 2014]. Parijat (night jasmine) is a divine tree in Hindu mythology. A story reveals that the drug Parijat is a heavenly tree brought to earth by Lord Krishna. The tree is referred to as "tree of sorrow" because the foliage becomes droopy when blooming flowers drop off in the morning. The use of leaves, branches, petals and seeds for medicinal purposes. The leaves are used to treat obstinate sciatica, rheumatism and even chronic fever. Phytochemicals are the synthesis of complex chemical substances and for identifying the genuine significance of folkloric remedies. Owing to the global trends towards improved "quality of life", there is considerable evidence of an increase in demand for medicinal plants (Kotnis et al., 2004). In this present investigation phytochemical analysis

of leaf extraction to be carried out. By enhancing the present uses of plant (*Nyctanthes arbor-tristis*) extract, this study will hopefully reveal new areas of research.

2. Materials and Methods

Collection of plants Materials

Mature leaves were collected from the early morning near the famous pasupatheeswarar temple in Karur. The collected plant materials (leaves) were processed to investigate the study of Phytochemicals.

Soxhlet extraction method:

Leaves of *Nyctanthes arbor-tristis* plants were collected. Leaves were washed and air dried under shade and powdered. Powdered leaves were weighed and packed in Soxhlet. Solvent used for extraction was ethanol. Extraction was continued at the temperature of 35°C till clear solvent was observed in thimble. Extract was concentrated in water bath at 40°C. Concentrated extract was concentrated at 40°C in hot air oven. Concentrated extract was packed in an airtight container.

Plant (leaves) extraction procedure:

10 grams of air-dried powder was taken in 100 ml of ethanol in a conical flask, plugged with cotton wool and then kept on a rotary shaker around 220 rpm for 24 hours. After 24 hours, the supernatant was discarded and ethanol evaporated from the powder. This dry powder was taken in 100ml of solvent (ethanol) in a conical flask, plugged with cotton and then kept in a rotary shaker around 220 rpm for 24 h. After 24h the extracts were centrifuged for 10 minutes. The supernatant was collected, solvents were evaporated and the dry extraction was weighed and scored at 4°C in airtight container. The extraction was done at least three times. The preliminary phytochemical (Qualitative) screening was carried out in crude dry powder of plant materials. (Dhivya paikara et al., 2015).

Qualitative Phytochemical screening:

Nyctanthes arbor tristis with ethanol extract were subjected to various qualitative tests for the identification of plant constituents present in leaves. (Sachin Chaudhary et al Aug, 2010)

Test for carbohydrates

- a) **Benedict's test:** In 1 ml of filtrate (Plant extract), add 5 ml of Benedict's reagent then keep it heating for 5 minutes. A Darkish- red colour formation was observed, indicating the presence of carbohydrates.
- b) **Molisch's Test:** In 2 ml of filtrate, add 2- 3 drops of Alpha naphthol solution, and then add a few drops of concentrated H₂SO₄. A violet ring formed at the junction of two liquids, indicating the presence of carbohydrates.

Test for alkaloids

Mayer's Test: In 2 ml of filtrate, add 1% HCl kept for a steaming few minutes. Take 1 ml of filtrate; add 6 d drops of Mayer's reagent. White creamier precipitate formed indicates the presence of alkaloids.

Test for Tannins

[a] Ferric Chloride Test: In 1 ml of filtrate, add 5% of 2 ml of Ferricchloride (FeCl₂). Dark blue precipitate was formed, indicating the presence of tannin.

Test for Saponins

In 0.5ml of filtrate, add 5 ml of distilled water (H₂O). Foam (frothing) formation was observed, indicating the presence of Saponins.

Test for Glycosides

[a] Keller- kiliani test: In 2 ml of filtrate, add 1 ml of glacial acetic acid, then add 5% FeCl₂, add 3 drops of H₂SO₄. Greenish blue colour observed that indicates the presence of cardiac Glycosides.

Test for steroids

[a] Liebermann- Burchard Reaction: In 2 ml of filtrate, add 2 ml of acetic anhydride, 3-4 drops of concentrated sulphuric acid. Blue ring formation observed that indicates the presence of steroids

Test for flavonoids

In 2 ml of filtrate, add HCl then add magnesium ring. Pink tomato of flavonoids (yellow orange) colour was formed that indicates the presence flavonoids.

Test for phenols

In 1 ml of filtrate, add 2 ml of distilled water (H₂O), and then add 5 drops of 10% FeCl₂. Green colour indicates the presence of phenols.

Table 1: Qualitative phytochemical analysis of Ethanol leaf extract of *Nyctanthes arbor tristis*

Phytochemical constituents	Result
Test for carbohydrate	+
[a] Benedict test	++
[b] Molisch's test	++
Test for tannins	+++
[a] Ferric chloride test	++
Test for Saponins	+++
Test for alkaloids	++

[a] Mayer's test	
Test for Glycosides	++
[a] Keller-kiliani test	
Test for steroids	+
[a] Liberman-Burchard reaction	
Test for flavonoids	++
Test for phenols	+

Note: (+++) present in high concentration; (++) present in moderate concentration; (+) present in low concentration

3. Result and Discussion

Phytochemical analysis of *Nyctanthes arbor- tristis* revealed the presence of tannins are mostly present, Saponins, flavonoids, glycosides, phenols, and carbohydrates. The secondary metabolites present in *Nyctanthes arbor tristis* are known to be biologically active. They protect plants from harmful agents such as insects and microbes and also from extreme temperatures. Phytochemicals that enhance the biological activity and stability, it leads to identification and new drug discovery is an important toolbox for tackling antimicrobial resistance.

4. Conclusion

The present study concludes that the leaves of *Nyctanthes arbor tristis* showing many secondary metabolites are present. Phytochemical analysis of *Nyctanthes arbor tristis* leaves extracts was done by using the extracts which were obtained by Soxhlet method. The screening of phytochemical constituents of plants *Nyctanthes arbor tristis* indicated the presence of carbohydrates, phenols, saponins and alkaloids in common. They generally have biological activity in the plant host and play a role in plant growth or defence against competitors, pathogens, or predators and are important for new drug discoveries. The plant contains maximum metabolites and its study initial or primary research and there is a need for further investigations for quantitative analysis.

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