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A REVIEW ON ANTI-INFLAMMATORY ACTIVITY OF ETHANOLIC LEAVES EXTRACT OF NYCTANTHAS ARBOR-TRISTIS

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Abstract:

Parijata [Nyctanthes arbor-tristis] is commonly called as the night jasmine, is one of the most useful traditional medicinal plants in India. It is distributed widely in sub-Himalayan regions and southwards to Godavari. Each part of the plant has some important medicinal value and is thus commercially exploitable. It is now considered as a valuable source of several unique products for the medicines against various diseases and also for the development of some industrial products. The nyctanthes arbor-tristis leaves have the medicinal use such as anti-inflammatory, anti-bacterial, anti-inflammatory, anti-pyretic, , anti-allergic, anti-viral, diabetes control and it is used to treat the arthritic knee pains and sciatica. The present review is to focus on the anti-inflammatory activity on potential Phyto-chemicals constituents of nyctanthes arbor-tristis leaves. [1]

Keywords: *Nyctanthes arbor-tristis, Anti-inflammatory, Phyto-chemical constituents, Tree of sorrow, Har-singhar, Iridoid glycosides.*

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INTRODUCTION:

Nyctanthes arbor-tristis also called as "tree of sorrow" because the flowers lose their brightness during day time, the scientific name arbor-tristis also means "sad tree". The flowers can be used as a source of yellow dye for clothing .It is commonly known as har-singhar, night jasmine and Parijat, it belongs to the Oleaceae family; it is a large shrub or small tree, found throughout in India as well as chitrakoot region. It is distributed in sub-Himalayan region and also found in Indian garden as ornamental plant. The plant is tolerate to moderate shade and can grow on rocky ground in dry hill shades, dry deciduous forests or at sea-level up to 1500m altitude with a wide range of rainfall patterns, from seasonal to non seasonal and is tolerant to moderate shade. Different parts of Nyctanthes arbor-tristis are known to own for treatment of various aliments by tribal people of India especially Orissa and Bihar along with its use in ayurveda, siddha and Unani systems of medicines. Leaves are opposite, ovate, acute or acuminate, teeth; short bulbous hairs rounder slight cuneate. The leaves of Nyctanthes arbor-tristis linn are used extensively in ayurvedic medicine for the treatment of various diseases such as sciatica, chronic fever, rheumatism, and internal worm infections, and as a laxative, diaphoretic, and diuretic. Leaves are used in cough. Leaf juice is mixed in honey and given thrice daily for the treatment of cough . Paste of leaves is given with honey for the treatment of fever, High blood pressure, and diabetes. Juice of the leaves is used as digestives, antidote to reptile venoms, mild bitter tonic, laxative, Diaphoretic, and diuretic. Leaves are also used in the enlargement of spleen. The leaf juice is used to treat loss of appetite, piles, liver disorders, biliary disorders, intestinal worms, chronic fever, obstinate sciatica, rheumatism, and fever with rigors. The extracted juice of leaves acts as a cholagogue, laxative, and mild bitter tonic. It is given with little sugar to children as a remedy for intestinal aliments. In several cases, it has been found to act efficiently for malaria fever. The decoction of leaves is extensively used by ayurvedic arthritis, obstinate sciatica, malaria, and intestinal worms and as a tonic, cholagogue, and laxative. The nyctanthes arbor-tristis due to its high therapeutic value now a days it is a matter of interest for research in bio-medical science to explore more accurate therapeutic index, in terms of active principles that could be the marker compound of the plant. The nyctanthes arbor-tristis leaves mainly have the medicinal uses like anti-inflammatory, anti-viral, anti-pyretic, anti-bacterial, immunity booster, anti-allergic, and it is also used to treat the arthritic knee pains and sciatica. [2,3,4]

fig[A]

fig[B]

fig: [A] Nyctanthes arbor tristis flowers and fig: [B] Nyctanthes arbor tristis leaves.

DESCRIPTION OF THE PLANT:

Nyctanthes arbor-tristis linn is a large shrub growing to 10m tall, with flaky grey bark, stiff whitish hair, young branches and rough leaves. This shrub grows well in a wide variety of loamy soils and in soils found in average garden situations, with pH-5.6 to 7.5. The plant requires conditions varying from full sunlight to partial shade and needs to be watered regularly, but does not require over watering. It is a terrestrial woody perennial having life span of 5-20 years. The flowers are fragrant, with a five to eight lobed white corolla with an, orange center; they are produced in clusters of two to seven together, with individual flowers opening at dusk and finishing at dawn. Calyx is 6-8mm long, narrowly campanulate, hairy outside, glaborous inside truncate or obscurely toothed or lobed, ciliated. Corolla glaborous and is more than 13mm long; tube is 6-8mm long, orange colour; lobes are white and

unequally obcordate and cuneate. The leaves are opposite, simple, 6-12cm long and 2-6.5cm broad, with an entire margin. The fruit is a flat brown heart-shaped to round capsule 2cm diameter, with two sections each containing a single seed. These are long and broad, obcordate or nearly orbicular, compressed, 2-celled. Seeds are ex-albuminous, testa are thick, outer layer of large transparent cells is heavily vascularized. [5,6]

fig[A] fig[B]

fig:[A] Seeds of nyctanthes arbor tristis and fig:[B] Nyctanthes arbor Tree.

