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AN OVERVIEW ON ETHANO-PHYTOPHARMACOLOGICAL PROFILE OF *NYCTANTHES ARBORTRITIS* LINN

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ABSTRACT

Background: This review emphasize on the pharmacognostic, phytochemical and pharmacological profile of "*Nyctanthes arbortritis* L". **Method**: All the available information on *Nyctanthes arbortritis* were collected from published articles. Report: According to this article reports related to scientific evidence, *Nyctanthes arbortritis* is used for various treatment. Crude extract of plant are reported to contain 2,3,4,6- tetra-O-methyl-D-glucose; 2,3,6 tri-O-methyl-D-Mannose;2,3,6 tri-O-methyl-D-glucose;2,3,di-O-methyl-D-Mannose; Arbortritiside-A, B, C & iridoid glycosides, stigamasterol,fatty acids, Nyctanthin, tannins, carotenoids, nyctanthic acid, ect. Which are broadly used for therapeutic purpose.Conclusion: This article summarizes that night jasmine is pharmacologically active and it is used for treatment of various ailments.

Keywords: ***Nyctanthes arbortritis*** **linn, night flowering jasmine, Sad tree**

INTRODUCTION

Nyctanthes arbortritis linn called night jasmine (family: oleaceae) **[1]**. This plant sometimes known as "Pavala malligai," is very important in India **[2]**. India has a large variety of medicinal plants. More than 50,000 flowering plants with medical and pharmacological properties have been identified. Because of the existence of several chemical compounds that conduct multiple vital physiological tasks, the plant is classified as a bio-metabolite **[3]**. A term Nyctanthes derives from Greek word "Nykhta-night" & "anthos-flower" **[4]**. The plant is widely cultivated as a decorative shrub in warm climates around the world **[5]**. N.arbor-tristis Linn in its entirety. Has medical properties in one form or another. Folk knowledge is prominent among the local tribes **[6]**. Various parts of the plants have indeed been employed as folklore remedies **[7]**. Nyctanthes arbor-tristis was being used as a digestive, diuretics, anti-venom, cathartic, moderate bitter tonic, and expectorant in Vedas, Siddha-Ayurveda, and Yunani health care systems **[8]**. Because the blossoms lose their brightness during the day, the tree is commonly referred to as the "tree of sorrow," and the scientific term arbor-tristis also means "sad tree" **[9]**.

Distribution:

Arbortritis species were distribution in northern Pakistan and Nepal and are thus indigenous to South Asia.Northeastern India, Indonesia, and Thailand are also good places to look for it **[10]**. It fills in the external Himalayas and in spaces of Jammu and Kashmir, Nepal, Eastern Assam, Bengal, and Tripura, just as the focal region up to the Godavari in the south of India **[11]**. It tends to be found in the external Himalayas and portions of Jammu and Kashmir, Nepal towards the east of Assam, Bengal, and Tripura, just as the focal district of India up to the Godavari in the south. It inclines toward parched and semi-dry ecological conditions and flourishes in red and dark soils with a ph level of 5.6–7.5 **[12]**. That plant can be tracked down developing as undergrowth in dry deciduous woodlands and on alluvial soil in dry slopes.

Taxonomical system: [13]

Kingdom - Plantae

Division - Angiosprem

Class - Eudicote

Order - Laminals

Family - Oleaceae(Nyctaginaceae)

Genus - Nyctanthes

Species - Arbor-tritis.

Synonym: "Bruschia macrocarpa,Nyctanthes dentata,Nyctanthes tristis,Parilium arbor - tritis,Scabrita scabra Linn". **[14]**

Botanical features:

Nyctanthes arbor-tristis linn is an evergreen, sluggish tree. It is a terrestrial woody perennial plant with a lifespan of 5–20 years that grows up to 10 metres tall **[15]**.

- The bark of the plant is dim or brown in shading and is unpleasant and firm.
- Flowers are small and fragrant with slender, hairy and short trichotomous cymes.
- Corolla glabrous, with corolla tube orange in colour.
- The flowers with six petals are easily visible but five, seven, eight and nine petaled flowers are rare **[16]**.
- It grows well in loamy soil.

