

A REVIEW ON NYCTANTHES ARBOR-TRITIS ROOTS**Hemlata R. More*, Heera Karemore¹, Shubhangi Choudhari¹, Poonam Pardhi¹**

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DOI: <https://doi.org/10.5281/zenodo.17745995>**How to cite this Article:** Hemlata R. More*, Heera Karemore¹, Shubhangi Choudhari¹, Poonam Pardhi¹ (2025). A Review On *Nyctanthes Arbor-Tritis* Roots. World Journal of Pharmaceutical and Medical Research, 11(12), 46–50.

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Article Received on 23/10/2025

Article Revised on 12/11/2025

Article Published on 01/12/2025

ABSTRACT

Nyctanthes arbor-tristis Linn., commonly known as Night Jasmine or Parijat, is a medicinal plant widely used in traditional systems of medicine such as Ayurveda and Unani. The roots of *N. arbor-tristis* possess significant pharmacological potential due to the presence of various bioactive compounds, including alkaloids, flavonoids, glycosides, tannins, and saponins. Phytochemical investigations have revealed that the root extracts exhibit anti-inflammatory, antipyretic, analgesic, antimalarial, hepatoprotective, and antioxidant properties. Ethanolic and aqueous extracts of the roots have demonstrated promising effects in reducing fever, liver toxicity, and parasitic infections in experimental studies. The therapeutic potential of *N. arbor-tristis* roots supports its traditional use in the treatment of ailments such as arthritis, sciatica, and chronic fever. Further pharmacological and toxicological studies are essential to isolate active constituents and establish their mechanisms of action for possible drug development.

KEYWORDS: *Nyctanthes arbor-tristis*, Parijat, root extract, phytochemical, anti-inflammatory, antioxidant, traditional medicine.

INTRODUCTION

Nyctanthes arbor-tristis Linn., commonly known as Night Jasmine or Parijat, is a small ornamental tree belonging to the family Oleaceae. It is native to South Asia, mainly found in India, Nepal, and Bangladesh, and is also cultivated in tropical and subtropical regions for its beauty and medicinal value.

Herbs have been always the main principal form of medicine since traditions and now a days it becoming more popular form of medicine throughout the world. Herbal medicines are not only providing traditional and ethnic medicine but also promising for highly efficient novel bioactive molecules. Medicinal plants are a reservoir of various chemical compounds which serve as drugs and the potential source for newer lead molecule and clues for modern drug design by synthesis *Nyctanthes arbor-tristis* popularly known as Parijata or Night jasmine. Belongs to family Oleaceae. Latin name *Nyctanthes* has been coined from two Greek words Nykhta (Night), and anthos (flower). It is known as Parijata in Sanskrit, har-singhar in Hindi and night jasmine in english. During the day the plant loses all its

brightness and hence is called Tree of sadness or arbor-tristis. *Nyctanthes arbor-tristis* is commonly grown as a sacred tree in Maharashtra. It is also known for its medicinal cure by the aboriginals residing in this region. Leaves and bark are said to be antibilious and expectorant. Bark in combination with arjuna sadada is considered to be useful in internal injuries and healing of wounds including fractured bones. The decoction of bark is recommended for periodic fever. *Nyctanthes arbor-tristis* is one of the most useful traditional medicinal plants in India Each part of the plant has some medicinal value and is thus commercially exploitable. It is now considered as a valuable source of several unique products for the medicines against various diseases and also for the development of some industrial products. Every part of *Nyctanthes arbor-tristis* is used for medicinal purposes due to health benefitting properties. The present review includes comprehensive information on the chemical constituents, biological activities of important compounds, pharmacological actions, medicinal applications of Night jasmine and emphasizes the need for further exploring available information.

Taxonomy

Taxonomical Classification Kingdom:

Plantae Division: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Oleaceae

Genus: *Nyctanthes*

Species: *arbor-tristis*

Name: *Nyctanthes arbor-tristis*

USES**Leaves**

Used to treat fever, cough, cold, and malaria.

Possess antipyretic and anti-inflammatory properties.

Leaf juice is often given in chronic fever and arthritis.

Flowers

Used as a mild laxative and diuretic.

Employed in treating eye disorders, skin diseases, and respiratory ailments.

Used for preparing natural dye and fragrant oils.

Seeds

Traditionally used as an anthelmintic (expels intestinal worms).

Effective against skin infections and ringworm.

Bark

Used in spleen enlargement and gout.

