EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 4
401-405
Year: 2019

REVIEW ARTICLE ON *NYCTANTHES – ARBORTRISTIS LINN* (HARSHINGHAR)

Dr. Poonam Bijalwan*[1], and Dr Prabhakar Shukla[1], Dr. Suresh Chubey[2] and Dr. Richa Sharma[3]

[1]P.G. Scholar Department of Dravyaguna, Rishikul Campus U.A.U Haridwar, Uttrakhand.
[2]Prof. Department of Dravyaguna, Rishikul Campus U.A.U Haridwar, Uttrakhand.
[3]Ass. Prof, Department of Agad Tantra, Main Campus, U.A.U Dehradun, Uttrakhand.

***Corresponding Author: Dr. Poonam Bijalwan**
P.G. Scholar Department of Dravyaguna, Rishikul Campus U.A.U Haridwar, Uttrakhand.

Article Received on 18/02/2019 **Article Revised on 11/03/2019** **Article Accepted on 01/04/2019**

ABSTRACT
Ayurveda is one of the oldest system of medicine in all over the world. Nyctanthes arbortristis Linn (oleaceae) is a well-known plant in Ayurveda. In ancient mythology this plant came from during samudra manthan along with ratna. It is an important large shrub of tropical and subtropical region of the world. Phytochemical like flavanol, glycoside, oleanic acid, tannic acid, carotene, friedeline, lupenol, glucose, benzoic acid, have been reported for hepatoprotective, leaves extract used in sciatica, anti-inflammatory, antioxidant, antipyretic, antihistaminic, antirheumatic activity. Each part of plant has some medicinal value. The need of research is how we can maintain the authentic usage of the drug and understand how the raspanchak property of the drug work in many diseases.

KEYWORDS: Nyctanthes arbortistis, phytochemical, therapeutic useage.

INTRODUCTION

Nyctanthes arbor tristis Linn (oleaceae) is popularly known as Night jasmine and tree of sorrow in (English) or *Harsinghar* in (hindi). The genric name Nyctanthes has been coined from two greek words Nyktha (night) and anthos (flower) due to the that its flower emit a pleasant fragrance during the whole night that's why is called night jasmine and Harshinghar. The specific name arbortristis meaning the sad tree because its look dull during day time[1,2,34]

Taxonomical Classification

Kingdom - Plantae
Division - Magnoliophyta
Class - Magnoliopsida
Order - Lamiales
Family - Oleaceae
Genus - Nyctanthes
Species - Arbor – tristis
Binomial name – Nyctanthes arbor –tristis[5]

Vernacular names

Sanskrit name – Paarijaat, Shephaali, Shephallika, mandaara
Hindi name - Harshingar
Malyalam - Paarijaatkoye
Marathi - Parijathak
Kannada - Parijatha
English name - Tree of sorrow, Night Jasmine, Coral Jasmine

Distribution of plant

It is found in all over india around 3000 feet height. It is native to india is found on rocky ground in dry hillsides, distributed widely in Himalayan and sub Himalayan region Bangladesh, Indo pak, south east asia. The flower is the official flower of the state of west Bengal, Siuli is local name in west Bengal.[5,6]

Morphology of plant

Nyctanthes arbor tristis a large shrub or growing to 10 m tall **leaves** opposite 5-10 by 2.5 – 6.3cm, ovate, acute, acuminate, rough and scabrous above with short bulbous hairs, entire or toothed. **Flowers** delightfully fragrant, sessile in pendunculate bracteate fascicles of 3-5; peduncles 4 angled, slender, bract ovate or suborbicular 6-10mm long, calyx 6- 8mm long hairy outside and glabrous inside, corolla glabrous, rather more than 13mm. long**; Fruit** is a flat brown heart shaped to round capsule 2 cm diameter. **Seed** erect flattened; testa thin; albumen 0; cotyledons flat; radicle **Bark** – flaky grey bark.[7]

Use of Nyctanthes arbortristis Linn

Traditional Uses

Traditionally the flowers are offering to god during worship and chanting mantra it is very sacred plant according to Hindu mythology this plant is came from during **samudra manthan** process that's why is also called **tree of paradise** and **kalpvriksha,** tribal people of indian subcontinent used leaves extract and flowers in various ailments.