The leaves are opposite, oval or acuminate, and have an entire or serrated edge. Petioles are lengthy and hairy, measuring 5-7 to 7.7-10 millimeters in length and with an axial concavity **[17]**. Venation is reticulate and unicostate. Lamina is elliptical in shape, with a pointed or acute apex. Flowers are modest and fragrant **[18]**. Calyx 6-8mm long, barely campanulate, bracts extensively oval 6-10 mm long, apiculate, bristly on the two sides **[19]**. The corolla tube is orange in colour, and the corolla is glabrous.Six-petaled flowers are common, but five, seven, eight, and nine-petaled flowers are uncommon. The fruits are heart-shaped, flat, brown, and have two portions, each with a solitary seed. It thrives on loamy soil **[20]**. The seeds are exalbuminous, compact, and have thick testa. The outer layer is a thick, translucent, and vascularized layer. Bark is harder and firm, and it's dark grey or yellow - brown. Due to scaling off of the round barks, the surface of the bark is dippled and patchy, with grey brown colour patches. The inner bark is creamy white in colour, velvety, and has a clearly visible phloem zone that is both collapsed and non-collapsed **[21]**.

Figure 1: Botanical features of *Nyctanthes arbortritis Linn*

Vernacular names: [22]

1. English- coral jasmine, night jasmine.
2. Hindi - Harshinghas.
3. Tamil- pavala malliagai.
4. Sanskrit- parijath, sephalika.
5. Telugu- kapilangadustu, parijat.
6. Kanadam- Goli, parijata.

Ethano-medicinal uses: Different parts of *Nyctanthes arbortritis* linn have been used against many illness and issues in Folkmedicine.

Table 1: Folkmedicinal values of *Nyctanthes arbortritis* linn

S. No	Plant parts	Folks uses	Ref
1.	Leaves	Sciatica, rheumatic arthritis,Anti-pyretics, anthelmentics, laxative, Diuretics	[23]
2.	Barks	Antivenom, bronchitis	[24]
3	Stem	To cure malaria, internal injury	[25]
4	Flower	Carminative, astringent, antibiotic, hair tonic, to cure piles.	[26]
5	Seed	To stop hair fall, skin problems, Act as expectorant and used to relief constipation.	[27]

Therapeutic utilization:

Nyctanthes arbor-tristis plants are used to cure symptoms such as sciatica as well as rheumatoid arthritis. Their leaves are also used to cure intestinal worms and prolonged fever. The leaves contain laxative, diaphoretic, and diuretic properties **[28]**. Osteoarthritis, insect bites, and bronchitis all are cured with bark. Internal injuries and dislocated joints are cured by massaging the body using powdered stem bark **[29]**. Flowers are widely used to treat stomach aches. They're used it as a digestive aid, astringent, antibiotic, expectorant, hair tonic, and to cure piles and some other skin problems. The flowers were employed in ophthalmic procedures **[30]**. Alopecia, expectorant characteristics, constipation, and gastrointestinal problems are all treated with seeds **[31]**.

Phyto-constituents profiles:

As qualitative reports of phytochemical screening of species-Arbor-tritis flower, and other parts of plants have been reviewed, they show that terpenoids, terpenoids, glycosides, saponins, alkaloids, phenols, steroids, tannins and fatty acids are observed **[32]** from various sources and the chemical components are tabulated below.

Table 2: Phytochemicals- Nyctanthes arbor-tristis Linn

S. No	Parts	Phyto-constituents	Ref
1	Plant:- (2,3,4,6- tetra-O-methyl-D-glucose); (2,3,6 tri-O-methyl-D-Mannose); (2,3,6 tri-O-methyl-D-glucose); (2,3,di-O-methyl-D-Mannose); Arbortritiside-A, B,C & iridoid glycosides		33
2	Leafs	Nyctanthic acid, D-mannitol, Beta-sitosterol, flavanol Glycosides, iridoid Glycosides.	34
3	Flowers	Nyctanthin, tannins, carotenoids,[Beta monogentiobioside ester of alpha crocetin](crocin-1&3).	35
5	Seeds	Arbortristosides A & B, fatty acid lignoceric, stearic,plamitic&myristic acid, (3,4-secotriterpene acid).	36
6	Bark	Glycosides and alkaloids	37
7	Oil-flower	Alpha-pinene, P-cymene,1-hexanol, Anisaldehyde,Methylheptanone.	38

