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Review

A REVIEW ON THE ANTI-INFLAMMATORY ACTIVITY OF NYCTANTHES ARBOR TRISTIS (PARIJATA)

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Abstract

Nyctanthes arbor tristis, commonly known as the night-flowering jasmine. Nyctanthes arbor tristis has been traditionally used for its various therapeutic properties, including anti- inflammatory, analgesic, anti-pyretic, anti-microbial, and hepatoprotective effects. Various parts of the plant are used medicinally to cure various diseases since centuries ago.

It is a rich source of important phytochemicals like nycanthine, astringent principle, beta cortisol, coloring matter, tannins, flavonoids, cardiac glycosides, saponins and alkaloids etc. Pharmacological actions of Harsinghar include cholagogue, anthelmintic, laxative, antipyretic, diaphoretic, diuretic; for which the the plant is employed in the treatment of skin disorders, dandruff, malaria, different types of fever, hemorrhoids, palpitation, cough, excessive menstrual bleeding menstrual etc.

Medical importance

- Help relieve fever, cough, and cold
- Reduce inflammation and pain
- Support digestive health

Keywords: Nyctanthes arbor tritis, Antipyretic, Analgesic, Anti inflammatory, Arithritis.

INTRODUCTION

Nyctanthes arbor-tristis, commonly known as the night-flowering jasmine or the Parijat tree, holds a significant place in traditional medicine due to its various pharmacological properties. The plant has been extensively studied for its potential therapeutic benefits, including anti-inflammatory, analgesic, anti-pyretic, anti-microbial, anti-arthritic, and hepatoprotective activities.

The Nyctanthes arbor-tristis is a shrub or tree having fragrant flowers The plant generally grows in the tropical and subtropical regions. Nyctanthes arbor-tristis is called as"Tree of Sorrow" because of the lass of the flowers their brightness during day time. The plant name arbor-tristis means the sad tree.

The whole plant having various medicinal activities like anti-fungal, anti-diabetic, anti-oxidant. Arthritis means joint inflammation and it is chronic autoimmune disease occurs in any age group of peoples. The most common form of arthritis are Osteoarthritis and Rheumatic arthritis. Arthritic conditions tend to involves pain, aching stiffness and swelling in and around one of more joints. The symptoms can develop gradually or suddenly .

The nig ht-flowering jasmine, Nyctanthes arbortristis, is a native of northern India and southern Asia and a member of the Oleaceae family. With flaky grey bark, it is a tiny tree or shrub that can reach a height of 10 metres. The simple, opposin g leaves measure six to Twelve cm in length and 2- 6.5 c m in width. The complete margin and provide beneficial th erapeutic qualities. The fragrant flowers have 5 to 8 lobes.White corolla tube with orangered core; two to seven clust ers are generated. individually, with each flower blooming f rom twilight to dawn. The blossoms and seeds and leaves have antiviral, hepatoprotective, antileishmanialimmunosti mulant and antifungal properties.

Scientific Classifation

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Lamiales
Family : Oleaceae
Genus: Nyctanthe
Species: arbor-tristis
Binomial name:arbor-tristis

Chemical constituent found in one of a kind

Parts of night jasmine and their biological activities.

	Chemical Constituents	**Biological Activity**
Seeds	Arbortristoside A & B, linoleic acid, oleic acid, stearic acid, palmitic acid, myristic acid, d-pentahydroxyl alcohol, secoiridopeanacid	Antibacterial, antileishmanial, antifungal, immunomodulatory
Flowers	Essential oil, nyctanthin, D-mannitol, tannins, glucose, carotenoids, β-monogentiobioside, β-D-monoglucoside ester of α-crocin, glycosides, β-digentiobioside ester of α-crocin	Diuretic, antioxidant, anti-inflammatory, anti-bilious, sedative, antifilarial
Leaves	D-mannitol, β-sitosterol, flavanol glycosides, astragaline, nicotiflorin, oleanolic acid, nyctanthic acid, tannic acid, ascorbic acid, methyl salicylate, friedelin, lupeol, mannitol, glucose, fructose, iridoid glycosides, benzoic acid	Antibacterial, anthelmintic, anti-inflammatory, hepatoprotective, immunopotential, antipyretic, antioxidant, antifungal
Stem	Glycoside (naringin), β-glucopyranosyl-4-xylo-pyranoside, β-sitosterol	Antipyretic, antioxidant
Bark	Glycosides and alkaloids	Antimicrobial
Flower Oil	α-pinene, p-cymene, 1-hexanol, methyl heptanone, phenylacetaldehyde, 1-decanol, anisaldehyde	Used as perfume

Medicinal uses of Nyctanthes arbor-tristis:

Nyctanthes arbor-tristis is most vital in local and traditional medicines especially in India for treating intermittent fevers, arthritis and obstinate sciatica. Crude extracts and isolated compounds from the plant were shown to be pharmacologically active against inflammation, malaria, infection, leishmanisis and as an immunostimulants. bioactive compounds of Nyctanthes arbor-tristis are very useful to impress menstruation, treatment of scabies and other skin infections, as a toiletries, chalogogue, laxative, diaphoretic, diuretic, treatment of arthritis, malaria, bronchitis's and anti-helminthic.

