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TO INVESTIGATE THE ANTI-OXIDANT AND FREE RADICAL SCAVENGING ACTIVITY OF *Nyctanthes Arbor-Tristis Linn* LEAVES.

[1]Dr.S.Chandra,M.pharm,Ph.D,D.lit., [2]Mrs. V. Saraladevi, M.Pharm.,Ph.D., [3]M.Manikandan, [4]K.Nithya,[5]K.Sharan,[6]M.Vinith.

[1]Principal,[2]Associate professor,[3, 4,5,6]Students

Department of Pharmacognosy,

Sri Lakshminarayan College of Pharmacy Dharmapuri,Tamil Nadu.

ABSTRACT

This study explores the medicinal properties of *Nyctanthes arbor-tristis linn* commonly known as Night Jasmine, is a widely used medicinal plant with significant pharmacological properties. This study aims to evaluate the antioxidant properties of its leaves using the DPPH (1,1-Diphenyl-2-Picryl Hydrazyl) radical scavenging assay. The chloroform extract of *Nyctanthes arbor-tristis* leaves was prepared through maceration extraction and subjected to various pharmacognostical, physiochemical, and phytochemical evaluations. The results confirmed the presence of bioactive compounds such as alkaloids, flavonoids, tannins, saponins, and phenolic compounds, which contribute to its antioxidant activity. Different concentrations (5, 10, 20, 40, 80, 160 and 320 µg/ml) of test sample and reference standard (ascorbic acid) were mixed with 2.5 ml of DPPH solution. The IC50 value for the extract was found to be 73.04 µg/ml compared to 19.88 µg/ml for ascorbic acid, indicating its potential as a natural antioxidant. Additionally, the plant exhibited various pharmacological activities, including anti-inflammatory, hepatoprotective, antimalarial, CNS depressant, and anti-allergic effects. The findings highlight the therapeutic significance of *Nyctanthes arbor-tristis linn* and its potential application in herbal medicine.

Keywords: *Nyctanthes arbor-tristis linn* leaves, Ethanol extraction, Antioxidant, DPPH assay.

INTRODUCTION

India, with its rich biodiversity, is home to over 7,000 medicinal plant species used in traditional systems like Ayurveda, Unani, and Siddha. Medicinal plants play a crucial role in healthcare, especially in rural areas where they provide affordable treatment options.

Nyctanthes arbor-tristis linn (Night Jasmine) is a medicinal shrub found in India and other parts of Asia and Africa. It is widely used in Ayurveda for its health-promoting and disease-preventing properties. The plant contains bioactive compounds such as alkaloids, flavonoids, tannins, and phenolic acids, which contribute to its antimicrobial, anti-inflammatory, hepatoprotective, and antioxidant effects.

Oxidative stress, caused by free radicals, is linked to aging, inflammation, and various diseases. Given its rich antioxidant profile, this study evaluates the antioxidant potential of *Nyctanthes arbor-tristis linn* using the DPPH radical scavenging assay to assess its ability to neutralize free radicals.

Nyctanthes arbor-tristis linn is likewise known as night flowering jasmine, parijat, and shiuli. It belongs to the own circle of relatives of Oleaceae. This plant is observed in South Asia and Southeast Asia. This is a small tree that grows 10-30 ft lengthy. Their leaves are easy and contrary 6-12cm lengthy and 2-6. five cm extensive with the whole margin. This tree is on occasion known as the Tree of Sorrow because this plant's plant life loses its brightness at night. This plant has additionally cited its function and importance in our Veda. The leaves of this plant are utilized in ayurvedic remedies and homeopathy and domestic treatments to remedy ache and fever, and different infections. The leaves of this plant have numerous lively compounds

like D-mannitol, β-Sitosterol, Flavanol Glycosides, Nicotiflorin, Oleanolic acid, Tannic acid, Ascorbic acid, Methyl salicylate, glycosides, carotene, glucose, and benzoic acid.

Plant of Nyctanthes arbor-tristis

MATERIALS AND METHODS

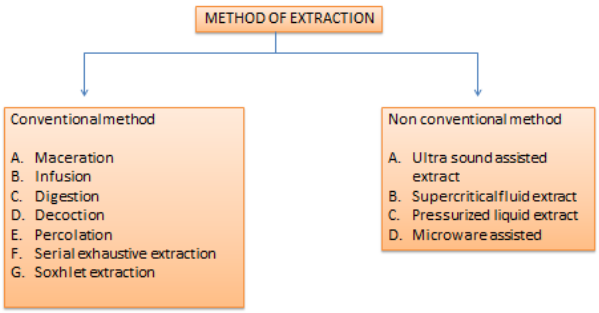
COLLECTION OF SAMPLES OF NYCTANTHES ARBORTRISTIS LEAVES

The sample *Nyctanthes arbor-tristis linn* leaves was collected by the near sandhapettai Street area santhur krishnagiri district.

