



HERBAL REVIEW ON NYCTANTHES ARBORTRISTIS LINN

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ABSTRACT:

Nyctanthes arbortristis is one of the most useful traditional medicinal plants. All parts of the plant include leaves, flower, fruit, seed, stem and bark have valuable in medicine to treat various diseases such as skin infections and diuretic. It is also useful in the production of industrial products and medical products. It contains the chemical constituents such as alkaloid, phenol, glycoside, protein, essential oils, flavonoid, tannic acid, glucose, benzoic acid which are very useful in, antileishmaniasis, antiviral, antipyretic, antispasmodic, antihistaminic, antimalarial, antifungal antibacterial, hepatoprotective, anticancer, antidiabetic and antioxidant activities. This review article is a way to record information about *Nyctanthes arbor-tristis* includes the phytochemical test, traditional uses and proved pharmacological actions. Articles published on this plant highlighted the need for research and their potential development.

Keywords: *Nyctanthes arbor-tristis*, night jasmine,

INTRODUCTION

Nyctanthes arbor-tristis linn common name is known as Night jasmine. The flowers that can emit a very strong and pleasant fragrance during night are one the characteristic of this plant. [1] The another name of arbor-tristis is "tree of sorrow" because of the flowers start falling after midnight and appear as dull by the day break, the flowers lose their brightness during daytime.[1][2] It is also called as "Queen of the Night".[1][2] In tropical and subtropical regions, *Nyctanthes arbor-* Linn are commonly found. It is a large shrub or a small tree growing to 10 m tall, with flaky grey bark. The life span of this plant is 5 to 20 years. The plant is tolerant to moderate shade and can grow on rocky ground in dry hill shades, dry deciduous forests. It is also can grow at sea-level up to 1500 m altitude with a wide range of rainfall patterns.[3][4][5]

DIFFERENT PARTS OF NYCTANTHES ARBORTRISTIS

Leaves:

The leaves are simple, petiolate and exstipulate. It is 6-12 cm long and 2-6.5 cm broad. Leaves are opposite, ovate or acute with a few large distant teeth, short bulbous hairs rounded, conspicuous beneath and hairy.[3]

Flowers:

The size of the flower is small, often seen in clusters of 2-7 together. The flowers appear as 5 to 8 lobed

white corolla with an orange red centre, corolla glabrous rather more than 13 mm long, tube 6-8 mm long. The flowers are fragrant.[3][6]

Fruits:

The fruit is brown colour, flat, heart-shaped and round capsule in which the diameter is 1 to 2 cm. There are 2 sections which one of each contains a single seed. The fruits microscopically show that the polygonal cells with slightly anti-clinal walls covered by a thin cuticle followed by 1-3 layers of collenchyma, epicarp epidermal cells were compactly arranged.[6][7]

Seeds:

Seeds are exalbuminous, the testa is thick, the outer layer of large transparent cells and heavily vascularized. [3][8]

Stem and Bark:

The colour of the bark of *Nyctanthes arbortristis* is dark gray or brown. The surface of the bark is diphled due to scaling off of circular barks and the barks is rough and film. Inner of the bark is creamy white in colour and soft. The stem of *Nyctanthes arbortristis* processes herbal benefit and the colour is brown. [3]

PHYTOCHEMICAL CONSTITUENTS

There are many chemical constituents in different chemical classes such as steroids, terpenes, flavonoids, carbohydrates, glycosides, alkaloids and others have been isolated and identified from various parts of *N. arbortristis*. [1][3]

Mannitol, astringent, resinous substances, ascorbic acid, coloring matters, sugar and traces of an oily substance, tannic acid, methyl salicylate are found in the leaves of this plant.[3] Leaves also contain three

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new benzoic esters of Loganin and 6- β -hydroxyloganin, namely Arborside-A, Arborside-B, and Arborside-C. From leaves of *N. arbortristis* 10-Benzoylnyctanthoside named as Arborside-D are isolated.[10] These possess immunomodulatory and anti-leishmanial activities.[3]