CLASSIFICATION:

Class : Eudicots
Division : Angiosperm
Family : Oleaceae
Genus : Nyctanthes
Kingdom : Plantae
Order : Lamiales
Species : Nyctanthes arbor-tristis

The plant is named in different vernacular languages:

Telugu : kapilanagadustu, Pagadamalle, Parijat, Sepali.
Hindi : Harsinghar, harsingur, seoli, sheoli, sihau.
English : Coral jasmine, night jasmine.
Sanskrit : Parijata, Parijatah, Parijataka.
Odiya : Godokodiko, Gunjoseyoli.
Tamil : Manjhapu, Pavala-Malligai, Pavazha-malligai.
Bengali : Harsinghar, sephalika, seoli, sheoli.
Gujarati : Jayaparvati.
Indonesian : Srigading [Sundanese,Javanese].
Kannada : Goli, harsing, parijiata.
Lao : Salikaa.
Malay : Seri-Gading.
Malayalam : Mannapu, Pavizhamalli, parijatakom,
Marathi : kharbadi, kharassi.
Punjabi : Harsingha.
Filipino : Coral jasmine.
Thai : Karanika.
Urdu : Gulejafari, Harsingar.
Vietnamese : Lai tau. [7,8]

MATERIALS AND METHODS:

1.COLLECTION OF PLANT SAMPLES[LEAVES]: Fresh leaves were collected randomly from surrounding regions. The plants were identified and studied according to their families. Collected leaves were washed under the tap water, shade dried and then homogenized to fine powder and stored in an air tight container.

2.PREPARATION OF LEAVES EXTRACT:

- Fresh leaves were collected from Nyctanthes arbor-tristis and gently washed to remove dust particles.
- Later the leaves were shade dried at room temperature for 20 days and grinded to make a fine powder.
- About 1kg of dried powdered leaves of the plant was extracted by cold maceration using ethanol as solvent for 7days, with intermittent agitation.
- The extract was collected and filtered by using filter paper.
- Then the filtrate was distilled [steam distillation] to remove the excess solvent [ethanol].
- The procedure was repeated until the plant material is completely extracted.
- The concentrated extract is collected and Phyto-chemical screening was performed to identify the chemical constituents.[9]

PHYTO-CHEMICAL CONSTITUENTS OF NYCTANTHES ARBOR-TRISTIS PLANT:

Plant parts	Phyto-constituents
Seeds	3-4 Seco-tri-terpene acid, a pale yellow brown oil, Arbor-tristoside A & , Glycerides of linoleic oleic, lignoceric, Myristic acids, Nyctanthic acid, Palmitic, stearic.
Stem	Glycoside-naringenin-4-0-β-Glucapyranosyl-α-Xylopyranoside, β-Sitosterol.
Bark	Alkaloids, glycosides.
Leaves	Ascorbic acid, Benzoic acid, carotene, D-Mannitol, Flavanol Glycosides-Astragaline, Friedeline, Fructose, Glucose,Iridoid Glycosides, Lupeol, Mannitol, Methyl Salicylate, nicotiflorin,Nyctanthic acid, Oleanolic acid, Tannic acid, β-Sitosterole.
Flowers	Apigenin, Anthocyanin, D-Mannitol, Tanninm, Glucose, Carotenoid, Essential oil, Kaemferol, Nyctanthin, Glycosides, Quercetin, Rengylone, α-Crocetin[or crocin-3], β-Monogentiobioside-β-D, β-Digentiobioside.
Flower oil	Anisaldehyde, α-Pinene, Phenyl acetaldehyde, p-Cymene, 1-Deconol, 1-hexanol methyl heptanone.[10]

ANTI-INFLAMMATORY ACTIVITY:

The water soluble portion of the ethanolic extract of the leaves of Nyctanthes arbor-tristis[NAT] was screened for the presence of anti-inflammatory activity. The present study investigates that Anti-inflammatory activity of nyctanthus arbor tristis leaf extract using carrageenan induced rat paw edema method in albino rats. The rats were induced with paw sub-planter injection of 100µl of a 1% (w/v) suspension of carrageenan in the right hind paw was measured by a paleothermometer. The volume of the paw were compared with the pre-injection values. Carrageenan is a strong chemical that function in stimulating the release of inflammatory and pro-inflammatory mediators which include bradykinin, histamine, tachykinins, reactive oxygen and nitrogen species.[11,12]

Procedure

- The rats were divided into two groups each consists of 2 in number. Group-1is named as cotntrol and Group-2 is named as test.
- Group-1 rats were treated with saline sample at the right hind paw and then after sometime carrageenan is induced.
- Group-2 rats were treated with test sample at the right hind paw and then after sometime carrageenan is induced.
- compare the group-1 and group-2 albino rats and note the inflammation response on both groups.
- The group-1 animals were showing the inflammation due to saline does not have the anti-inflammatory actvity.
- The group-2 animals were shown the anti-inflammation due to test sample consists of anti-inflammatory activity.
- We conclude that the sample having the anti-inflammatory activity.