Seeds: Seeds employed in diabetes, also in cutaneous diseases. Filaments— astringent and cooling; prescribed for bleeding piles and menorrhagia. Plant—toxic on the nervous system.

Seeds of nyctanthes arbor tristis

Leaves: The leaves of Nyctanthes arbor-tristis Linn are used extensively in Ayurvedic medicine for the treatment of varied diseases like sciatica, chronic fever, rheumatism, and internal worm infections, and as a laxative, diaphoretic and diuretic. Leaves are utilized in cough reduction. 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 vital sign and diabtes. The extracted juice of leaves acts as a cholagogue, laxative and mild bitter tonic.

Leaves of nyctanthes arbor tristis

Flowers: The flowers are used as stomachic, carminative, astringent to bowel, expectorant, toiletry and within the treatment of piles and various skin diseases and within the treatment of ophthalmic purposes. The corolla tubes were formerly used for dyeing silk, sometimes along with Safflower.

Flower of nyctanthes arbor tristis

Bark: The bark used as a tanning material and also the leaves sometime used for polishing wood and also the ivory.The bark contains glycosides and alkaloids an useforvariouspurposes. Sometime bark is incredibly useful for wound.

Stem: The branches are somewhat flexuous (bending and twining) and are sparsely finely hairy (pubescent) with simple hairs. The smaller twigs especially, exhibit these hairs. The stems contain the glycoside naringenin-4-0-β-glucapyranosyl-α-xylopyranoside and β-sitosterol.

MATERIALS AND METHODS

Meterials

Nyctanthes arbor-tristis leaves were collected from the local area dried, powdered and used as an antipyretic, analgesic, anti-intiammatory to cure arthritis, joint pains etc. The excipients used in the formulation are Methylcellulose is used as disintegrate, Magnesium stearate is used as a lubricant, Lactose is used as the diluent, Tale is used as a lubricant and gives the pleasant appearance to the tablet. Sodium alginate these three excipients are used as the binder for thepreparation of wet granulation.

Method

Preparation of dry powder of nyctanthes arbor tristis leaves: Collection of fresh leaves of Nyctanthes arbortristis from the local area. Clean the leaves by using distilled water. Leaves are dried at room temperature for afew days. The hot air oven is used for the complete drying of leaves. The dried leaves are collected and grind in a mixerto make a fine powder.

Preparation of 2% acacia solution: Take 200 ml distilled water in a beaker. Take 2 gm of acacia powder and mixin 200 ml distilled water. Stir continuously until all powder was mix properly.

Preparation of 2% HPMC-K4M solution : Take 200 ml distilled water in a beaker. Take 2 gm of HPMC-K4M powder and mix in 200 ml distilled water. Stir continuously to form a jelly-like appearance.

Preparation of 2% sodium alginate solution : Take 200 ml alcohol in a beaker. Add 2 gm of Sodium alginate powder in 200 ml alcohol. Stir properly to mix well

FORMULATION OF TABLET

In this formulation, the dried leaves powder of Nyctanthes arbor tristis was used to form a tablet dosageform. The formulation was done by the wet granulation process and further compression by in tabletpunching machine. Once formulated, the tablets need evaluation for parameters like weight variation,hardness, friability, disintegration time, and dissolution tests to ensure quality and efficacy.

Coating of Herbal Tablet:-HPMC is a versatile coating material, it can be used for enteric coating tablet. Spraycoating and incorporation method is used for herbal tablet coating.Wet granulation is a common technique

used in pharmaceutical manufacturing to form granules by adding aliquid binder to a powder mixture. For herbal tablets containing Nyctanthes arbor tristis (also known as thenight-flowering jasmine or Parijat), wet granulation can be employed to improve tablet compaction,flowability, and uniformity of drug distribution. It involves several steps:

1) Material Selection: Choose suitable excipients such as binders, fillers, and disintegrants. Commonbinders include starch paste, gelatin solution, or cellulose derivatives.

2) Powder Mixing: Blend the herbal powder of Nyctanthes arbor tristis with other excipients uniformly.

3) Wetting: Add the liquid binder gradually to the powder mixture while mixing until the powder particlesadhere and form granules.

4) Granulation: Continue mixing until the wet mass reaches the desired consistency. The wet mass is thenpassed through a sieve to obtain granules of uniform size. Passed from sieve no.22.

5) Drying: Dry the wet granules using appropriate methods such as tray drying, fluid bed drying, or ovendrying to remove moisture.

6) Sizing: After drying, sieve the granules to achieve the desired particle size range.

7) Tablet Compression: Finally, compress the dried granules into tabletsusing a tablet punching machine. Formulation table : Weight of each tablet 500 mg .