The iridoidarbortristoside A has been found that it has anti-proliferative activity. The extraction of leaves is widely involved in the treatment of arthritis which is used in ayurvedic medicine. [11]

The fresh flowers of *N. arbortristis* which extract with ethanol will tend to isolate a Rengyolone, a new iridoidglucoside 6-O-trans-cinnamoyl-7-O-acetyl-6- β -hydroxyloganin and three known iridoidglucosides, Arborside-C, 6- β -hydroxyloganin and Nyctanthoside. Rengyolone is also known as an antimalarial cyclohexylethanoid which is active against *Plasmodium falciparum*. [10, 11] Flowers of this plant has been isolated to have a benzofuranone, 3,3a,7, 7a-tetrahydro-3a-hydroxy-6(2H)-benzofuranone which have significant antibacterial activity against both gram positive and gram negative bacteria.[12]

The stem chromatographed the chloroform extract of the stem over silica gel column has screened a glycoside Naringenin-4'-O- β -glucopyranosyl- α - and reported the presence of β -Amyrin, arbortristoside-a, oleanolic acid, nyctoside-a, nyctantic acid and 6- β -hydroxyloganin.[3,10] Naringenin, a flavonone is isolated to contain several activities such as antiviral, antioxidant, and anticarcinogenic.[13] Naringenin is principally present in glycosidic form as naringenin-7-rhamnoglucoside (naringin).[13]

Arbortristoside A&B, Glycerides of linoleic acid, oleic acid, lignoceric acid, stearic acid, palmitic and myristic acids, nyctanthic acid, 3-4 secotriterpene acid, a water soluble polysaccharide composed of D-glucose and D-mannose, which indicating that the polysaccharide is a glucomannan. All of the above are chemical constituents that present in seed of this plant.[3, 5] Besides, arbortristis that present in *N. arbortristis* also contains two minor iridoidglucosides, arbortristoside-D and arbortristoside-E together with the previously reported arbortristoside-B. Other iridoidglucoside is phenyl propanoidglucoside.[3]

The root part of the plant possesses alkaloids, tannins and glucosides. Other than that, β -Sitosterol and Oleanolic acid has been isolated from the chloroform extract of the root.[10] *Nyctanthes arbortristis* subjects to various pharmacological studies by isolating a flavones

glycoside from its bark. The glycoside is found to be effective on cardiovascular system and smooth muscles of intestine but not effective in CNS. The glycoside exhibited promising anti-inflammatory activity.[5]

TRADITIONAL USES:

Nyctanthes arbor-tristis Linn has another name: Harsingar. It is known as night jasmine in English. Harsingar is small ornamental tree with fragrant white flowers. According to Hindu Mythology, Harsingar, which is the tree brought by Bhagwan Shri Krishnan from heaven for his beloved wife Satyabhama. It is a divine tree with various uses. Flowers are collected for religious offerings and to make decorative wreath.

Hindu devotees use orange heart for dyeing silk and cotton, an activity commenced by Buddhist monks.[14] Different illnesses are treated by various parts of *Nyctanthes arbor-tristis* Linn by Indian tribes as recorded in Ayurvedic, Sidha and Unani systems of medicines. [14]

Flower:

The floral part can cure arthritis. These flowers put in the face packs can put on skin to give glowing skin. Their sweet smells make a great mood throughout the day. *Nyctanthes arbortristis* flowers are bitter, astringent, carminative, stomachic and used in ophthalmic purposes. They are also used as a tonic to the hair in preventing hair graying and baldness. Traditionally, menstruation can be induced by this flower.[16]

The flowers are believed to be antimicrobial, larvicidal (devastate the larvae) and found toxic in brine shrimp lethality bioassay.[17] Besides, crush the flower and add them to curd can eradicate the dark circles under the eyes. This is a cosmetic purpose useful to the peoples who tend to sleep late in night. Apply the mixture to the affected area, beware of the mixture not to enter into the eye, leave for ten minutes and rinse off.