Leaves

- The fresh juice of the leaves is given with honey in chronic fever and rheumatism.
- A decotion of the leaves is given with chronic fever. A decotion of the leaves, prepared over a gentle fire, is recommended as a specific for obstinate sciatica.[5]

Shephalikadale kwatho mriduagni parisadhita
Durwaram gridhshi rogam peetmatram samudeerate.
(chakradatt datt)

- The juice of the leaves is bitter and acrid; cures ***sandhivaat*** (arthiritis) and ***gudvaat.***[5]

Shephali katutikt ushna ruksha vaatkshypaha
Syaadang sandhivaatghno gudvaatadidoshnaat (Raaj nighantu)

- Juice of leaves used in fever and bronchitis, dermatitis.[5]

Ras praajaktptrasya jwarghno tiktak smritah
Parna khandsamayukta twacha kaash vinashni
(nighantu sangrah)

- The expressed juice of the leaves act as a laxative and mild bitter tonic. it is given with a little sugar to children as remedy for intestinal (thread and round) worms.[5]

Flowers

The flowers have a bitter bad taste; stomachic, carminative astringent to the bowles; lessan inflammation; a tonic to the hair and buds are tonic (imp) the bright orange corolla tubes of the flower contain a coloring substances nyctanthin, which is identical with alpha – crocetin from saffrons are used for dying silk.[5]

Seeds

Seeds are useful in piles and skin diseases. The powdered seeds are used to cure scurfy affection of the scalp.[5]

Bark

The bark cures bronchitis a decotion of the bark, leaves, root, and flowers is given in excessive diuresis and in enlargement of spleen – the oil from the bark is used for pain in the eye. 5 grains of bark are eaten with betelnut and leaf, to promote the expectoration of thick phlegm.[5]

Table 1: Ayurvedic properties.

Ras (Taste) -	Tikt
Guna (Quality)	Laghu Ruksh
Virya (Potency)	Usana
Vipak Metabolism**)**	Katu
Dosaghnatha	Kaphvaathar
Useful parts	Flower, leaves, bark
Dose	Swars 10 – 20 ml Churna -1 – 3 gm

Table 2: shows the position of *Parijata* in different literature.[8,9,10,11]

Sl.No.	Name of verga (group)	Name of Literature
1	*Guduchayadi verga*	*Bhavaprakasha Nighantu*
2	*Jatyadi verga*	*Nighantu Aadarsha*
3	*Hartiakyadhi verga*	*Priya nighantu*
4	*Pushpa verga*	*Shaligram Nighantu*

Chemical constituent present in different parts of nightjasmine and their biological activities

Plant part	Chemical constituent	Biological activity	Reference
Leaves	D-mannitol, β-sitosterole, Flavanol glycosidesAstragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, tannic acid, ascorbic acid, methyl salicylate, carotene, friedeline, lupeol, mannitol, Glucose and fructose, iridoid glycosides, benzoic acid	Antibacterial, Anthelmintic, Anti-inflammatory, Hepatoprotective, Immunopotential, Anti-pyretic, Antioxidant, Antifungal	12 13 14 15 16 17 18 19
Flowers	Essential oil, nyctanthin, d-mannitol, tannin and glucose, carotenoid, glycosides viz β-monogentiobioside ester of α-crocetin (or crocin-3), β-monogentiobioside-β-D monoglucoside ester of α-crocetin, β-digentiobioside ester of α-crocetin	Diuretic, Ant-bilious, Antioxidant, Anti-inflammatory, Sedative, Antifilarial	20 21 22
Seeds	Arbortristoside A&B, Glycerides	Antibacterial, Antifungal,	23

	of linoleic oleic, lignoceric, stearic, palmitic and myristic acids, nyctanthic acid, 3-4 secotriterpene acid.	Immunomodulatory Antileishmanial	
Bark	Glycosides and alkaloids	Anti-microbial	24
Stem	Glycoside-naringenin-4'-0-β-glucapyranosyl-αxylopyranoside and β-sitosterol	Antipyretic, Antioxidant	25 19
Flower oil	α-pinene, p-cymene, 1- hexanol methyl heptanone, phenyl acetaldehyde, 1-deconol and anisaldehyde.	as perfume	26

Therapeutic uses of night jasmine

Anti-Inflamatory, anti-pyretic activities

Anti-inflammatory activity in leaves of Harsingar supports its use in various inflammatory conditions .The water-soluble fraction of the ethanol extract elicited significant anti-inflammatory activity against acute inflammatory oedema produced in rats by different phlogistic agents, namely carrageenin, formalin, histamine, 5-hydroxytryptamine and hyaluronidase. The extract significantly reduced acute inflammatory swelling in the knee joint of rats induced by turpentine oil The leaf and fruit extracts also showed anti-iinflammatory action in the mouse. The ethanolic extract of the orange tubular calyx of Nyctanthes arbor-tristis and the isolated carotenoid (200 mg/kg) showed significant inhibition of carrragenan-induced rat paw edema when compared to the standard drug (Diclofenac sodium) and untreated control .The water-soluble portion of an ethanol extract of the leaves when screened for analgesic, antipyretic and ulcerogenic activities exhibited significant aspirin-like antinociceptive activity but failed to produce morphine-like analgesia. In rats, the extract exhibited antipyretic effect against brewer's yeast-induced pyrexia and when administered orally for six consecutive days, it produced dose-dependent gastric ulcers.[27,28]

