IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, November 2022
Impact Factor: 6.252

Monograph Studies on Nyctanthes arbor-tristis

Jadhav Sayali S[1], Desale Mrugasha G[2], Dhokale Mansvi A[3], Chaudhari Vaishnavi S[4], Dhokale Prathamesh D[5], Bhalekar S. M[6]
Students, Samarth Institute of Pharmacy, Belhe, Maharashtra, India[1,2,3,4,5,6]

Abstract: *Nyctanthes arbor-tristis belongs to Oleaceae family, which has various medicinal properties.Different parts of the plant are utilized in traditional treatment to cure various diseases like sciatica, chronic fever, skin related diseases. In the current research, the methanol and aqueous extracts of Nyctanthes arbor-tristis leaves were evaluated for phytochemical analysis, antioxidant, antibacterial and anti-inflammatory activities. The preliminary phytochemical analysis in the methanolic and aqueous extracts showed the presence of compounds such as alkaloids, glycosides, phenols, flavonoids, terpenoids, and tannins. Themethanolic extract showed maximum anti-inflammatory activity than the aqueous extract. The antibacteria activity assessed using the methanolic extract of N. arbor-tristis flower extract showed significant zone of inhibition.*

Keywords: Nyctanthes arbor-tristis, phytochemicals, antioxidant, antibacterial, anti-inflammatory activity

I. INTRODUCTION

Nyctanthes arbor-tristis Linn.(Oleaceae) is popularly known as ' Night Jasmine' (English) or ' Harsinghar' (Hindi) due to the fact that its flowers emit a very strong and pleasant fragrance during the whole night [1,2] The medicinal herbs provide essential novel bioactive molecules. Major drugs used in the field of medicine are obtained from various plants. The drugs used from the plants extract are non- toxic comparing with the chemical used in Pharmaceutical industry. The plants are reservoir of potential phytochemicals which serve as drug [3]. The specific name ‘arbor-tristis’ meaning ‘the sad tree’ is supposedly derived from the tree during daytime [4].

The leaves of N. arbor-tristis has many pharmacological properties, extensive work have been done on N. arbor-tristis for exploring their pharmacological properties. Traditionally the stem bark is applied in a form of paste for rheumatic joint pains.[5] The major medicinal value is due to presence of phytochemical like nyctantic acid, friedelin, beta-sitosterol and oleanolic acid which are present in leaves and responsible for antiviral activity. The present study is aimed to study the pharmacological properties of N. arbor-tristis flower extract.[6]

Nyctanthus is commonly known as:

a. Night flowering jasmine
b. Coral jasmine
c. Parijat in Hindi
d. Paariijaatham in Telgu
e. Shephali in Oriya.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, November 2022
Impact Factor: 6.252

1.1 Scientific Classification

Kingdom	Plantae
Subkingdom	Viridiplantae
Subdivision	Spermatophytina
Class	Magnoliopsida
Subclass	Asterdae
Family	Oleaceae
Genus	Nyctanthes
Species	Nyctanthes arbor-tristis

II. MATERIAL AND METHOD

2.1 Plant Collection

The fresh leaves of N. arbor-tristis were collected from Nighoj Ahmadnagar district Maharashtra during the months of July and August. The flowers were washed thoroughly and allowed to dry. The flowers after drying were powdered using electrical blender.

2.2 Extraction of Plant Material

Cold percolation technique was employed wherein the powdered sample was soaked in methanol and aqueous for about 48hours. The extract was then filtered using Whatmann's filter paper. The extract after filtration was concentrated using rotary evaporator. The obtained extract was stored in air tight bottles for further experiments.

2.3 Qualitative Phytochemical Analysis

The methanol and aqueous extracts were tested for the presence of secondary metabolites. Standard procedures were used for identifying the phytoconstituents.

Chemical test	Result
Alkaloids	Positive
Carbohydrates	Positive
Glycosides	Positive
Phenolic compounds	Positive
Flavonoids	Negative
Terpenoids	Positive
Saponins	Positive
Protein and Amino acid	Positive

2.4 Loss on Drying

The powdered drug sample (10 g) was taken without preliminary drying and was placed on a tarred evaporating dish and dried at 105°C for six hours and weighed. The drying was continued until two successive reading matches each other or the difference between two successive weighing after drying for 30 minutes in a desiccator, showed not more than 0.01 g difference [7]

2.5 Determination of pH

pH 1% solution:

An accurately weighed 1.0 g of powdered drug was dissolved in 100 ml of distilled water. It is then filtered and the pH of the filtrate was recorded with a standardized glass electrode [28].