For treating haemorrhoids and numerous skin diseases and eye infection, the flower is applied as appetite promoter, relieving flatulence, expectorant, astringent to bowel and antibilious. Nyctanthin contain in bright orange corolla tube of flower, which is similar to alpha-Crocetin from Saffron. Corolla tubes previously is using together with Safflower or turmeric to dye silk.[5]

Stem:

Stem bark and leaf decoction is prescribed to control of remittent fever and blood sugar. Traditionally rheumatic joint pain is treated by powdered stem

bark.[5] Besides that, same bark can cure malaria, bite of snake, bronchitis and also used as an expectorant. Rheumatic joint pain and malaria can be cured by powdered stem bark. Zingiberofficinale and Piper Longum combine with stem bark, boiled in water and the final liquids taken 2 days for the treatment of malaria. Arjuna bark and paste is applied on body to cure internal injury and broken bones.[5][8]. Apply leaves paste on infected area by ring worm (which is a traditional direction).

Leaves:

The leaves are useful for the treatment of different illness for example sciatica, chronic fever, loss of appetite, rheumatism, intestinal worm infections.[5] Leaves can kill the fungus by just grind the leaves and apply to fungal part. This is called antifungal action. Three grams of barks and two grams of leaves soaked in water and left to boil, drink the water two times per day. The leaves can be laxative, diaphoretic and promote urine production. Ayurvedic physicians use leaf decoction extensively for the treatment of arthritis, obstinate sciatica, malaria and intestinal worms. For sciatica, grind 3-4 leaves and boil in water. Drinks two times daily till recover.

Leaves are used to reduce cough and leaf juice mix with honey and given three times per day to treat cough and in the enlargement of spleens. Potential anti-malarial activity has also been approved to associate with Nyctanthes arbor-tristis Linn leaves. Honey with leaf paste can use in treating fever, hypertension, and diabetes mellitus. Leaves juice used to cure Rheumatism, malaria, bilious fever, diabetes, hypertension, cold and cough, given for fever in irregular intervals and discontinuous.

Leaf juice with honey, treat fever and cough efficiently with three times a day. Leaves juice with a dose of 10 ml, two times a day for five days In addition, it plays the role as digestives, antidote to reptile venoms, diaphoretic ,diuretic, piles, liver disease, biliary disease, cholagogue, infection by intestinal worms, high fever , obstinate sciatica. Moreover,The extracted juice of leaves acts as a laxative and mild bitter tonic. Extracted juice of leaves are given with small amount of sugar to children act as laxative, mild bitter tonic, and as a remedy for intestinal ailments.^[16]

Seed:

PHARMACOLOGICAL ACTIVITY:

This plant has many proved pharmacological actions, has been listed in table 2.

The seeds are applied to treat hair loss and are anthelmintics. Seeds are antibilious and expectorant, and for curing billous fevers. The powdered seeds cure infectons of scalp, piles and skin diseases.^{[5] [8]}

To get rid of piles, crush the seeds and mix with water and apply on piles. The decoction of seeds is used as hair tonic and use this hair tonic to wash hair daily can solve the problem of dandruff and lice.

Other uses:

Furthermore, night jasmine oil facilitates labour and cut down the labor pains. This property can be very useful in today's situations when a normal delivery is a rare sight and most of the cases are handled with Caesarian sections. Many after labour women found that using night jasmine is very useful to reduce labour pain and making their post-natal period shorter. In addition, it can reinforce contractions and reduce the time it takes to give birth to a baby. Night jasmine essential oil combats post partum depression due to its beneficial antidepressant and relieving action.^[16]

A combination of jasmine essential oil's properties make it a perfect way to provoke long, peaceful and restful sleep.^[17] Its property to reduce cough, provide calming effect, and relieve spasm of body muscles combine to create the ideal and perfect situation to fell into a deep sleep for the entire night. This is a very useful way to alleviate insomnia and sleeplessness.

Women who suffer from irregular, blocked, or traumatic menses can be relieved by taking the night jasmine oil. The emmenagogue property of Jasmine Oil able to restore the disturbed period cycles, makes the menses clear and less painful. In short saying, it is also helping to regulate menopause. It also resolves problem originating from irregular menstruation for example tiredness, bad temper, dizziness, and mood swings.