EXTRACTION

It is a Isolation process which involves the separation of medicinally active portions of plant from the Extraction inactive or inert components by using selective solvents in standard extraction procedures. In this method the wanted components are dissolved by the use of selective solvents known as menstrum & undissolved part is a mare. After the extraction unwanted matter is removed. Extracts are prepared by using suitable solvent.

METHOD OF EXTRACTION



In this study, maceration extraction is used for ethanol extract of leaves of *Nyctanthes arbor-tristis linn.*

Maceration extraction

In this process, the whole or coarsely powdered crude drug is placed in a stoppered container with the solvent and allowed to stand at room temperature for a period of at least 7 days with frequent agitation until the soluble matter has dissolved. The mixture then is strained, the marc (the damp solid material) is pressed, and the combined liquids are clarified by filtration or decantation after standing.

Procedure

25gm of air dried tuber powder of Nyctanthes leaves was macerated with 50ml of ethanol in a closed flask, shaking frequently during the first 7 days and allowed to stand separately. Thereafter, it was filtered rapidly taking precaution against loss of material evaporated 25ml of filtrated to dryness in a tarred flat bottom shallow dish dried at 105℃ and weighted Percentage of alcohol soluble extractive was calculated with refer air dried drug.

Maceration extraction

RESULT AND DISCUSSION

PHARMACOGNOSTICAL EVALUATION STUDIES

The pharmacognostical study is the major and reliable criteria for identification of plant drugs. The pharmacognostical parameters are necessary for confirmation of the identity and determination of quality and purity of the crude drug. The detailed and systematic pharmacognostical evaluation would give valuable information for future studies.

Macroscopic Evaluation

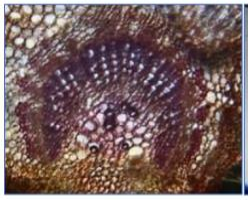
The macroscopic characteristics of leaves were observed (appearance, fracture, colour, odour, scale, shape, texture, taste). The technique described by Trease and Evans was used to perform quantitative microscopy.

- **Part** : Leaves
- **Colour** : Light to dark green
- **Odour** : Indistinct
- **Taste** : Bitter and astringent
- **Size** : 5-15 cm long, 2.5-5.7 cm wide
- **Texture** : Rough
- **Shape** : Heart
- **Base** : Oblique
- **Margin** : Entire
- **Apex** : Acute
- **Venation** : Reticulate

Microscopical evaluation

A thin transverse segment of afresh leaves was prepared and stained with concentrated hydrochloric acid: Phloroglucinol for microscopic examination (1:1). The photographs were taken with great care. The dried leaves were powdered and treated with a 5% KOH solution, then stained for 5 minutes with concentrated hydrochloric acid - Phloroglucinol (1:1) and placed in a 50% glycerine solution. “Histological studies such as category along with tissue preparation, the incidence of quantity classification such as calcium oxalate crystals using a magnification microscope were involved.

a) T.S. leaves of NAT mid-rib

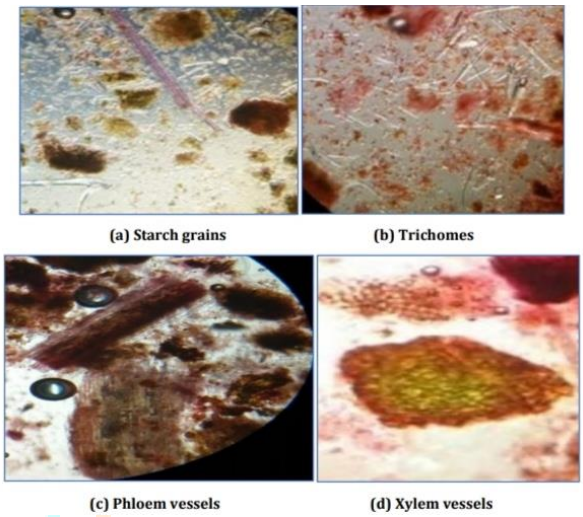


(b) Vascular bundle

(c) Trichome

Powder microscopy:

Nyctanthes arbor-tristis linn "powder microscopy" reveals the occurrence of starch grains, palisade cells, trichomes, phloem and xylem vessels. This includes the histological study of the tissue preparation type, the occurrence of quality characteristics "such as trichome and starch grain using a magnification microscope", for example.