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, November 2022
Impact Factor: 6.252

2.6 Pharmacological Activities

Biological activity of NA has been reported from the crude extracts and their different fractions from leaf, bark, root, seed, oil [8,9,10] . Crude extracts of different parts of NA have been used as traditional medicine for the treatment of various diseases. Use of different parts of NA in Ayurveda, Siddha and Unani systems of medicines has been prescribed from time immemorial [11,12,13]

B. Anti-Oxidants Activity

Nyctanthus arbor-tristis revealed the presence of flavonoids, tannins, saponins, glycosides, alkaloids, steroids and phenolic compounds. Phenolic compounds have been recognized as antioxidant agents, which act as free radical terminators [14,15]. Phytochemical screenings of the ethanolic extract of the leaves and stems of aqueous and alcoholic extracts of dried leaves of NA also have adequate antioxidant activity. The encouraging results of NA with the various in vitro antioxidant tests proved the plant as a reducing agent and effective as scavenger of hydrogen peroxide and free radicals. The overall antioxidant activity of NA might be attributed to its polyphenolic content and other phytochemical constituents [16].

A. Anti - Inflammatory Activity

The in vitro anti-inflammatory assay of methanol and aqueous extract of N. arbor-tristis flower was carried out using egg albumin denaturation assay the results revealed that the activity was in a dose dependent manner . The activity was determined based on the IC50 value. The IC50 value is the measure of extract required for 50% inhibition. When the IC50 value is lesser it denotes higher anti-inflammatory activity. The methanolic extract showed maximum anti-inflammatory activity than the aqueous extract. Inflammation is one of the focused area in the era of scientific research, as the synthetic anti-inflammatory drugs pose several adverse reactions. The results of anti-inflammatory provide a clear evidence for the use of N. arbor-tristis as a natural remedy for inflammation [17].

C. Hepatoprotective Activity

Alcoholic and aqueous extract of the leaves of N. arbortristis have been reported to demonstrate significant hepatoprotective activity in carbon tetrachloride and acetaminophen induced liver damage in rat models [18].

D. Antimicrobial and Antifungal Activity

Phenolic compounds and tannins in ethanolic extract of leaves are found to be active against Staphylococcus aureus and Salmonella paratyphi. Antimicrobial evaluation of aqueous and alcoholic extract of leaves against numerous Gram positive and Gram negative strains revealed that Salmonella typhimurium, Pseudomonas aeruginosa, Klebsiella pneumonia, E. coli, P. marginata and Staphylococcus epidermis were found more susceptible to the aqueous extract where as Micrococcus luteus, Staphylococcus aureus, Sterptococcus pyogenes and Baccilus subtilis were more sensitive to methanolic extract. Chloroform and ethyl acetate extracts of fresh and dried leaf, flowers, fruits and seeds are also reported to have a dosedependent antibacterial activity against Gram negative bacteria. The activity has been found significant for fresh plant materials than the dried plant parts. The stem bark extracts (petroleum ether, chloroform and ethanol) are found to have potential antimicrobial activity against S. aureus, Micrococcus luteus, B. subtilis, E. coli, P. aeruginosa, Candida albicans and Aspergillus niger [19,20].

E. Antiviral Activitiy

The ethanolic extract, n-butanol fractions and two pure compounds, arbortristoside C, isolated from the NA possess pronounced inhibitory activity against encephalomyocarditis virus (EMCV) and Semliki forest virus (SFV). The in-vivo ethanolic extract and the n-butanol fraction at daily doses of 125mg/kg weight protected EMCV infected mice against SFV by 40 and 60% respectively

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, November 2022
Impact Factor: 6.252

F. CNS Depressant Activity

The leaves, flowers, seeds, and barks of NAT (600 mg/kg) were found to significantly and dose-dependently prolong sleep onset and duration and to cause a decrease in dopamine and an increase in serotonin levels, implying that the CNS depressant activity of the ethanol extracts of seeds, leaves, and flowers is due to a decrease in dopamine.

III. RESULT AND DISCUSSION

In the present study plants were collected and were authenticated. Then they were shade dried and powdered and were subjected to phytochemical screening. The dried powdered leaves of Nyctanthes arbortistiswere subjected to soxhlet extraction with petroleum ether. The qualitative chemical tests for the extracts were performed. The investigation showed that Nyctanthes arbortristis contains phenolic compounds, tannins, glycosides, carbohydrates, Cardiac glycosides, proteins and alkaloids were present in Nyctanthes arbortristis. Anthraquinone glycosides and flavonoids were absent.