A great way to balance the level of hormone in the body is to make the periods to be regular, in the same way to keep other body functions normally. Night jasmine oil induces the secretion of hormone oxytocin and increases milk secretion from the breasts.^{[16] [17]} Lactating mothers can provide milk to their new babies. This property is called Galactogogue. It keeps thousands of lactating mothers from breast tumors and breast cancer.



Figure1: Parts of nyctanthes arbortristis

Table1: Phyto-chemical constituents. [80][3][5][10][11][12][13]

Activity	Leaf	Flower	Fruit/seed	Stem/bark/root	Whole plant
Anti allergic	Alcoholic [18]				
Anti anxiety	Extract [48]	Ethanolic [54]			Hydro alcoholic [19]
Anti inflammatory & analgesic	Alcoholic [20], [73] Ethanolic [68] Extract [69]		Alcoholic [20], [73]	s.alcoholic [20],[73] s. methanolic [52] extract [55]	Aqueous extract [20],[73]
Anti aggressive	Ethanolic [21] Hydro alcoholic [4]	Ethanolic [21]	Ethanolic [21]	Ethanolic [21]	
Anti filarial		Chloroform [22]			
Anti bacterial	Methanolic [23] Methanolic [65] Chcl & eth.acetate [70] Ethanol & Chcl [78] ethanolic and aqueous extracts [79] ethyl acetate& Chcl [20]		Methanolic [70] Chcl & eth.acetate [20]	B.Chcl & eth.acet [63] B. various extract [51] Ethanol & Chcl [78]	Hot water, Ethanolic, Benzene, Petroleum Ether & Chloroform Extract [77]
Antioxidant	Methanolic [24] Methanolic [71]	Different solvent [47]	Methanolic[24]	s. Methanolic[24]	

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	polyphenol extract [58]	Different solvent [49] N butanol [53] Hydro alcoholic [62]			
Anti cancer	Different solvent [25]	Pet.ether, chcl, ethyl acetate [46]	Methanolic[46]		
Anti diabetic	Hydroalcoholic Chcl [75]	Hydroalcoholic Chcl [75]		r. methanolic [26],[74]	
Anti malarial	Ethanollic [21] Paste				
Anti parasitic	50% ethanolic [29],[30]				
Anti trypanosomal	50% ethanolic [31] ethanol extract [79]				
Anti viral	Ethanollic[32],[33]				
Anti histaminic Antitryptaminergic	Alcoholic[35],[33]				
Anti cholinesterase Antileishmanial					
Anti nociceptive Antipyretic	Ethanollic [36]				
Anti anemic	Ethanollic [44] Ethanollic [64]	Ethanollic [44] Ethanollic [64]	Ethanollic [44] Ethanollic [64]	Ethanollic [64]	
CNS depressant	Ethanollic [37] Ethanollic [61]	Ethanollic [37] Ethanollic [61]	Ethanollic [37] Ethanollic [61]	Ethanollic [45]	
Hepato protective	Aqueous [41] Aqueous &Ethanollic [60],[65],[76]			s. aqueous [41]	
Sedative			Aqueous [42]		
Piles, gout, dry cough	Aqueous [43]	Different solvent [47]	Aqueous [43]		
Toxicity	Ethanollic [36]				
Constipation & intestinal worms		Different solvent [47]			
Anti proloferative		Different solvent[50],[72]			
Diuretic	Ethanollic [55]	Ethanollic [55]	Ethanollic [55]	Ethanollic [55]	
Anti plasmodial potency	Ethanollic [58]				

Branco dilatory effect	Ethanolic [59]		B. pet.ether, chloroform, ethylacetate, aqueous & ethanolic [71]		
Immuno protective					Ethanolic [47]