8	Stem	[Naringenin-4-O-Beta glucopyranosyl-alpha-xylopyranoside] & Beta-sitosterol.	39

PHARMACOLOGICAL PROFILE:

1. Anti-bacterial activity:

Essential oils from the leafs & bark of Nyctanthes arbor-tristis have an antibacterial activity, as indicated by Satyal P *et al*. Unpredictable oils, phenolic synthetic compounds, and iridoids were found in botanical concentrates in different investigations. Cell reinforcement limit was found in the pet ether and diethyl ether portions. Oil ether and diethyl ether, among the portions inspected for antibacterial movement, have unassuming antibacterial action against both gram(+ve) and gram (-ve)microorganisms. No antifungal movement was found in any of the divisions tried **[40]**.

2. Antihyperglycemic activity :

Husain A *et al*. examined leaves extract at dosages of 200 mg/kg body mass and 400 mg/kg body weight for fourteen days on alloxan-induced diabetic rabbits. The hypoglycemic impact of the leaf extract was compared to Glibenclamide(GLBCM) at a level of 2.5 mg/kg body mass. At 200mg/kg body mass, the hypoglycemic effect of Nyctanthes arbor-tristis leaves extract wasn't really substantial, but at 400mg/kg body mass, it was substantial and comparable to GLBCM **[41]**.

3. Anti arthritic activity:

Active toxicity ingredients in leaves 95 percent ethanolic extract will be extracted and the underlying mechanism of action will be examined by in vivo method (albino rats).Ethyl acetate extract of leaves was tested in test animals using an invivo approach. It is necessary to isolate the responsible phytoconstituents and establish their antiarthritic action **[42]**.

4. Analgesic activity :

According to saxena RS *et al* and pattayanak C *et al*.95 percent ethanolic extract of leaves Supported its utilization in different fiery conditions according to the Ayurvedic arrangement of medication, Additionally, 90% ethanolic remove Showed promising outcomes in the intense model rather than the ongoing model, as indicated by pattayanak C *et al*. More human preliminaries are expected to exhibit long haul security and adequacy **[43]**.

5. Anti-viral activity :

- Using ethanolic extricates, various parts, and two unadulterated mixtures confined from the plant N. arbortris, Encephalomyocarditis Sepsis and Semliki Woodland Infectious disease were tested. Ethanolic extract and otherwise n-butanol component

protected mice from EMCV infection by 40% and 60%, respectively **[44]**.

- Rodents were given an ethanolic concentrate of Nyctanthes arbor-tristis for humoral and cell-interceded safe reactions. When tested using sheep RBC and heat-killed Salmonella antigens, NAEE significantly improved the flowing neutralizer titre **[45]**.
- A significant increase in phagocytic file, leukocyte count, and spleenic neutralizer discharging cells was seen after Nyctanthes arbor-tristis was organised. With the heamagglutination immune response titer, there was also excitement of the humoral safe reaction **[46]**.

6.Hepatoprotective activity :

- Acetaminophen poison levels is accepted to be advanced by oxidative pressure during the occasion of overdosage. NAT leaves can keep hepatic wounds from APAP actuated through forestalling the decrease of glutathione level, a review has shown **[47]**.
- Folwers of arbor-tristis showed antibacterial action against gram (+ve) and gram (-ve)microbes in chloroform and ethyl acetic acid derivation extricates, just as solid cytotoxic activity in oil ether, chloroform, and ethyl acetic acid derivation separates **[48]**.

