

Review Article

Harsingar plant and its species: Review on medicinal uses, therapeutics effects and its importance

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Abstract

Harsingar is called as Night Jasmine and Parijat (*Nyctanthes arbor-tristis*; family: Oleaceae). Ayurveda is an ancient medicine that relies on plants and their extracts to treat and manage several diseases. It contains a variety of phytochemical constituents such as alkaloids, glycosides, essential oils, tannins, and others. It's been said to help with sciatica, arthritis, fever, bronchitis, diabetes, and cancer, among several other things. Several investigations into its antibacterial, antifungal, antiproliferative, antiparasitic, antioxidant, and hepatoprotective effects are being conducted. It is one of India's most valuable traditional medicinal plants used mainly seeds, leaves, flowers and roots. Many different forms of research will be conducted to discover the specific vaccination that will stop the virus from spreading. However, no vaccination or particular treatment has yet to be developed, which is a significant source of concern around the world. The current review offers detailed data on the chemical ingredients, important chemicals' biological actions, pharmacologic properties, Night jasmine's therapeutic uses, and micropropagation, as well as a call for more research into the available data. Humans are in a state of terror as a result of the worldwide SARS-CoV-2 epidemic. Covid-19 viruses attack certain human cells via the cell membrane receptor's angiotensin-converting enzyme (ACE2) and quickly begin viral growth within the human body.

Keywords: Harsingar, Parijat, *Nyctanthes arbortristis* Linn (NAT), Night Jasmine, SARS-COV-2

Introduction

Nyctanthes arbortristis is also called "Harsingar" or "Night Jasmine" because its flowers have a very powerful and fragrant aroma comes lasts all night. Arbortristis, which means "sad tree," is thought to be derived from the tree's dreary appearance throughout (Kumari et al., 2018). The floral extract has been shown to have antispasmodic, antioxidants, antiparasitic, cytoprotective, anti-diabetic, anti-leishmanial, and CNS depressive effects in recent pharmacological trial (Tripathi et al., 2021). *N.arbor-tristis* Linn (Oleaceae), sometimes called "night jasmine" or "harsingar", is a well-known plant with medicinal properties. The liver is an active organ that generates and secretes bile as well as anticoagulation factors such as coagulation, fibrinogen, and heparin (Chaudhary et al., 2018).

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Severe acute respiratory syndrome corona-virus 2 (SARS-CoV-2), a super community spreader, has influenced people All throughout the world. The COVID-19 epidemic is the most important health and prosperity issue of our day, and the most significant problem we have faced this problem after World War II. Yet, no specific medicine or vaccine has been approved to fight the condition. COVID-19 is another name for the unique SARS-CoV-2 virus (Padhy, 2020). Powdered stem bark was traditionally used to treat rheumatoid arthritis, malaria and as an expectorant. *Nyctanthes arbortristis* Linn leaf is widely used in Ayurveda to treat a variety of ailments, including sciatic, persistent fever, rheumatic, and helminth, as well as cathartic, diaphoretic, and diuretics properties (Kumar et al., 2017). Because the blossoms lose their brightness during the day, *Nyctanthes arbortristis* is sometimes known as the "tree of sorrow"; Arbor-tristis is a scientific term that also means "sad tree". Blooms may be utilized to make yellow-coloured clothes. It is the state flower of West Bengal, India, as well as the Thai province of

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Table 1. Linnaeus system/taxonomic classification (Tripathi et al., 2021)

Kingdom	metaphyta
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Oleaceae
Genus	Nyctanthes
Species	arbor-tristis
Binomial name	<i>Nyctanthes arbor-tristis</i>

Table 2. Vernacular Names of Harsingar/ Trivial Name (Tripathi et al., 2021)

Sanskrit	Parijata, Parijatah, Parijataka, Sephalika
English	Night Jasmine, Coral Jasmine
Kannada	Harsing, Parijata, Goli
Malayalam	Mannapu, pavizhamalli, Parijatak
Punjabi	Harsinghar
Hindi	Harsingur, Sheoli, Harsinghar, Sihau, Seoli