(a) Starch grains (b) Trichomes

(c) Phloem vessels (d) Xylem vessels

PHYSIOCHEMICAL EVALUATION STUDIES

The quantitative determination of some pharmacognostical parameters is useful for setting standards for crude drugs. The physical constant evaluation of the drugs is an important parameter in detecting adulteration or improper handling of drugs. The moisture content of the drug is not too high; thus, it could discourage bacterial, fungi or yeast growth. Equally important in the evaluation of crude drugs, is the ash value and acid-inoluble ash value determination. The total ash is particularly important in the evaluation of purity of drugs, Le, the presence or absence of foreign inorganic matter such as metallic salts and/or silica. The results of physicochemical parameter analysis of crude powder are *Nyctanthes arbor- tristis linn* shown in.

Physiochemical Analysis of *Nyctanthes arbor- tristis linn.*

S.NO	Parameter	Results (% W/W)
1.	Loss on drying	11.21%
2.	Total ash	28.57%
3.	Acid- insoluble ash value	16.06%
4.	Water-Soluble Ash Value	48.51%
5.	Sulphated Ash value	84.61%

Preliminary phytochemical studies of *Nyctanthes arbor- tristis linn*.

Preliminary phytochemical screening showed the presence of alkaloids, flavonoids, carbohydrates, proteins, tannins, Steroids and Saponin Glycoside.

S.NO	Secondary Metabolites	Results (Presence/Absence)
1)	**Carbohydrates**	+
2)	**Flavonoids**	+
3)	**Alkaloid**	+
4)	**Phenol**	+
5)	**Tannins**	+
6)	**Cardiac glycosides**	+
7)	**Saponins**	+

Result : + Present

ANTIOXDANT ACTIVITY –DPPH(2,2-DIPHENYL-1-PICRYL HYDRAZYL) RADICAL SCAVENGING

Antioxidant DPPH –Assay

Control		**0.806**	**0.807**	**0.804**
Samples	**Conc.(µg/ml)**	**Singlet**	**Duplicate**	**Triplicate**
Ascorbic acid	5	0.745	0.743	0.746
	10	0.514	0.512	0.513
	20	0.389	0.388	0.386
	40	0.163	0.165	0.164
	80	0.082	0.081	0.083
	160	0.047	0.046	0.045
	320	0.026	0.029	0.028
NATL	**Conc.(µg/ml)**	**Singlet**	**Duplicate**	**Triplicate**
	5	0.779	0.774	0.779
	10	0.752	0.753	0.754
	20	0.738	0.737	0.736
	40	0.645	0.644	0.643
	80	0.458	0.456	0.457

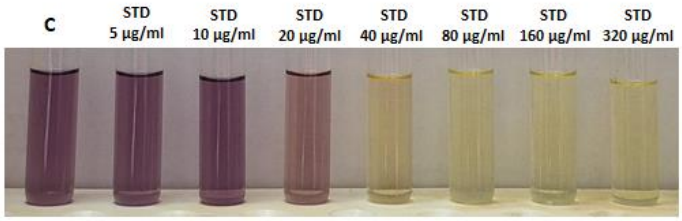
	160	0.143	0.145	0.142
	320	0.087	0.083	0.085

Singlet	Duplicate	Triplicate	Mean	SD	IC50 (µg/ml)
7.5682382	7.9306072	7.213930	7.57092525	0.358346	
36.228288	36.555143	36.19403	36.32582007	0.1993364	
51.736973	51.920694	51.99005	51.88257213	0.1307744	
79.776675	79.553903	79.60199	79.64418944	0.1172279	**19.88**
89.826303	89.962825	89.67662	89.82191497	0.1431546	
94.168734	94.299876	94.40299	94.29053188	0.1174045	
96.774194	96.406444	96.51741	96.5660167	0.1886312	