Antioxidant activity

In living body, free radicals are generated as part of the body's normal metabolic process. Antioxidants are radical scavengers which shield the human body against free radicals that may cause pathological conditions such as ischemia, anaemia, asthma, arthritis, inflammation, neurodegeneration, Parkinson's diseases, mongolism, ageing process and perhaps dementias. In the previous study it was mention that an antioxidant activity of NAT was carried out by DPPH assay, free radical scavenging activity, reducing power assay, total antioxidant capacity. It was resolved that the plant owned strong antioxidant activity. NAT leaf extracts are extensively used in Indian traditional medicine. The acetone-soluble fraction of its ethyl acetate extract showed impressive antioxidant activity as revealed by several in vitro experiments, e.g., DPPH, hydroxyl and superoxide radicals, as well as H_2O_2 scavenging assays. In addition to that, its preventive capacity against Fe (II)-induced lipid peroxidation of liposomes and γ-ray-induced DNA damage also confirmed this. The strong reducing power and high phenolic and flavonoids contents could be responsible for the antioxidant activity.

Hepatoprotective activity

Ethanolic leaf extract of Nyctanthes arbortristis protect against carbon tetrachloride - induced hepatotoxicity in rat. For this investigation rats were pretreated with extract (1000mg/kg body weight/day, p.o. for 7 days) prior to the administration of a single dose of CCl4 (1.0ml/kg, s.c.). The samples of blood were collected at 48 h after CCl4 administration (9 day) from the abdominal aorta under pentobarbitone anesthesized (350mg/kg i.p.). Silymarin (70mg/kg body weight/day, p.o. for 7 days) were used as a reference standard. In this study the leaf extract of Nyctanthes arbortristis and silymarin restored all serum and liver parameters which were altered by (CCl4) from the normal level, also prevent loss of body weight, both candidate are also protected against (CCl4) induced increase in liver weight and volume. The mechanism involves the blockade of bioactivation of (CCl4) through inhibition of P 450 2E1 activity and or to accelerate the detoxification of (CCl4). These effects may be mediated by the antioxidant present in the plant. 24 In another investigation, the ethanolic and aqueous extract of the leaf of Nyctanthes arbortristis (500mg/kg oral route for 10 days) reversed the rise in serum AST and total bilirubin in (CCl4) induced hepatotoxicity in animal model.[14,30]

Anti-microbial activity

The frequency of life threatening infections caused by pathogenic microorganisms has risen worldwide and is becoming an important cause of morbidity and mortality in immune compromised patients in developing countries and many infectious microorganisms are resistant to synthetic drugs. A study was conducted and it was reported that the stem bark extracts of the plant were capable to exhibit in vitro antimicrobial activity by cup plate method. The test organisms were Staphylococcus aureus, Micrococcus luteus, Bacillus subtilis, Escherichia coli, Pseudomonas aeruginosa, Candida albicans and Aspergillus niger. The zone of inhibition and Minimum Inhibitory Concentration (MIC) of the extracts were ascertained and compared with the standard drugs ciprofloxacin and fluconazole. The chloroform extract was found to have both antibacterial and antifungal

activity whereas the petroleum ether and ethanol extracts possess only antibacterial activity[24]

Immunostimulent activity

Plant extracts have been widely investigated for their possible immunomodulatory properties. Aqueous leaf extract of Nyctanthes arbortristis has been found as a potent immunomodulator as evidenced by both humoral and cell mediated responses The ethanolic (50%) seed and root extracts of N. arbor-tristis also showed immunomodulatory activity against systemic candidiasis in mice. Both iridoid glucosides isolated from the seeds, viz. arbortristosides A and C (5 mg/kg), were protective with arbortristoside C providing greater protection and better cure than arbortristoside A. The administration of arbortristoside A (5 mg/kg) in prophylactic and therapeutic regimens led to enhanced protection, while arbortristoside C showed deleterious effects in the mice. The extracts and arbortristosides A and C were strongly stimulatory by increasing both humoral and delayed type hypersensitivity responses to sheep red blood cells and macrophage migration index in Balb/c mouse. Flowers have also been shown to possess immunostimulent activity by activating the cell mediated immune system[30,31,32]