USES OF NYCTANTHES ARBOR-TRISTIS LEAVES:

- Anti-inflammatory
- Anti-viral
- Anti-bacterial
- Anti- pyretic
- Anti- allergic
- Diabetes control
- It also treated the arthritic knee pain and sciatica
- Dry cough
- Immunity booster
- Gastric problems
- Anti-Diuretics

PHOTO-CHEMICAL ANALYSIS OF NYCTANTHES ARBOR-TRISTIS:

NAME OF CONSTITUENT	TEST	OBSERVATION
1. Alkaloid	1.0ml of plant extract was taken and then add 1.0ml of saturated solution of picric acid.	Yellow colour appears .
2. TANNINS	About 0.5ml of the extract was boiled in 10ml of water in a test tube and then filter the sample and a few drops of 0.1ml fecl3 solution was added.	Brownish green or blue -black coloration appears .
3. CARDIAC GLYCOSIDES	0.5ml of extract was diluted to 5ml in water was added and 2ml of glacial acetic acid containing one drop of fecl3 and it was underlaid with 1ml of conc. sulphuric acid.	A brown ring was formed at the interface. A violet ring was appered below the brown ring. Greenish ring may form just above the brown ring.
4. PHENOL	2ml of extract was taken and add 2ml of Folin's reagent.	Appearance of violet or brown colour.
5. Test for flavonoids	5ml of dil. Ammonia solution were added to a portion of the crude extract followed by addition of conc.H2SO4.	Yellow coloratioin occurs.
6. Carbohydrates: [Moliseh's test]	To 2ml of the extrac, add 1ml of α-napthol solution, add concentrated sulphuric acid through the side of the test tube.	Purple or reddish violet colour at the junction of the two liquids reveals the presence of carbohydrates.
. Fehling's test	To 1ml of the extract , add equal quantities of fehling solution A and B, upon heating.	Formation of a brick red precipitate indicates the presence of sugars.
. Benedict's test	To 5ml of benedict's reagent, add 1ml of extract solution and boil for 2 mins and cool.	Formation of red precipitate shows the presence of sugars.
7. Test for terpenoids	5ml of extract was mixed with 2ml of chloroform and 3ml of conc.H2SO4 was carefully added to form a layer.	A reddish brown coloration of the interface was formed.
8. Saponins	• 0.5g of extract was added in 5ml of distilled water in a test tube. The solution was shaken vigorously. • The frothing was mixed with 3 drops of olive oil and shaken vigorously.	Stable persistent froth appears. Formation of an emulsion.
9. Test for anthraquinone glycosides	To 200mg of each extracts dil. Sulphuric acid was added and boiled. Then it was filtered and cooled. To the cold filtrate.3ml of benzene was added and mixed. The benzene layer was separated and to it, ammonia[2ml] was added	Ammonical layer was observed.
10. Test for proteins and amino acids: Biuret test:	Add 1ml of 40% sodium hydroxide solution and 2 drops of 1% CuSO4 solution till a blue colour is produced, and then add 1ml of the extract	Formation of pinkish or purple violet colour indicates the presence of Proteins. [13,14,15,16]

RESULTS AND DISCUSSION:

HEMICAL TEST	RESULT
Test for Alkaloid	Positive
Test for Tannins	Positive
Test for Cardiac glycosides	Positive
Test for Phenol	Positive
Test for Flavonoids	Negative
Test for Carbohydrates: Molisch's test: Benedicts test: Fehling's test:	 Positive Positive Positive
Test for Terpenoids	Positive
Test for Saponins	Positive
Test for Anthraquinone glycosides	Negative
Test for proteins and amino acids Biuret test:	Positive

CONCLUSION:

We conclude that many secondary metabolites We conclude that many secondary metabolites were present in the leaf extract of nyctanthus arbor tristis. The extraction was done by using the cold maceration followed by simple distillation process. The review article revealed that the importance of ayurvedic and herbal pathways for effective treatment of various diseases and it also have potential pharmacological activites. It is also having a rich source of biologically active compounds. The extract contains the chemical constituents which are responsible for anti-inflammatory activity by using the rat paw edema method. Hence Nyctanthes arbor tristis having the anti-inflammatory activity.

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