Table 2: Pharmacological Activity

Activity	Leaf	Flower	Fruit/seed	Stem/bark/root	Whole plant
Anti allergic	Alcoholic [18]				
Anti anxiety	Extract [48]	Ethanolic [54]			Hydro alcoholic [19]
Anti inflammatory & analgesic	Alcoholic [20], [73] Ethanolic [68] Extract [69]		Alcoholic [20], [73]	s.alcoholic [20],[73] s. methanolic [52] extract [55]	Aqueous extract [20],[73]
Anti aggressive	Ethanolic [21] Hydro alcoholic [4]	Ethanolic [21]	Ethanolic [21]	Ethanolic [21]	
Anti filanial		Chloroform [22]			
Anti bacterial	Methanolic [23] Methanolic [65] Chcl & eth.acetate [70] Ethanol & Chcl [78] ethanolic and aqueous extracts [79] ethyl acetate& Chcl [20]		Methanolic [70] Chcl & eth.acetate [20]	B.Chcl & eth.acet [63] B. various extract [51] Ethanol & Chcl [78]	Hot water, Ethanolic, Benzene, Petroleum Ether &Chlorof orm Extract [77]
Antioxidant	Methanolic [24] Methanolic [71] polyphenol extract [58]	Different solvent [47] Different solvent [49] N butanol [53] Hydro alcoholic [62]	Methanolic[24]	s. Methanolic[24]	
Anti cancer	Different solvent [25]	Pet.ether, chcl, ethyl acetate [46]	Methanolic[46]		
Anti diabetic	Hydroalcoholic Chcl [75]	Hydroalcoholic Chcl [75]		r. methanolic [26],[74]	
Anti malarial	Ethanolic [21] Paste				

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Anti parasitic	50% ethanolic [29],[30]				
Anti trypanosomal	50% ethanolic [31] ethanol extract [79]				
Anti viral	Ethanolic[32],[33]				
Anti histaminic Antitryptaminergic	Alcoholic[35],[33]				
Anti cholinesterase Antileishmanial					
Anti nociceptive Antipyretic	Ethanolic [36]				
Anti anemic	Ethanolic [44] Ethanolic [64]	Ethanolic [44] Ethanolic [64]	Ethanolic [44] Ethanolic [64]	Ethanolic [64]	
CNS depressant	Ethanolic [37] Ethanolic [61]	Ethanolic [37] Ethanolic [61]	Ethanolic [37] Ethanolic [61]	Ethanolic [45]	
Hepato protective	Aqueous [41] Aqueous &Ethanolic [60],[65],[76]			s. aqueous [41]	
Sedative			Aqueous [42]		
Piles, gout, dry cough	Aqueous [43]	Different solvent [47]	Aqueous [43]		
Toxicity	Ethanolic [36]				
Constipation & intestinal worms		Different solvent [47]			
Anti proloferative		Different solvent[50],[72]			
Diuretic	Ethanolic [55]	Ethanolic [55]	Ethanolic [55]	Ethanolic [55]	
Anti plasmodial potency	Ethanolic [58]				
Branco dilatary effect	Ethanolic [59]		B. pet.ether, chloroform, ethylacetate, aqueous & ethanolic [71]		
Immuno protective					Ethanolic [47]

CONCLUSION:

Various parts of nycanthus arbortristis linn was used in traditional medicine by practioners for many ailments. The plant of sarrow has lot of medicinal uses, produced by its phytochemicals such as alkaloids, glycosides, steroids, flavonoids and terpenes. Many pharmacological activity of this plant has been proved by research work done for anti-allergic, anti-anxiety, anti-inflammatory, analgesic, anti-filial, anti-bacterial, antioxidant, anti-cancer, antidiabetic, anti-

malarial, anti-parasitic, anti trypanosomal, anti-viral, anti-histaminic, antitryptaminergic, antileishmanial, anticholinesterase, antinociceptive, antipyretic, anti-anemic, CNS depressant, diuretic, anti-plasmodial brancodilator, immune protective, hepatoprotective, sedative and used for piles, gout, drycough, constipation and toxicity treatment. Seed germination is a bit difficult process. Normal asean climatic condition is suitable for the growth of this plant.

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