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Review Article

Review on Plant *Nyctanthes arbortristis* for Anti Inflammatory Activity

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ABSTRACT

Night jasmine, or *Nyctanthes arbor-tristis* (NAT), is a traditional Ayurvedic plant prized for its many therapeutic uses. The plant's leaves, blossoms, seeds, bark, and fruits have all been used to treat a variety of ailments, including menstrual disorders, bronchitis, arthritis, malaria, and skin diseases. NAT has been shown to have anti-inflammatory, antioxidant, antibacterial, antiviral, antipyretic, and hepatoprotective properties because to its abundance of bioactive phytochemicals, including flavonoids, glycosides, oleanolic acid, essential oils, tannins, carotene, and benzoic acid. NAT offers a potential natural substitute for traditional anti-inflammatory medications in light of their drawbacks and side effects. Its cultural relevance, pharmacological potential, and traditional use emphasize the need for more research into its medicinal uses.

INTRODUCTION

Nyctanthes arbortristis, similarly related to as *N. arbortristis* (NAT), is a significant plant belonging to the Oleaceae family. It is usual introduce in tropical and semitropical regions. This plant is named by many title, like as Parijat, Harsinghar, and Night Jasmine. It contains various beneficial compounds, involve β -sitosterol, Oleanolic acid, Arbortristiside A and B, α -crocetin (or crocin-1), 4-hydroxy hexahydrobenzofuran-7-one, and distinct such material¹. These compounds make

the plant more appealing for medicinal uses. The Greek terms "Nykhta" (night) and "anthos" (flower) are the source of the word "nyctanthes." It is often a shrub or small tree with vivid, very scented blooms that bloom at night and fall off before daybreak, creating a beautiful combination of red and white on the ground underneath. Many plant components have been utilized to treat pain, manage discomfort, and stave off illness since ancient times. The majority of the medications used in prehistoric medicine came from plants, which are the primary and oldest source of N.

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arbortristis. A complicated biological reaction of bodily tissues to damaging stimuli like infections, damaged cells, or irritants is called inflammation. It acts as a defense system designed to eliminate harmful stimuli and start the healing process.²

1. Plant Description

This tree thrives in a wide range of loamy soils, including pH 5.6–7.5 soils seen in typical garden settings. The plant needs frequent watering, but not excessive irrigation, and circumstances

ranging from full sun to partial shade. It is a woody perennial that grows on land and can live for five to twenty years.³

Table No.1 Classification of the plant *nyctanthes arbortristis*

Class	Eudicots
Division	Angiosperm
Family	Oleaceae
Genus	Nyctanthes
Kingdom	Plantae
Order	Lamiales
Species	<i>Nyctanthes arbortristis</i>

Table No.2 Phyto-constituents present in various parts of plant with Pharmacological Effect

Parts	phytoconstituents	Pharmacological effects
Bark	Alkaloids, Glycosides.	Anti-Microbial
Flowers	Apigenin, Anthocyanin, D-Mannitol, Tanninm, Glucose, Carotenoid, Essential Oil, Kaemferol, Nyctanthin, Glycosides, Quercetin, Rengylone, α -crocetin (or crocin-3), β monogentiobioside, β monogentiobioside- β D, β -digentiobioside.	Ant-Bilious, Antifilarial, Anti-Inflammatory Antioxidant Diuretic, Dyspepsia, Ophthalmic, Sedative ⁴
Leaves	Ascorbic Acid, Benzoic Acid, Carotene, DMannitol, Flavanol Glycosides-Astragaline, Friedeline, Fructose, Glucose, Iridoid, Glycosides, Lupeol, Mannitol,	Anthelmintic, Antibacterial Antifungal, Anti-Inflammatory Antioxidant, Anti-Pyretic, Arthritis ⁵ Asthma, Bronchitis, Cholecystagogue, Constipation, Cough, Dyspepsia, Flatulence, Heartburn, Hepatoprotective, Immunoprotectant, Nausea, Reptile Venom, Rheumatism
	Methyl Salicylate, Nicotiflorin, Nyctanthic Acid, Oleanolic Acid, Tannic Acid, β Sitosterole.	Ringworm, Sciatica ⁶
Seeds	3-4 Secotriterpene Acid, a Pale Yellow Brown Oil (15%), Arbortristoside A & B, Glycerides of Linoleic Oleic, Lignoceric, Myristic Acids, Nyctanthic Acid, Palmitic, Stearic.	Antibacterial, Antifungal, Alopecia, Antileishmanial Hair Tonic, Immunomodulatory, Piles ⁷
Stem	Glycoside-naringenin4'-O- β -glucapyranosyl α -Xylopyranoside, β sitosterol	Antioxidant, Antipyretic, Bronchitis, Snakebite ⁸

