INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: https://www.ijpsjournal.com

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Review Article

A Review On Phytochemical And Pharmacological Aspects Of *Nyctanthes Arbortristis*

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ARTICLE INFO

Received: 18 March 2024
Accepted: 22 March 2024
Published: 25 March 2024

Keywords:
Fragrance, Anti-inflammatory, Depressant, Saponins, Nyctanthes, Flavanol

DOI:
10.5281/zenodo.10886407

ABSTRACT

Since the ancient vedic period, green plants have been used for their medicinal properties to treat a wide range of illnesses. Nyctanthes arbortristis is a legendary plant of to the Oleaceae family, which has significant therapeutic properties in Ayurveda. Indian folklore claims that this plant is generally employed for religious purposes and is prized for its distinct scent and white orange flowers. Nyctanthes arbortristis is sometimes referred to as parijat or Harshringar. According to Hindu mythology, the Parijat tree sprang from the cosmic ocean that was churning during the Samudra Manthan. Legend has it that Lord Krishna brought the tree to Earth as a gift for his bride, Satyabhama. Today, people venerate the tree as a sacred symbol of fidelity and love. It is indigenous to Asia's southeast. Several phytochemical constituents such as, Flavanol glycosides, D-mannitol, β-sitosterol, Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, Ascorbic acid, Tannic acid, Phenolic compounds, tannins, cardiac glycosides, terpenoids, saponins, steroids, carbohydrates, proteins and alkaloids have been extracted from the plant. Now the pharmacological aspects, Leaves, bark, roots, and seeds are all crudely extracted and used in traditional medicine to cure a variety of ailments. Plant have analgesic, anti-inflammatory, anti-nociceptive, hepato-protective, antimicrobial, anti-fungal, anti-cancer, antidiabetic, anti-allergy, antioxidant, anticholinesterase, immunopotentiator, anti-filarial, anti-leshmanial, antiparasitic, CNS depressant, anti-anxiety, sedative, anti-anemic, anti-aggressive, antipyretic, ulcerogenic, anti-histaminic, anti-tryptaminergic, anti-malerial and immunostimulent activity. The goal of the current review is to gather current and thorough knowledge on Nyctanthes arbortristis, with a focus on its phytochemistry and range of pharmacological activities that have been scientifically proven.

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

INTRODUCTION

The tiny, holy Nyctanthes arbor-tristis decorative tree is well-known throughout the nation for its lovely scent and white-orange blossoms. Ten meters tall, N. arbor-tristis has rough leaves, immature branches, stiff, white hair, and flaking grey bark. It is one of the most well-known and beneficial medicinal plants and a member of the Oleaceae family. Because of its powerful, pleasant aroma that lingers throughout the entire night, it is also known as Night Jasmine or Harsinghar. After midnight, the blossoms begin to fall, and by daybreak, the plant looks lifeless. The Greek terms "Nykhta" (night) and "anthos" (flower) are the sources of the generic name "Nyctanthes."The tree's gloomy appearance led to the particular name "arbortristis," which translates to "the sad tree" [1].

Geographical Distribution

Around the world, Nyctanthes arbor-tristis is extensively grown in tropical and subtropical climates. It originated in Southern Asia. It grows in the Terai tracts, Burma, Thailand, and Ceylon, as well as the Himalayan ranges from Chenab to Nepal, Bangladesh, the Indo-Pak subcontinent, and South-East Asia. It grows in the outer Himalayas of India and may be found in areas of Jammu and Kashmir, Nepal, Bengal, Tripura, and the eastern part of Assam, extending through the central region to the Godavari region in the south [2].

Type of soil and surroundings for plant growth

This tree thrives in a range of loamy soil types, particularly those with a pH of 5.6 to 7.5 that are typically found in gardens. The plant has to be kept in settings that range from full sun to moderate shade, and it requires regular watering but not excessive irrigation [3].