EVALUATION

General appearance:

The general appearance and color of tablets were found by visual determination.

Hardness: For each formulation, the hardness and thickness of 20 tablets were determined. Hardness test was determined by Monsanto hardness tester.

Formulation	Hardness (kg/cm3)
F1	7.81
F2	7.85
F3	7.90

Thickness:

Thickness of tablets was determined by Vernier Calipers.

Formulation	Thickness (mm)
F1	4.45
F2	4.67
F3	4.83

Weight variation test:

The weight variation test was performed by following procedure. Weight 20 tablets individually and consideras X1, X2, X3,…. .X20. Determine the average weight of 20 tablets X= (X1+X2+X3+….+X20)/20. Theindividual weight was compared with the upper limit and lower limit. Not more than two of the tabletsdiffers from the average weight by more than the % error listed, and no tablets differ by more thandouble that percentage.

Formulation	Friability(%)
F1	0.21
F2	0.20
F3	0.23

Friability:

Friability of a tablets can determine in a laboratory by Roche friabilator. The friabilator consists of plastic chamber that rotates at 25rpm, dropping the tablets through a distance of six inches in the friabilator, which is then operated for 100 revolutions. The tablets are reweighed. Compress tablets loss less than 0.5% to 1.0% of the tablet weight are considered acceptable

Formulation	Friability(%)
F1	0.21
F2	0.20
F3	0.23

Disintegration time:

This test was a time required for the tablet to separate into particles, the disintegration test measure only of thetime required under a given set of a conditions for a group of tablets to disintegrate into particles. Thistest was performed to identify the disintegration of tablet in a specific time period.

Dissolution test: The dissolution studies were carried out using USP 2 paddle apparatus.Paddle was allowed to rotate at 50rpm

FORMULATION OF CREAM:

Materials Required:

* Fresh Night Jasmine flowers or leaves
* Distilled water
* Coconut oil or almond oil
* Beeswax (or emulsifying wax)
* Borax (optional, for emulsification - use very small quantity)
* Mortar and pestle
* Beaker
* Water bath
* Filter cloth or sieve
* Glass jar or cream container

Procedure:

Step 1: Preparation of Night Jasmine Extract
1. Wash the flowers/leaves thoroughly with clean water.
2. Crush them using a mortar and pestle.
3. Add a small amount of distilled water.
4. Heat gently in a water bath for 10-15 minutes.
5. Filter the mixture using a clean cloth to obtain the extract.

Step 2: Preparation of Oil Phase

1. Take coconut oil (oi simond oil) in a beaker.
2. Add beeswax to it.
3. Heat gently until the wax melts completely.

Step 3: Preparation of Aqueous Phase

1. Take the Night Jasmine extract in another beaker.
2. Warm it slightly.
3. (Optional) Dissolve a very small pinch of borax in it.

4. Step 4: Cream Formation

1. Slowly add the warm aqueous phase to the oil phase.
2. Stir continuously in one direction.
3. Continue stirring until the mixture cools and thickens into a cream.

5. Step 5: Storage

1. Transfer the prepared cream into a clean glass container.
2. Label and store in a cool place.

Observation:

The cream is smooth and pale-colored.
* It has a mild natural fragrance of Night Jasmine.

EVALUATION TEST:

1. Physical Evaluation:
Colour: Visual inspection
Odour: Characteristic / pleasant
Appearance: Smooth, uniform, free from grittiness
Consistency: Semi-solid, smooth texture
2. pH Determination:
Measure using a digital pH meter
Ideal pH range: 5.5 – 7.0 (skin-friendly)
3. Spreadability Test:
Purpose: Measures ease of application
Method: Place cream between two glass slides
Apply weight (500 g) for 5 min
Measure diameter spread
Formula:
S=M*L/T
M = Weight tied to upper slide
L = Length moved
T = Time taken
4. Viscosity:
Determined using Brookfield viscometer
Confirms proper thickness and flow property

DISCUSSIONS AND CONCLUSION

Nyctanthes arbor-tristis was a traditional medicinal plant which having various medicinal activity but present research was focused on Arthritis and antipyretic, analgesic a n d anti-inflammatory activity. The leaves powder was used to formulate tablets. Wet granulation was done by using different binders and making three batches like F1,F2,F3. pre-formulation study was carried out and gives good flow properties ofprepared granules. The compression of prepared tablets, were evaluated and gives satisfactory results. The batch F3 was more disintegration time as compared to F1 and F2 batch. Based on the results it is concluded that the formulation a n d evaluation a r e pharmacological evaluation is required for the treatment of Arthritis. herbal cream formulated using Nyctanthes arbor-tristis possesses acceptable pharmaceutical characteristics and can be considered a promising topical formulation with potential anti-inflammatory activity. Further pharmacological and clinical studies may be carried out to establish its therapeutic efficacy and commercial applicability.

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