Kanchanaburi (Jadhav and Kumar, 2016). In India, it can be found in the outer Tripura, East Assam, Nepal, Bengal, Himalayas, Jammu and Kashmir and from the Godavari in the south to the central area (Rawat et al., 2021). The night jasmine tree does not grow extremely tall. It has round seeds. It has very delicate and fragrant blossoms. By swinging its tree, its blooms fall to the ground. When someone smells night jasmine in the air, his mind becomes very joyful. When you put a dried stick of night jasmine blooms in water, it turns yellow. Its stick colour is utilised to make yellow in pharmaceuticals (Singh and Vyas, 2018).

Harsingar plant cultivation

Harsingar is found in tropical areas of the world. Though it blooms at night, this plant requires a lot of sunlight and cannot live in a frosty or chilly environment. It thrives in sandy soil that is wet and very well. It is unable to grow in saline soil. It is most commonly found in parts of Southeast Asia and Asia.

Climate

Night-blooming jasmine thrives in hot weather, so make sure you have enough! If you chose to plant indoors, make sure the temperature is at least 70 degrees Fahrenheit! It's also acceptable if you opt to plant outside! The night-blooming jasmine will freeze once winter arrives, but will reappear in the spring.

Soil

To grow night-blooming jasmine, choose one light, loose sandy

soil. If you're starting from seed, start with a tiny, shallow pot and transplant when the plant reaches a height of 4-6 inches. Plant night-blooming jasmine in a larger pot or directly into your garden if you start with a little plant (like from a nursery).

Sun light

Night-blooming jasmine adores the sun, so make sure your plant or pot is in direct sunlight! A windowsill is ideal for growing plants indoors.

Water

Water your night-blooming jasmine plant regularly, but don't over-water simply feel the soil around the plant and water it if it seems dry.

Fertilization

Because night flowering jasmine is self-sufficient and requires little maintenance, you shouldn't need any fertilizer. If you must fertilize, do it only once in the spring using a standard flower fertilizer (Singh and Vyas, 2018).

Morphology of harsingar

It's a common hardy huge shrub or tree that grows up to 100 feet tall and has flaking grey bark. Its spreading branches are tough, tetragonal, and scabrous. The harsingar leaves are alternate, simple, 2 to 6.5 cm vast, and 6 to 12 cm lengthy, with a full edge, scabrous above with bulbous-based hairs, and pubescent below. Each flower opens in the evening and close in the early morning, and the fragrant blossoms have 5 to 8 lobate white petal with an orange-red center. They bloom in groups of 2 to 7, with each flower opening in the evening and shutting in the early morning.

The fruits are two-part brown heart-shaped flat surface to a spherical capsule, each one containing a single seed, measuring 2cm in diameter. From late September through December, the tree begins to bloom, late-blooming flowers. *Nyctanthes arbortristis* is endemic to Nepal and India's subtropical Himalayas; it's more common in southern India and Southeast Asian countries like Thailand, Malaysia, and Indonesia.

Propagation and cultivation

It is grown in gardens virtually all over India, up to an elevation of 1500 meters, for its fragrant blossoms. It grows quickly in its natural habitat on dry big hillsides & rocky gardens. Seeds or seedlings can be used to propagate it. The plant thrives in a wide range of soil types and climates (Thokala, 2018).

Microscopy of different plant parts

Leaves: Leaves are oblong, acute or acuminate, whole and

with some big distant teeth, short bulbous hair rounded or slight acuminate, main nerves few, noticeable beneath, petiole 6 cm long, hairy. The ovate lamina has an acute or acuminate apex. The border is either whole or serrated, and it is slightly undulated near the base. The upper surface has a spotted gland, whereas the lower side is pale green and hairy. NAT has a venation that is uncostate and reticulate, having 12 lateral veins and a midrib on average. The petiole is typically 5 -7mm to 7.7 - 10mm long with axial concavity.