Anti-viral Activity: The ethanolic extract, n-butanol fractions and two pure compounds, arbortristoside A and arbortristoside C, isolated from the N. arbor-tristis showed .pronounced inhibitory activity against encephalomyocarditis virus (EMCV) and Semliki Forest Virus (SFV). In vivo, the ethanolic extract and the n-butanol fraction protected infected mice against EMCV and SFV by 40 and 60%, respectively.[33]

CONCLUSION

Nyctanthes arbortristis is a very sacred plant used ethenomedicinally in all over india mythologically also has connection with spirituality. Many text book in Ayurveda, nighntu are described morphology, habitat, raspanchak property dose, uses of the Nyctanthes arbor tristis, raspanchak property shows the pharmacological action of the drug . parijaat has tikt Ras due to tikta rasa, and laghu guna it pacifying the *amadosa* and excess *jathara–pitta* (gastric acids), in turn body temperature is reduced. ushna virya and laghu guna it is used in kapa vitiated diseases. Due to usna virya property is used in vaat diseases like gridhsi. Phytochemical present in the different part of plant has tremendous pharmacological activities used in various diseases. It is a rich source of biologically active compounds which would attract the attention of drug to discover exact bioactive molecules for safer and effective treatment of various diseases.

REFRENCE

1. Siddiqui I, Anis M, Jahan AA. Rapid multiplication of Nyctanthes arbor-tristis through in-vitro auxillary shoots proliferation. World Journal of Agricultural Science, 2006; 2: 188-192.
2. Rout GR, Mahato A, Senapati SK. In vitro clonal propagation of Nyctanthes arbortristis Linn.-a medicinal tree. Horticulture Science (Prague), 2007; 34: 84-89.
3. Vats M, Sharma N, Sardana S. Antimicrobial activity of stem bark extracts of Nyctanthes arbortristis Linn. (Oleaceae) International Journal of Pharmacognosy and Phytochemical Research, 2009; 1: 12-14.
4. Meshram MM, Rangari SB, Kshirsagar SB, Gajbiye S, Trivedi MR, Sahane RS. Nyctanthes arbor tristisA herbal panacea. International Journal of Pharmaceutical Sciences and Research, 2012; 3(8): 2432-2440.
5. Shandhar HK, Kaur M. An update on Nyctanthes arbortristis Linn. Journal of Internationale Pharmaceutica Sciencia, 2011; 1: 77-86.
6. Kirtikar KR, Basu BD, Singh B, Singh MP. Indian medicinal plants 1975; 1(2): 2392-93.
7. Kirtikar KR, Basu BD, Singh B, Singh MP. Indian medicinal plants volume II edition 2006
8. Acharya Sharma P.V, Priya Nighantu, 1st edition, Haritakyadi Varga, Verse 190-92, Page-42/192, Chowkhamba Surabharati Prakashana, Varanasi, 2004.
9. Bapalal G Vaidya, Nighantu Adarsha, 1st edition, Vol- I, Jatyadi Varga, Page No.-838,Chawkhamba Vidya bhavan, 1968.
10. Acharya Lala Shaligrama Vaishya, Shaligrama Nighantu, commentary by Pt. Shankar Lal Harishankar, 3rdedition, 4th reprint, Page No. -520, Shri Krishna das Prakashana Bombay, 1995.
11. Acharya Pt. NaraHari,: Raja Nighantu, Dravyaguna Prakashika Hindi commentary by Indradev Tripathi, Chapter: 8, Verse: 129, Page No:257, Chowkhamba Krishna Das Academy, Varanasi, Fourth Edn: 2006..
12. Saxena RS, Gupta B, Saxena KK, Singh RC & Prasad DN, Study of anti-inflammatory activity in the leaves of Nyctanthes arbor-tristis Linn. - An Indian medicinal plant, J Ethnopharmacol, 1984; 11: 319-330.
13. Vishwanathan M & Juvekar AR, Hepatoregenerative effect of Nyctanthes arbor-tristis Linn. on acetaminophen induced oxidative damage in rats, Int J Pharm Tech Res, 2010; 2(2): 1291-1297.
14. Hukkeri VI, Akki KS, Sureban RR, Gopalakrishna B, Byahatti VV & Rajendra SV, Hepatoprotective activity of the leaves of Nyctanthes arbor-tristis Linn., Ind J Pharm Sci, 2006; 68(4): 542-543.
15. Alamgir M & Uddin SJ, Recent advances on the ethnomedicinal plants as immunomodulatory agents Ethnomedicine. In: A Source of Complementary Therapeutics, edited by Chattopadhyay D, (Research Signpost, Kerala, India), 2010; 227-244.
16. Saxena RS, Gupta B, Saxena KK, Srivastava VK & Prasad DN, Analgesic, antipyretic and ulcerogenic activity of Nyctanthes arbortristis leaf extract, J Ethnopharmacol, 1987; 19: 193-200.