IV. CONCLUSION

We can conclude that the selected leaf extracts were showing many secondary metabolites are present. Phytochemical analysis of Nyctanthes arbortristis leaves extracts was done by using the extracts which were obtained by cold extraction method and soxhlet method. The screening of phytochemical constituents of plants Nyctanthes arbortristis indicated the presence of carbohydrates, proteins and alkaloids in common. The plant contains more metabolites and there is a need for further investigations using fractionated extracts and purified chemical components.

REFERENCES

[1]. Siddiqui, Anis M , Jahan AA. Rapid multiplication of Nyctanthes arbor-tristis through in- vitro auxiliary shoots proliferation.world Journal of Agricultural Science 2006 ; 2 : 188-192.
[2]. Rout GR, Mahato A, Senapati SK. In vitro clonal propagation of Nyctanthes arbor-tristis Linn-a medicinal tree. Horticulture Science (Prague) 2007 ; 34 : 84-89.
[3]. Kiew, R; and Bass, P. (1984). Nyctanthes is a member of oleaceae. Proc. Indian Acd. Sc. (Plant Sc). 1984; 93(3) : 349-358.
[4]. Suresh V, Jaikumar S, Arunachalam G (2010) antidiabetic activity of ethanolic extract of stem bark of Nyctanthes arbor-tristis Linn. Research journal of pharmaceutical, biological and chemical science 1(4) : 311-317.
[5]. Kirtikar, K. R. and Basi, B.D. (2000) Indian Medicinal Plants, vol.VII cari satguru publication, New Delhi , 2110-2113.
[6]. Sharma R. (2003). Medicinal plants of India - an Encyclopaedia, Delhi, Daya publishing house, 71.
[7]. Gupta AK (2003) Quality standards of Indian medicinal plants. Indian council of medicinal research, New Delhi 1: 57-81.
[8]. Savio M , Raviprakash V, Suresh S and Jawahar L (1974) Pharmacological action of Nyctanthes arbor-tristis, proc 6th annual conf, Ind Pharm SOC Indian pharmacol 6 : 17.
[9]. Surange SR, Pendse GS (1971) Pharmacognostic study of leaf of Nyctanthes arbor-tristis Linn (Parijata) ,IRes Ind Med 6(4): 183-190.
[10]. Mandal S, P Jain R, Mukhopadhyay S (1998) Naturally occuring iridoids with pharmacological activity. Indian J Pharm Sci 60 (3): 123-127.
[11]. Girach RD, Aminuddin SA, Siddiqui PA, Khan SA (1994) Ethanomedicinal studies on Harsinghar less known medicinal plant in Unani medicine hamdard Med 37(2): 60-66.
[12]. Plant R (1984) Nyctanthes arbor-tristis Sachitra Ayurveda 35 (9): 613-615.
[13]. Goyal DK, Tiwari SK, Agarwal R (1997) effect of Parijata leaves on Sciatica sachitraayurveda 51: 667-668.
[14]. Shahidi F, Wanasundra PKJPD (1992) phenolic antioxidants. Crit Rev food Sci Nutr 32(1): 67-103.
[15]. Devasagayam TPA, Dainis KB (2002) Immune system and antioxidants, especially those derived from Indian Medicinal Plants. Indian J exp boll 40(6): 639- 655.
[16]. Rather JS, Hassarajani SA,bChattopadhyay S (2007) antioxidant activity of Nyctanthes arbor-tristis leaf extract food chem 103(4): 1350-1357.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, November 2022
Impact Factor: 6.252

[17]. Valli A.S and GowriebV (2017). A study on the bioactive potential of fresh and dried sprouts of Cocos nucifera L- an in vitro and in silico approach. Int J Pharma Sci 9(3): 129-142.

[18]. Singha LS, Bawari M , Choudhary MD. Hepatoprotective and antipyretic effect of bark of Nyctanthes arbor-tristis Linn. International Journal of pharmacy and pharmaceutical science 2014; 6(2): 110-114.

[19]. Aggarwal SG, Goyal S. Nyctanthes arbor-tristis Against Pathogenic Bacteria. Journal of Pharmacognosy and Phytochemistry 2013; 2 (3): 124-127.

[20]. Hirapure P, Pote M. Antimicrobial activity of Nyctanthes arbortristis Linn on few clinical isolates. International Journal of Pharmaceutical Research and Bioscience 2014; 3(2): 80-85.