7. Anti Filariasis:

- The disengagement of a novel iridoid glucoside was triggered by an ethanol extract from the plant's blooms. The antiplasmodial activity of Constituent 1 and its acetic acid derivation subordinate was observed against *P. falciparum* **[49]**.
- The antifilariasis activity of 44 plant alcoholic concentrates was tested against the Plasmodium berghei NK 65 strain. Schizontocidal movement was discovered in Nyctanthes arbor-tristis (half or more) **[50]**.

8. Anti malarial activity:

- Open mark clinical review was done on 21 smear-positive patients of Plasmodium vivax intestinal sickness. Important bodily functions and manifestations of intestinal sickness as internal heat level, cold felling/afflictions, cerebral pain, body throb, queasiness/heaving and sickliness were recorded before therapy, and later therapy **[51]**.
- Iridoid glucosides extracts from Nyctanthes arbortristis, lead to an

increment in receptive oxygen species by repressing a significant protein of redox digestion of the parasite. Expanded ROS level prompts oxidative pressure, cell layer harm and apoptosis of *Leishmania* sp **[52]**.

- Nyctanthes arbor-tristis Linn. - (Parijat) is an Ayurvedic plant that has shown antimalarial activity in clinical trials. Fever and parasite clearance were seen in ten out of twenty patients, as validated by polymerase chain reaction **[53]**.

9. Larvicidal activity:

- Crude chloroform, dichloromethane, and methanol extracts of the leaves and roots of six Indian plants have larvicidal action. This is an excellent environmentally friendly mosquito control method for Aedes aegypti and Aedes stephensi **[54]**.
- The anti-Malassezia potential of Nyctanthes arbor-tristis extracts is primarily driven by disruption of the plasma membrane. Mala s1 could be a therapeutic target in the future. The findings lay the groundwork for the development of new therapeutic approaches based on NAT extract **[55]**.

10. Anti fungal activity:

The use of aqueous flower extract of Nyctanthes arbor-tristis in the manufacture of zinc oxide nanoparticles is described in a study. The biological reduction agent employed to make zinc oxide nanostructures from zinc acetate dihydrate was flower extract **[56]**.

11. Anti spermatogenic action:

Male albino rats were given a methanol extract of N. arbortristis stem bark orally for 60 days. The weight of the testes and other reproductive organs was significantly reduced as a result of the treatment. Sperm motility and density both decreased, resulting in total fertility reduction **[57]**.

12. Anti ulcer property:

Nyctanthes arbortristis Linn is generally known as Harsingar and Night Jasmine in the sub-Himalayan areas and southwards to Godavari, India. In experimentally created ulcer models such as cold restraint stress and alcohol-induced models, two of its seeds have showed anti-ulcer action **[58]**.

13.Bronchodilation properties:

In Sri Lankan traditional Ayruvedic medicine, boiled aqueous extract of flowers (AEF) from Nyctanthes arbor-tristis L. is used to treat diabetes mellitus. AEF reduced glucose absorption by 85 percent in the gut and increased glucose uptake by 64 percent in the diaphragm **[59]**.

14. Anti diarrheal activity:

19 plants have recently been identified as having ethnomedicinal applications in the treatment of diarrheal illnesses. Antibacterial activity was investigated in aqueous and methanol extracts of 72 plants. The most susceptible strains were Salmonella typhi, Escherichia coli, and Vibrio cholera **[60]**.

CONCLUSION:

This paper covers a constrained portion of information on Nyctanthes arbor-tristis linn's pharmacognostic, phytochemical, and pharmacological investigations. Arbortritis species are utilised for various treatments, according to this article report based on scientific evidence. [2,3,4,6-tetra-O-methyl-D-glucose; 2,3,6 tri-O-methyl-D-Mannose; 2,3,di-O-methyl-D-Mannose]; Arbortritiside-A,B,C & iridoid glycosides; stigamasterol, fatty acids, Nyctanthin, tannins, carotenoids, nyctanthic acid, ect. This article illustrates that nyctanthes arbor-tristis does have anti-diabetic, Anti-arthrtic, ucler healing action, anti malarial, hepatoprotective, anti-viral , and antifungal properties and is used to treat a variety of ailments.

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Conflict of interest :

The authors proclaim that NO irreconcilable situation among us.

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