17. Rathee JS, Hassarajani SA & Chattopadhyay S, Antioxidant activity of Nyctanthes arbor-tristis leaf extract, Food Chem, 2007; 103: 1350–1357.
18. Bhowmick BN & Choudhary BK, Antifungal activity of leaf extracts of medicinal plants on Alternaria alternate (Fr.) Kessler, Ind Bot Rep, 1982; 1(2): 164-165.
19. Thangavelu NR & Thomas S, In-vitro anti-oxidant studies on ethanolic extracts of leaves and stems of Nyctanthes arbor-tristis L. (Night flowering Jasmine), Int J Biol Med Res, 2010; 1(4): 188-192.
20. Khatune NA, Haque ME & Mosaddik MA, Laboratory evaluation of Linn. Flower extract and its isolated compound against common filarial vector, Culex quinquefasciatus Say (Diptera culicidae) larvae, Pakistan J Biol Sci, 2001b ; 4(5): 585-587.
21. Ratnasooriya WD, Jayakody, JRAC, Hettiarachchi, ADI & Dharmasiri, MG, Sedative effects of hot flower infusion of Nyctanthes arbor-tristis on Rats, Pharmaceut Biol, 2005; 43(2): 140-146.
22. Omkar A, Jeeja T & Chhaya G, Evaluation of anti-inflammatory activity of Nyctanthes arbor-tristis and Onosma echioides, Pharmacog Mag, 2006; 2(8): 258-260.
23. Singh RB & Jindal VK, Polysaccharide from Nyctanthes arbor-tristis Linn. seeds isolation, purification and preliminary analysis of polysaccharide, J Ind Chem Soc, 1985; 62(8): 627-628.
24. Vats M, Sharma N & Sardana S, Antimicrobial Activity of Stem Bark Extracts of Nyctanthes arbor-tristis Linn. (Oleaceae), Int J Pharmacog Phytochem Res, 2009; 1(1): 12-14
25. Girach RD, Aminuddin SA, Siddiqui PA & Khan SA, Ethnomedicinal studies on Harsinghar (Nyctanthes arbor-tristis L.)- A less known medicinal plant in Unani medicine, Hamdard Med, 1994; 37(2): 60-66.
26. Chandra G, Chemical composition of the flower oil of Nyctanthes arbor-tristis Linn., Indian Perfumer, 1970; 14(1): 19.
27. Patel UM, Patel KM, Patel MP & Bhavasar GC, Anti-inflammatory activity of Nyctanthes arbor-tristis, Indian J Nat Prod, 1999; 15: 18-20. 62
28. Saxena RS, Gupta B, Saxena KK, Srivastava VK & Prasad DN, Analgesic, antipyretic and ulcerogenic activity of Nyctanthes arbortristis leaf extract, J Ethnopharmacol, 1987; 19: 193-200.
29. Rathee JS, Hassarjani SA and Chattopadhyay S. Antioxidant activity of Nyctanthes arbortristis leaf extract. Food Chemistry, 2007; 103: 1350-1357.
30. Vishwanathan M & Juvekar AR, Hepatoregenerative effect of Nyctanthes arbor-tristis Linn. on acetaminophen induced oxidative damage in rats, Int J Pharm Tech Res., 2010; 2(2): 1291-1297.
31. Puri A, Saxena R, Saxena RP, Saxena KC, Tandon JS & Srivastava V, Immunostimulant activity of Nyctanthes arbor-tristis L., J Ethnopharmacology, 1994; 42: 31-37.
32. Alamgir M & Uddin SJ, Recent advances on the ethnomedicinal plants as immunomodulatory agents Ethnomedicine. In: A Source of Complementary Therapeutics, edited by Chattopadhyay D, (Research Signpost, Kerala, India), 2010; 227-244.
33. Khan ZK, Manglani A, Shukla PK, Puri A, Saxena RP & Tandon JS, Immunomodulatory effect of plant extracts and iridoid glucosides from Nyctanthes arbor-tristis against systemic candidiasis in mice, Int J Pharmacog, 1995; 33(4): 297-304.
34. Gupta P, Bajpai SK, Chandra K, Singh KL & Tandon JS, Antiviral profile of Nyctanthes arbor-tristis L. against encephalitis causing viruses, Indian J Exp Biol., 2005; 43(12): 1156-60.