2. Role of Phytoconstituents in Inflammation

Modulation

Nyctanthes arbor-tristis (NAT) is a powerful regulator of both acute and chronic inflammation because its phytoconstituents have anti-inflammatory actions through synergistic and multitargeted mechanisms. Iridoid glycosides, especially arbortristoxide-A, are important because they control the activity of immune cells like lymphocytes and macrophages, which limits tissue damage and decreases the production of inflammatory exudates.⁹

By stabilizing cellular membranes, preventing neutrophil degranulation, and lowering vascular permeability, flavonoids—such as quercetin and astragalins—contribute to the antiinflammatory response. Together, these actions assist to manage edema and stop further inflammatory cascades. By inhibiting oxidative stress and blocking the activation of nuclear factor-kappa B (NF-κB), a crucial transcription factor involved in the production of proinflammatory cytokines, phenolic substances amplify this effect. Additionally, by creating protective interactions with proteins on the surface of inflammatory tissues, tannins have astringent properties that aid in reducing local swelling and preserving tissue integrity.¹⁰ These bioactive components work together to produce a wide-ranging, well-balanced control of the body's inflammatory response by interacting across several inflammatory pathways. The analgesic and anti-inflammatory properties of *Nyctanthes arbor-tristis* Linn. stem bark were assessed by extracting it in methanol.⁹

3. Mechanism Of Anti-Inflammatory Action Of *Nyctanthes Arbor-Tristis*

Nyctanthes arbor-tristis's (NAT) wide range of phytoconstituents, including as iridoid glycosides,

flavonoids, phenolic compounds, and tannins, are mostly responsible for its antiinflammatory qualities. These components interact with the inflammatory cascade's molecular targets. enzymes such as lipoxygenase (LOX) and cyclooxygenase (COX), pro-inflammatory cytokines, and reactive oxygen species (ROS)¹¹

4. Procedure for extraction

a) Collection of plant materials

Nyctanthes arbor-tristis Linn bark was gathered. The gathered materials underwent cleaning, shade drying, and coarse powdering. The plant material was ground into a powder and utilized for more research.¹²

b) Preparation of ethanol extract

Using a soxhlet system, the powder was extracted with ethanol in a 1:5 ratio for six to eight hours before being centrifuged. Whatman No. 1 filter paper was used to filter the supernatant from the centrifuged extract.¹³ After that, the filtrate was dried under low pressure at 37°C (not more than 40°C) until DMSO was added and stored. For further analysis, all of the extracts were kept in a desiccator.¹⁴

c) Qualitative analysis of phytochemical and screening

Nyctanthes arbor-tristis ethanolic extract was first screened for phytochemical components.¹⁵

CONCLUSION

Qualitative phytochemical analysis-

Medicinally active metabolites were found in the bark extract of *Nyctanthes arbor-tristis* L. Alkaloids, flavonoids, glycosides, and tannins were found in the bark extract's phytochemical



analysis, whereas steroids, terpenoids, saponin, carbohydrates, proteins, and amino acids were not.

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