Flowers: Flowers are small, fragrant, and sessile in 3-5 fascicles of pendaculate bracteates; In short terminal trichotomous chymes, peduncles are four-angled, slender, hairy, auxiliary, & solitary. Bracts are roughly oval 6 to 10 mm long, apiculate, and both sides are covered in hair. 6 to 8 mm long constricted campanulate calyx Carolla glabrous, around 13 millimeter lengthy; tube 6 to 8 millimeter lengthy, orange in color, about the same length as the limb; lobes white, cuneate, unequally obcordate.

Fruits: Fruit's diameter capsule are 1 to 2 cm and are lengthy & wide, obcordate, compressed, 2 celled, and split into two uniform 1-seeded carpels that are reticularly veined and smooths (Kumari et al., 2018).

Chemical components of harsingar

Leaves: Alkaloid nyctanthine along with mannitol, benzoic acid, β -Sitosterol, hentriacontane, ascorbic acid, friedelin, nicotiflorin, nyctanthic acid, β Amyrin, lupeol, mannitol, astringent, sugar, carotene, oleanolic acid, coloring matters, resinous substances, and traces of an oily substance, astragaline, methyl salicylate, tannic acid, an amorphous resin and traces of volatile oil (Tripathi et al., 2021).

Flowers: Nyctanthin, d-mannitol, Flowers contain Essential oil, monoglucoside ester of α -crocetin, Glycosides, β -digentiobioside ester of α -crocetin (or crocin-1), β monogentiobioside ester of α -crocetin (or crocin-3), Tannin, Carotenoid, Glucose, β monogentiobioside.

Seeds: Lingnoceric acid, stearic acid, glycerides of alpha-linoleic acid, palmitic acid, octadecenoic acid, and methods such as reducing activity, hydrogen peroxide scavenging assay, and lipid peroxidation assay are all found in the seeds. In addition, different quantities of enzymatic and nonenzymatic antioxidants were calculated. RP-HPLC was also used to identify = polyphenols. Methanolic extract of dry flowers have a high phenols content and antioxidant activity, but water extract has a high enzyme and antioxidant activity, according to the findings (Jadhav and, 2016).

Bark: Glycosides and alkaloids are found in the bark.

Stem: The sitosterol, 4-O-beta-glucopyranosyl-alpha-

xylopyranoside, glycosides naringenin and are found in stems. Flower's Oil phenylacetaldehyde, 1-hexanol methyl heptanone, p-cymene, Alpha-pinene, 1-deanol, and anisaldehyde are all found in flower oil (Kumari et al., 2018; Bansal et al., 2014).

Geographical dispersal

Nyctanthes arbortristis can be found all over Southern Asia, from northern Pakistan and Nepal to northern India and southern Thailand. It increases as undergrowth in dry deciduous forests and on rocky soils on dry slopes. It grows in India's outer Himalayas, in areas ranging from Jammu and Kashmir through Bengal, Tripura, Nepal, and East Assam, and extending through the Central region to the Godavari River in the south. *Nyctanthes* prefer to grow in semi-shaded area (Kumari et al., 2018).

The Indo-Malayan region, Thailand, Burma, South Asia, Celon, and Southeast Asia are all-natural habitats for *N. arbortristis*. It can be found in India's outer Himalayas, in Jammu and Kashmir, Nepal to the east of Assam, Tripura, Bengal, and the Central region up to the Godavari in the south (Shrivastava and Bharadwaj, 2018).

Pharmacological applications

Immuno-stimulant activity

The aqueous leaf extract of NAT has been discovered to be a powerful immunomodulator, as indicated by humoral and cell-mediated reactions. Flower also possesses immunostimulant properties, which means it boosts the immune system mediated by cells. The root and seed ethanolic extort of NAT show an immune modulator effect towards Arbotristosides A and C, both iridoid glucosides, were extracted from the plant's seeds (Shrivastava et al., 2018).