The plant has names in a variety of colloquial languages

Hindi	Harsinghar
Sanskrit	Parijata
English	Night Jasmine
Bengali	Sephalika, Seoli
Gujarati	Jayaparvati,
Malayalam	Parijatakom

Taxonomic description

Kingdom	Plantae
Phylum	Tracheophytes
Class	Magnoliopsida
Order	Lamiales
Family	Oleaceae
Genus	Nyctanthes
Species	arbor-tristis

MORPHOLOGICAL DESCRIPTION

Leaves

The opposite, simple, whole or serrated, petiolate, exstipulate leaves are 5–10 cm in length and 2.5–6.3 cm in width. They are oblong, acute or acuminate, and have a hairy, 6-cm-long petiole. While the upper surface is dark green with dotted glands, the below surface is light green and softly pubescent. N. arbor-tristis has a reticulate venation [4].

Flowers

The tiny, deliciously scented blooms are grouped at the terminal ends of branches or in the axils of leaves. They are frequently observed in clusters of two to seven [5].

Stem and Bark

This large shrub might grow up to ten meters in height. The N. arbor-tristis plant has brown or dark gray bark [6].

Seed

Each cell contains a single compressed seed. Exalbuminous seeds contain a high degree of vascularization, a thick testa, and an outer layer of large, transparent cells [7].

Fruits

The fruit has a single seed within each flat, brown, heart-shaped to spherical capsule that has a diameter of around 2 cm [8].

TRADITIONAL USES

The leaves, bark, roots, and seeds of Nyctanthes arbor-tristis are all crudely extracted and used in traditional medicine to cure a variety of ailments.

The leaves have antibacterial, cholagogue, laxative, and diaphoretic properties. The N. arbor-tristis blossoms are used to induce menstruation. A sedative is made by infusing flowers in hot water. The flower promotes stomach secretions, enhances lung expectoration, and aids in the healing of mouth ulcers. Stem bark powder has historically been used to treat rheumatic joint discomfort. Seed powder is used to treat alopecia, scurvy on the scalp, skin conditions, and as an anthelmintic. Traditionally, roots have been utilized as an anthelminthic [9].

PHYTOCHEMICAL ASPECTS OF Nyctanthes arbortristis

N. arbor-tristis, contains phenolic compounds, tannins, cardiac glycosides, terpenoids, saponins, steroids, carbohydrates, proteins and alkaloids.

Phytochemical constituents from leaves

Benzoic acid, β-Sitosterol, hentriacontane, ascorbic acid, friedelin, nicotiflorin, nyctanthic acid, βAmyrin, mannitol, astringent, sugar, carotene, oleanolic acid, coloring materials, resinous substances, and traces of an oily substance, as well as astragalin, methyl salicylate, tannic acid, an amorphous resin, and traces of volatile oil are among the alkaloid nyctanthine [10].

Phytochemical constituents from flowers

β-digentiobioside ester of α-crocetin (or crocin-1), β-monogentiobioside ester of α-crocetin (or crocin-3), d-mannitol, nyctanthin, essential oil, monoglucoside ester of α-crocetin, glycosides, tannin, carotenoid, glucose, β-monogentiobioside [11].

Phytochemical constituents from Seeds

Octadecenoic acid, glicerides of alpha-linoleic acid, lindogeneric acid, and stearic acid these are major chemical constituents which are isolated from seeds of N. arbor-tristis [12].

Phytochemical constituents from Stem

Stem contains sitosterol, 4-0-beta-glucopyranosyl-alpha-xylopyranoside, and glycosides naringenin [13].

Phytochemical constituents from Root

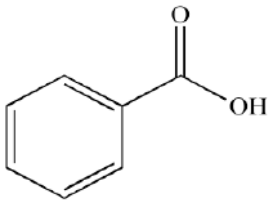
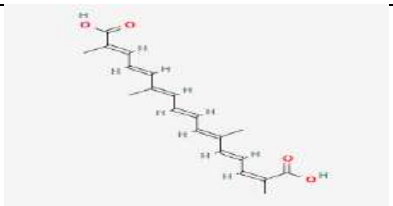
The root part of the plant composed of alkaloids, tannins and glucosides. β-Sitosterol and Oleanolic acid these are major chemical constituents which are isolated from the roots of N. arbor-tristis [14].