Has anti-inflammatory and analgesic properties.

Roots

Useful in chronic fever, sciatica, rheumatism, and arthritis.

Exhibits antimalarial, hepatoprotective, and antioxidant activity.

Root decoction is used as a tonic and expectorant.

Other Uses

The flowers are used in making natural dyes for clothing and cosmetics.

The plant is grown as an ornamental tree for its fragrant night-blooming flowers.

It has religious significance in India, often used in offerings and rituals.

PLANT PROFILE

Nyctanthes Arbortritis Plant

GENERAL INFORMATION

Botanical Name: *Nyctanthes arbor-tristis*.

Synonym: Night jasmine, Coral jasmine.

Regional and Other name: Bengali- harsingar, Gujrati- jayaparvati, Kanada-Goli, tamil- manjhapa, Telugu- sepali, Hindi-seoli, Marathi-parijat.

Plant Family: oleaceae

Habit and Habitat: Rocky ground in dry hillside and as undergrowth in dry deciduous forest.

Flowering and Fruiting Time: August onwards.

Properties and Uses: *Nyctanthes arbor-tristis* uses in various ailments like fever, enlargement of the spleen,

malaria, blood dysentery, cough and gastritis, antidote to reptiles venom. seeds are used to cure scurfy infection of scalp, piles and skin.

PHYTO-CONSTITUENTS**Roots**

The roots of *Nyctanthes arbor-tristis* are rich in diverse phytoconstituents that contribute to its wide range of therapeutic properties. Major compounds identified include iridoid glycosides (arbortristiside A, B, and C), sterols (β -sitosterol, stigmasterol), flavonoids (quercetin,

kaempferol derivatives), triterpenoids (oleanolic acid, β -amyryn), phenolic compounds, tannins, and saponins.

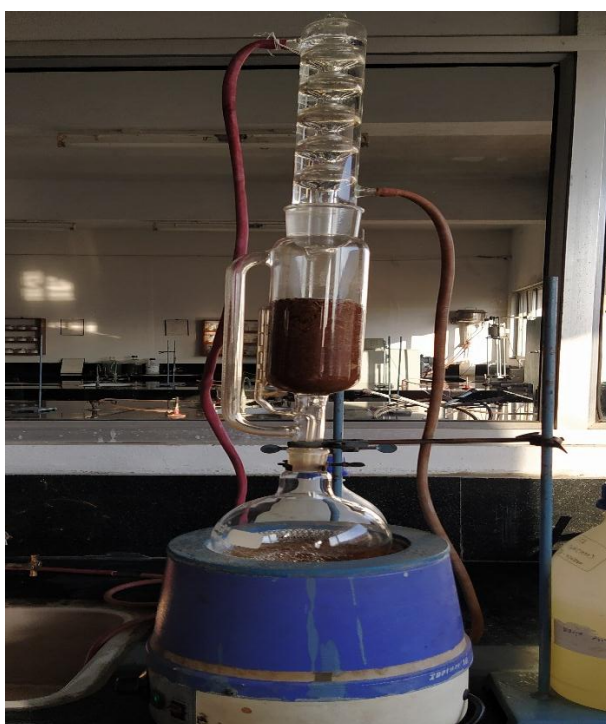
EXTRACTION

Extraction is a process used to separate or isolate active chemical constituents (such as alkaloids, glycosides, flavonoids, tannins, etc.) from plant or animal materials using suitable solvents. It is one of the most important steps in the preparation of herbal medicines and phytochemical studies, as it helps obtain the bioactive compounds responsible for the plant's medicinal properties.

EXTRACTION TYPE- SOXHLET EXTRACTION

Extraction of powdered root were carried out by Soxhlet apparatus using ethanol as a solvent. The root powder to be extracted was placed inside the thimble was loaded

into the main chamber of the Soxhlet extractor. The extraction solvent i.e., ethanol (500) ml placed in a distilled flask and the flask was place on the heating mantle. The Soxhlet extractor was placed on the top of the flask and a reflux condenser was placed on top of extractor and the soxhlation was done for 4 to 5 days. The Soxhlet was then equipped with a condenser. The solvent was heated and solvent vapour travel up a distillation arm and floods into the chamber housing the thimble of solid. The chamber containing the solid material slowly filled with warm solvent. When the Soxhlet chamber was almost full, the chamber was automatically emptied by a siphon side arm, with the solvent going back down to the distillation flask. This cycle was allowed to repeat many times over days. After extraction the solvent was removed by distillation.