Wound healing activity

Matadeen put NAT's wound-healing ability to the test on Wistar albino rats. For 16 days, the rats were given a 2 percent w/w NAT methanolic extract. The entire epithelization of both incision and excision sites took about 16 days, and the wounds were completely healed after that time. It was determined that a 300mg/kg dose of NAT extract is an effective treatment for both types of wounds.

CNS depressant action

Researchers employed water-soluble fractions of ethyl alcohol extracts from the plant's seeds, barks, flowers, and leaves to examine the plant's CNS depressing activity. A plant's leaves have already been determined to have hypnotic and tranquilizing properties, while its bloom possesses sedative properties. Adult male Swiss mice were

given an ethanol extract of the plant, and the extract was tested for pharmacological activity. Pentobarbital sodium-induced sleep extension in rats was used to assess CNS depressant action.

Anti-fungal activity

The Antifungal activity of various portions of the NAT plant was tested against three of the most common clinical pathogenic fungi: *Aspergillus Niger*, *Penicillium*, and *Aspergillus flavus*. Fresh and mature leaves, seeds, stems, bark, and flowers were gathered and dried, then extracted using distilled water, methanol, and chloroform. The extracts' antifungal activity was to find out to use the good diffusion method and expressed as a "zone of inhibition" of fungal growth. According to the finding, only distilled water extract of NAT stem and bark demonstrated antifungal action against *A. Niger*, whereas chloroform extract of leaves was only effective against *A. flavus*, according to the findings. Methanolic extract of NAT leaves, stem, and bark demonstrated the most potent antifungal activity against both *Aspergillus* and *Penicillium*, according to the study (Rawat et al., 2021)

Antiallergic activity

The distilled extract of *Nyctanthes arbortristis* leaves gave substantial anti-suffocation protection. Arbortristoside A and C, which are found in *Nyctanthes arbortristis*, are antiallergic (Shrivastava et al., 2018).

Anti-filarial activity

Culex quinquefasciatus, a common filarial vector, is killed by a trichloromethane (CHCl₃) elicit of the flowers and an isolated chemical purified from the NAT (*Nyctanthes arbortristis*) plant (Shrivastava et al., 2018).

Antioxidant and anti tussive aspects of *N. arbortristis*

Antitussives are the most widely utilized drugs on the planet, although a new class of drugs is not launched onto the market in many years due to the prevalence of cough. In the Indian Ayurvedic system, a water decoction of *Nyctanthes arbortristis* L. leaves are used to treat a variety of ailments, including cough. We used an aqueous extraction approach to separate a polymer of carbohydrate-containing fraction from its leaves. Carbohydrates polymer is a branching polysaccharide with 1,5-/1,3,5-linked arabinofuranosyl, 1,3-/1,3,6-linked galactopyranosyl, and 1,2/1,2,4-linked rhamnopyranosyl residues, among other things. In guinea pigs, orally administration of Carbohydrate polymer fraction at doses of 25 and 50 mg kg⁻¹ body weight significantly reduced the number of citric acid (C₆H₈O₇)-induced expectorate efforts. Surprisingly, CP did not affect the animals' particular airway resistance. As a result of the aqueous extraction process, a molecular entity with expectorate suppressive activity was produced. This could represent an appealing strategy in herbal

therapy (Kumar et al., 2017).

Nutritional Value of night jasmine

Carotene, fructose, tannic acid, Benzoic acid, ascorbic acid, methyl salicylate, amorphous resin, oleanolic acid, glucose, and flavanol glycosides are all found in Harsingar leaf. Because the flowers contain essential oils and glycosides, they are quite helpful. Palmitic, oleic, and myristic acids are found in the seeds. The alkaloids and glycosides found in the bark of this plant make it helpful. This flower's extracts have antifungal and antiviral effects. Apart from antileishmanial effects, it also has hepatoprotective and immunostimulant characteristics (Singh and Vyas, 2018).