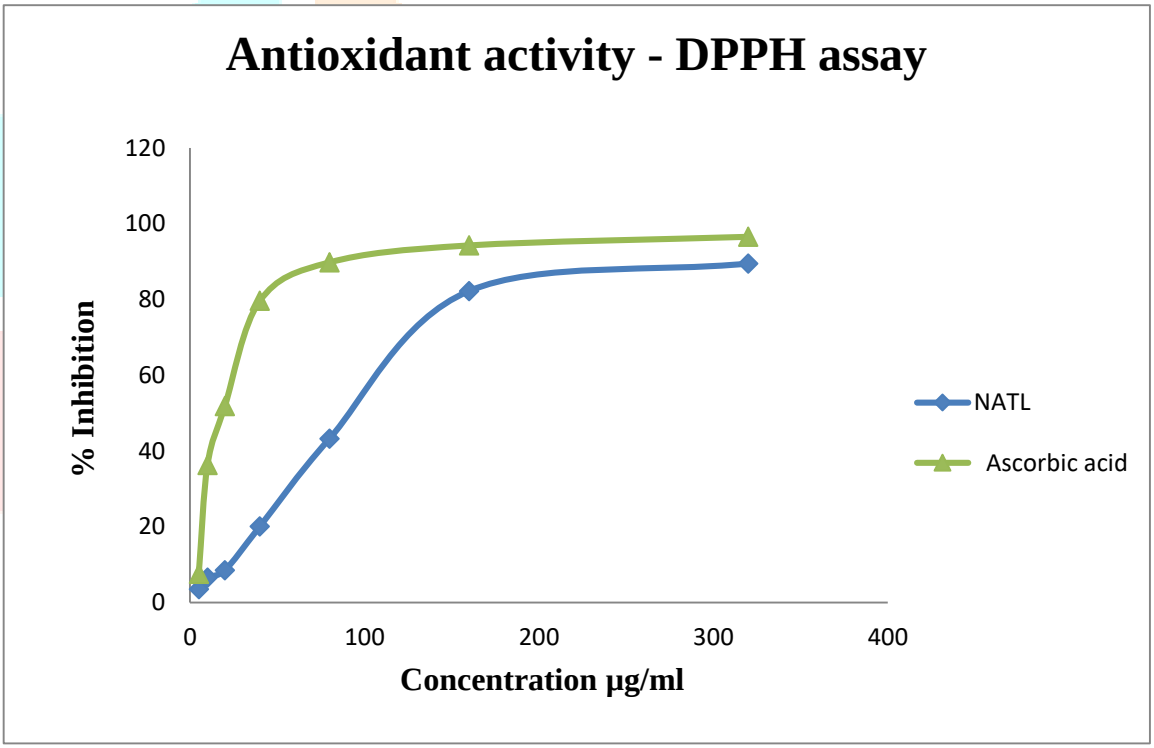
Singlet			**Duplicate**	**Triplicate**	**Mean**	**SD**
3.3498759	4.0892193	3.1094527	3.516182666	0.5106164		
6.6997519	6.6914498	6.2189055	6.536702383	0.2752515		
8.4367246	8.6741016	8.4577114	8.522845873	0.1314109		
19.975186	20.198265	20.024876	20.06610897	0.1171162	**73.04**	
43.176179	43.494424	43.159204	43.27660214	0.1888299		
82.258065	82.032218	82.338308	82.20953036	0.158712		
89.205955	89.714994	89.427861	89.44960328	0.2552148		

Conc.(µg/ml)	NATL	Ascorbic acid
5	3.516182666	7.57092525
10	6.536702383	36.3258201
20	8.522845873	51.8825721
40	20.06610897	79.6441894
80	43.27660214	89.821915
160	82.20953036	94.2905319
320	89.44960328	96.5660167

Antioxidant DPPH –Assay



Control and reference standard (Ascorbic acid)



Control and *Nyctanthes arbor-tristis linn*.

Result: The IC50 value of the given test sample (NATL) and reference standard (ascorbic acid) were found to be 73.04µg/ml and 19.88µg/ml, respectively.

CONCLUSION

The study on Nyctanthes arbor-tristis (Night Jasmine) highlights its significant medicinal potential due to its rich phytochemical composition, including alkaloids, flavonoids, tannins, and phenolic compounds. Various pharmacological activities, such as antioxidant, anti-inflammatory, hepatoprotective, antimalarial, CNS depressant, and anti-allergy properties, were observed.The antioxidant activity, evaluated using the DPPH radical scavenging assay, showed effective free radical scavenging properties, confirming its potential role in managing oxidative stress-related diseases. The phytochemical screening confirmed the presence of bioactive compounds responsible for these medicinal properties. Overall, Nyctanthes arbor-

tristis demonstrates promising therapeutic applications, supporting its traditional use in Ayurvedic medicine. Further research and clinical studies are recommended to explore its full pharmacological potential and possible applications in modern medicine.

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