Soxhlet extraction of Root



Soxhlet Extract of Root

Preliminary Phytochemical Test

Carbohydrates

Molisch's Test: Take 2-3 ml extract, Add Few drops Of alpha-Naphthol Solution, Add Conc. H_2SO_4 From Sides Of the test Tube. Violet ring is Formed at the junction of two liquids.

Protein

Biuret test -To 3 ml test solution, 4% sodium hydroxide and few drops of 1% copper sulphate solution were added. Pink colour appeared.

Amino Acid

Ninhydrin test - 3 ml test solution and 3 drops of 5 % Ninhydrin solution were added in boiling water bath for 10 min. purple colour appeared.

Steroids

Salkowski reaction - 2ml extract, 2 ml chloroform and 2 ml concentrated sulphuric acid were added and shaken well. Chloroform layer appeared red and acid layer has shown greenish yellow fluorescence.

Glycosides

Killer-Killian test -2ml extract, glacial acetic acid, one drop of 5% ferric chloride and concentrated sulphuric acid were added. Reddish brown colour appeared at the junction of the two liquid layers and upper layer appeared bluish green.

Saponins

Foam test -the drug extract or dry powder were shaken vigorously with water. Persistent foam observed.

Flavonoids

Sulphuric acid test -on addition of sulphuric acid (66% or 80 %) flavones and flavonoids dissolved into it and gave a deep yellow solution. Flavones gave red colour.

Alkaloids

The aqueous, alcoholic and chloroform extract were evaporated separately. To residue, dilute hydrochloric acid was added. Shaken well and filtered. With filtrate, following test were performed.

Dragendorff's test To 2 ml filtrate, few drops of Dragendorff's reagent were added. Orange brown ppt. was formed.

Phenolic Compound

Alkaline reagent test -To the test solution add few drops of sodium hydroxide solution, formation of an intense yellow colour which turns to colourless by the addition of few drops of dilute acetic acid indicate dark green colour.

Phytochemical Test	Results
Carbohydrate	+
Protein	-
Amino Acid	+
Steroids	+
Glycosides	+
Saponins	-
Flavonoids	+
Alkaloids	+
Phenolic Compound	+

(+) Indicates Present, (-) Indicates Negative

PHARMACOLOGICAL ACTIVITY OF ROOTS

1. Antipyretic Activity (Fever-reducing)

Root extracts have shown significant antipyretic effects, reducing fever induced by pyrogens in experimental studies. This supports its traditional use in chronic and malarial fever.

2. Anti-inflammatory and Analgesic Activity

The roots reduce inflammation and pain in conditions such as arthritis, rheumatism, and sciatica.

The activity is attributed to iridoid glycosides (like arbortristoxide A, B, C) and flavonoids which inhibit inflammatory mediators.

3. Antimalarial Activity

The root extract exhibits antiplasmodial (antimalarial) activity against *Plasmodium* species.

Traditional healers have long used root preparations for malarial and intermittent fevers.

4. Hepatoprotective Activity (Liver-protecting)

Root extracts protect the liver from toxic chemical-induced damage.

Flavonoids and triterpenoids (such as oleanolic acid) help in maintaining normal liver enzyme levels and prevent oxidative stress.

5. Antioxidant Activity

The roots are rich in flavonoids, phenolic compounds, and tannins which scavenge harmful free radicals.

This helps in preventing oxidative damage and enhancing immunity.

6. Antimicrobial Activity

Extracts of the roots show antibacterial and antifungal activity against several pathogens.

This supports their use in skin infections and wound healing.

7. Immunomodulatory Activity

Certain compounds in the roots enhance the body's immune response, helping to resist infections and improve overall health.

8. Anti-arthritis Activity

The anti-inflammatory and antioxidant compounds together help in reducing joint pain and swelling associated with arthritis and gout.

CONCLUSION

The roots of *Nyctanthes arbor-tristis* were successfully extracted using the Soxhlet extraction method, which efficiently isolated the plant's active constituents. Phytochemical screening confirmed the presence of iridoid glycosides, flavonoids, alkaloids, tannins, sterols, and triterpenoids. These compounds contribute to various pharmacological activities, including antipyretic, anti-inflammatory, antimalarial, hepatoprotective, and antioxidant effects. The study supports the traditional medicinal use of the plant and highlights its potential as a natural source for herbal drug development. Further studies are recommended to identify and purify the active constituents.

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