To determine the activity of antioxidant and total phenolic content of *Nyctanthes arbortristis* L. methanolic leaves extract in vitro. The sample was examined in vitro using five basic extracts from various portions of the plant and shown to be effective in treating a variety of ailments. These reviews conclude that the time has come to put centuries of *Nyctanthes arbortristis* expertise to good use in modern medicine research. This will encourage scientists to learn more about the Harsingar plant's significant therapeutic potential to authentically establish the ancient Ayurvedic system (Kumar et al., 2017).

Uses of *Nyctanthes arbortristis* Linn

Flowers are traditionally collected for religious gifts and charplet. An orange heart are used to dye cotton and silk, a tradition that dates back to monks Buddhist who used it to tint their orange robes. The Parijata is one of Devaloka's five wish-granting trees, according to Hindu mythology. Its use in Sidha, Arabian, and herbal systems of medicine, different sections of NAT (*Nyctanthes arbor-tristis*) are called to possess specific illnesses through indigenous peoples of the Subcontinent of India (Jadhav and Kumar, 2016).

Therapeutic Uses

Coral Jasmine is a moderate purgative that is anti-inflammatory, antibacterial, bitter tonic, expectorant, and antibacterial.

1. Night Jasmine can help children who are constipated.
2. Bitter, astringent, ophthalmic, stomachic, and carminative blossoms.
3. Arthritis, fever, rheumatism, and other painful conditions are treated with the leaves.
4. Fresh leaf are fried in mustard oil and used to cure ringworm applied topically.
5. Intestinal worms are treated with leaf juice and ordinary salt.

6. Coral Jasmine is used to treating fungal skin infections, dry coughs, and bronchitis, as well as a snake bite antidote.
7. Seeds can be used to cure piles, baldness, and scurvy.
8. Gout is treated with an infusion of night Jasmine flowers.
9. Restlessness, headaches, gastritis, hepatitis, diarrhoea, vertigo, and dysmenorrhoea are all treated with coral jasmine (Kumari et al., 2018).

Different medicinal uses described as per modern literatures

- The leaves have a harsh, piquant flavour. It's used for the treatment of fevers, mycosis skin infections, and it's also an anti-inflammatory, and antihelminthic, antibacterial. Children are given embittered taste leaf extract to get rid of nematodes and threadworms leaves.
- Leaf sap is utilised as antivenin for reptile venoms and snake bites, as well as sciatica, rheumatism, and fever. The bitter and astringent blossoms are used to treat ocular problems and as a carminative.
- It's used for the treatment of recurrent sciatica, obstinate fever, and rheumatism. It helps youngsters with constipation because of its modest purgative properties.
- It's used for the treatment of acute bronchitis and as an antivenin for snake bites.
- The blooms are used medicinally in India, Malaysia, and Indonesia (Java) to induce menses.
- This tree's cortex is used to the treatment of eye disorders, ulcers, and as an expectorant. Gum bleeding can be treated with a bark decoction.
- *Nyctanthus arbortristies* seeds, leaves and flowers have hepatoprotective immunostimulant, antileishmanial and antimycotic properties.
- A new leaves of harsingar plant are often used in the preparation of homeopathic medicines (Hiremath et al., 2016).
- The aromatic blooms of the harsingar plant are used to manufacture a variety of perfumes and colours. Normally, a colouring agent is also used to dye cotton wool & as like a low-cost alternative for kesar in Buddhist priests' clothes.
- Fabrics are dyed by submerging them in a corolla tube decoction. They give off a yellow, lovely orange, or golden colour, similar to kesar, although the colour fades quickly in the light. Lemon juice or potash alum are added in the colorant bath to make the colour more persistent. The colour is thus light, soap, alkali, and acid-resistant to a moderate degree.
- The bark can be used to make leather, while the leaves can

be used to polish ivory or as sandpaper to make wood lustrous (Hiremath et al., 2016).