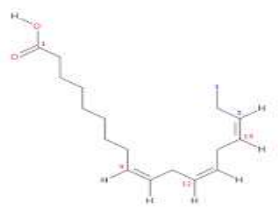
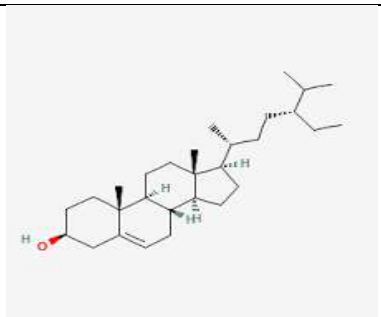
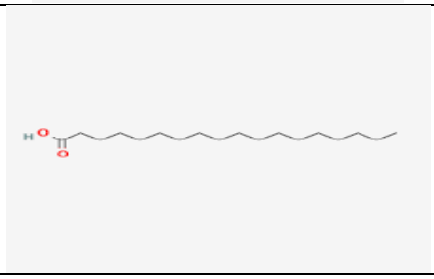
Phytochemical constituents from bark

The bark contains alkaloids and glycosides [15].

Fig-1 Nyctanthes arbortristis (Harshringar)

STRUCTURE OF SOME PHYTOCHEMICAL CONSTITUENTS EXTRACTED FROM NYCTANTHES ARBORTRISTIS

	Benzoic acid
	α-crocetin

	Alpha-linoleic acid
	β-Sitosterol
	Stearic acid

PHARMACOLOGICAL ASPECTS OF Nyctanthes arbortristis

Antimicrobial activity

It has been discovered that tannins and phenolic compounds in the ethanolic leaf extract are effective against Salmonella typhi and Staphylococcus aureus [16].

Analgesic activity

By comparing the analgesic efficacy of the aqueous and ethanolic leaf extracts of N. arbor-tristis to the standard medicine aspirin, the percentage inhibition index revealed that the ethanolic extract exhibited superior analgesic effect [17].

Hepato-protective activity

It was discovered that N. arbor-tristis leaves and seeds exhibited anti-hepatotoxic action when it came to hepatotoxicity caused by carbon tetrachloride [18].

Antifungal activity

It has been discovered that the stem bark extracts (ethanol, chloroform, and petroleum ether) may have antifungal properties against Aspergillus niger and Candida albicans [19].

Anti-inflammatory activity

The aqueous extract of the whole plant and alcoholic extract of stem and leaves reported to have acute and subacute anti-inflammatory activity [20].

Anti-Cancer activity

The in vitro anticancer properties of N. arbor-tristis were evaluated using methanol extracts of its leaves, fruits, and stems. It is anticipated that the glycosides, tannins, phenols, and steroids found in the dried fruit methanol of N. arbor-tristis are the phytochemicals with the anticancer properties [21].

Anti-Malarial activity

Clinical investigation on 120 malaria patients. Ninety-two (76.7%) patients had their illness

treated in just seven days after receiving a fresh paste made from five medium-sized N. arbortristis leaves, three times a day for seven to ten days. Eight patients did not react to therapy, while the other 20 patients were healed in 10 days [22].

Immunostimulent activity

An immunomodulator activity has been identified in N. arbor-tristis aqueous leaf extract [23].

Antianemic activity

Rats' hemoglobin content and red blood cell count increased dose-dependently when ethanolic extracts of the plant's flowers, barks, seeds, and leaves were used in a hematological study [24].

Anti-anxiety activity

Hydroalcoholic extracts of N. arbor-tristis have anxiolytic potential [25].

Antiallergic activity

Nyctanthes arbortristis has antiallergic compounds called arbortristosides A and C [26].

Anti-filarial activity

N. arbor-tristis plant have larvicidal activity against common filarial vector Culex quinquefasciatus [27].

CONCLUSION

According to a thorough review of the literature, N. arbor-tristis is a significant medicinal plant with a wide range of pharmacological uses. Numerous chemical compounds found in the plant are responsible for its diverse pharmacological and therapeutic properties. N. arbor-tristis has to be evaluated in order to formulate and employ the plant in actual therapeutic applications that may be used for the benefit of humankind.

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HOW TO CITE: Prabhu Dayal Rajan, Pradeep Kumar Sharma, A Review On Phytochemical And Pharmacological Aspects Of *Nyctanthes Arbortristis*, Int. J. of Pharm. Sci., 2024, Vol 2, Issue 3, 925-931. https://doi.org/10.5281/zenodo.10886407