Conclusion

This review concludes that *Nyctanthes arbourtristis* is a source of metabolites such as flavonoids, phenolic alkaloids, tannin, and glycosides that are obtained from diverse portions of plants. For more than a century, harsingar used to treat various types of disorders such as antiepileptic, anti-HIV, anti-cancer, antioxidant, antiallergic, and anti-malaria. These medications have a lower level of toxicity than other pharmaceuticals. Although, the conclusion of this review is entirely convenient from the use of these plants as immunomodulators and starting therapeutic agents, during COVID-19, as well as to boost immunity.

Conflict of interest: Not declared

References

- Bansal S, Bharati AJ, Bansal YK. 2013. In vitro Callogenesis and Phytochemical Screening of Harisngar a Multipotent Medicinal Tree. International Journal of Pharmatech Research, 5(4):786-793.
- Chaudhary S, Gupta RK, Kumar A, Tarazi H. 2018. Hepatoprotective and antioxidant potential of *Nyctanthes arbor-tristis* Linn Leaves against anitubercular drug induced hepatotoxicity. Journal of Pharmacy & Pharmacognosy Research, 6(3):205-215.
- Sasmal D, Das S. 2007. Diuretic activity of *Nyctanthes arbortristis* Linn. Ancient Science of life, 27(2).
- Hiremath V, Hiremath BS, Mohapatra, Kumar Das A. 2016. Literary review of Parijata an Herbal Medicament with Special reference to Ayurveda and botanical Literatures Biomedical & Pharamacology Journal, 9(3):1019-1025.
- Jadhav S, Kumar Patil M. 2016. A review on: *Nyctanthes arbortristis* Linn. Rejuvenating herbs International Journal of Research in Pharmacy and Pharmaceutical Science, 1(1):54-62.
- Khatri P, Jamdagni P, Sindh A, Rana JS. 2016. Antimicrobial Potential of Important Medicinal Plant of India. International Journal of Multidisciplinary Research, 3(1).
- Kumar A, Rathi B, Tyagi V, Priyanka, Manisha. 2017. Systemic Review on Anti-Sciatica Plant "Night Jasmine (*Nyctanthes arbortristis* Linn.). International Journal of Current Microbiology and Applied Sciences, 6(6):1018-1035.
- Kaur J, Kaushal S. 2020. Chemical analysis, Antimicrobial and Antioxidant Activities of Harsingar essential oil Taylor & Francis. Journal of Essential Oil Bearing

- Plants, 23(2): 230-245.
- Ravishankar K, Satya Sireesha A. 2021. Exploration of antimicrobial and wound healing activity using ethnolic leaf extract gel of *Nyctanthes arbor-tristis* on rabbits Advancement in Medicinal Plant Research, 9(4):68-74.
- Kumari M, Lakshmi VB, Sravanthi V, Nagajyothi K, Desi Reddy RB, Sravanthi K. 2018. A Review of *Nyctanthes Arbor-tristis*. World Journal of Pharmaceutical Research, 7(7):429-435.
- Padhy M. 2020. A Review on Medicinal Plant *Withania somnifera* and *Nyctanthes arbortristis*: Boosting of Immune System During SARS-CoV-2. Letters in NanoBioScience 9(4):1538–1546.
- Rawat H, Verma Y, Saini N. 2021. A traditional herbal plant with miraculous potential end medicine. International Journal of Botany Studies, 6(3):427-440.
- Singh A, Vyas B. 2018. Night Jasmine (*Nyctanthes arbotristis*) RJJ, 10(4).
- Shrivastava R, Bharadwaj AK. 2018. *Nyctanthes arbortristis* an important Medicinal Plant of Madhya Pradesh State UK Journal of Pharmaceutical and Biosciences, 6(6):10-15.
- Thokala M. 2018. A literary review of *Nyctanthes Arbor-tristis* linn in ayurvedic classics World Journal of Pharmaceutical Research, 7(4):410-419.
- Tripathi A, Srivastav KS, Kumar Sk. 2021. Medicinal Properties of Harsingar. International Journal of Research & Technology, 9(1).