



# STUDIES OF ANTIPIRETTIC ACTIVITY OF LEAF EXTRACT OF *NYCTANTHES ARBOR-TRISTIS* LINN. (NIGHT JASMINE)

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**Abstract:** -*Nyctanthes arbor-tristis* Linn is known to be one of the extremely useful medicinal plants in South Asia. The popular medicinal use of this plant is anti-helminthic and anti-pyretic besides it is used as laxative, rheumatism, skin alignment and as a sedative. Vitally, it is native plant present in the home gardens to pass on its medicinal uses to on coming generations. It was observed that the leaves of the plant are used in treating fever. The present work is an attempt to make isolation of the phytochemical constituent and mechanism of pharmacological actions with focus on pyretic conditions. The present study includes comprehensive information on the chemical constituents, biological activities of important compounds, pharmacological actions, medical applications and micro propagation of night jasmine and emphasizes the need in Ayurveda *Nyctanthes arbor-tristis* Linn. is termed as mythological plant with enormous medicinal value. The present study was performed for establishing the quality standards of the leaves as per World Health Organization (WHO) guidelines to confirm its purity and authentication. Leaf juice is protected laxative for new born children and is utilized in treatment of steady fevers mix with various species. This article gives the suitable paediatric emulsion for antipyretic activity. The chemical constituents (terpenoids) are responsible for potent antipyretic activity. Extract where concentrated analysed by UV (ultra violet spectroscopy) for checking ability of the chemical compounds to absorb UV (ultra violet spectroscopy) light and it shows absorption features in the visible region. This technique is to investigate and quantify leaf extract and useful medicinal compounds. This study highlights crucial role of terpenoids in the formulation. From all observations it shows this paediatric emulsion has the antipyretic activity.

**Keywords:** -*Nyctanthes arbor-tristis* Linn, Antipyretic, Emulsion, Paediatric, Ayurveda

**Introduction:**-*Nyctanthes arbor-tristis* Linn. a well-known plant in India, also known as night time flowering sad tree belonging to family *Oleaceae* (*Nyctaginaceae*). It is widely cultivated in tropical & subtropical areas all over the world<sup>[1]</sup> It is a terrestrial woody perennial having life span of 5-20 yrs. It is mostly a shrub or small tree having fragrant plant life, which bloom at night & fall of before sunrise, giving the floor below a pleasant combination of white & crimson. It is likewise referred as "Tree of sadness" because at same point of the day the plant loses all its brightness. It is also referred as *Harsinghar*, Coral Jasmine *Parijat*, queen of night & Night Jasmine etc. Every part of the tree has been used as traditional medication for family remedies against numerous human illnesses from antiquity. In Ayurvedic system *Parijat* leaves was used to treat a various condition such as, pyrexia, cough, arthritis, worm infection etc. The leaves juice is bitter and works as a tonic. The *kwath* & decoction is excellent for arthritis, constipation, fever, worm infestation. *Parijat* leaves provide various health effects due to the presence of antipyretic (fever controlling), antibacterial, anti-inflammatory, anthelmintic (parasitic worm expeller) properties, analgesic activity etc. In Ayurveda, Night Jasmine leaves has been used as an aphrodisiac and means to increase immunity and fight fever, an infusion of Jasmine tea is beneficial in treating fevers. The paste prepared from leaves is useful in fever, high blood pressure and diabetes. Due to this expectorant activity, juice of this leaf is used in treatment of cough. Leaf juice with honey three times a day, is useful in treatment of fever, cough<sup>[2]</sup> Generally the leaves of Night Jasmine are used in a variety of dosage forms, including juice powder decoction and sticky material, to treat a variety of illness<sup>[3]</sup>

## Scientific Classification:-

Kingdom – Plantae  
Division – Magnoliophytes  
Class – Magnoliopsida  
Order – Lamiales  
Family – Oleaceae  
Genus - *Nyctanthes*  
Species - *N.arbortristis*  
Binomial name – *Nyctanthes arbor-tristis*



Figure no.1:-leaves of night jasmine

**Vernacular Name:-**

Family – Oleaceae, Nyctanthaceae

Unani – Harasingaar

Sanskrit – *Parijatha*

Siddha – Pavazhamattigai

Hindi – Harasingaar

English – Tree of sorrow, Night Jasmine, Coral Jasmine

Marathi – *Parijathak*Kannada – *Parijatha*<sup>[3]</sup>**Chemical Constituent of Night Jasmine Leaves:-**D-mannitol,  $\beta$ -sitosterole, Flavanol glycosides-Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, tannic acid, ascorbic acid, methyl salicylate, carotene, friedeline (Terpenoids), lupeol, mannitol, Glucose and fructose, benzoic acid, iridoid glycosides.<sup>[2,8]</sup>**Materials and Methods:**

Collection of the plant samples:-Plant Materials: - The fresh leaves of Night Jasmine (*Nyctanthes arbor-tristis*) are known in many names in local language. The various parts of the plants are useful in many diseases. Fresh leaves of *Nyctanthes arbor-tristis*Linn. were used. The leaves were dried to obtain powder and weighed. Night Jasmine dry powder used about 20gm, distilled water 300 ml is used as extraction solvent, for decoction hot plate is used.

**Method used for preparation of leaf extraction:**

The plant leaves were collected from the premises of Lokmangal College of Pharmacy, Wadala, North Solapur. The green foliage was collected in the month of October. The leaves were allowed to dry in shade for 10 days. Crushing method is used for obtaining the dry powder. The distilled water is used as solvent for extraction of leaves; the extract which was obtained after the decoction was further filtered using filter paper. The water content from the leaf extract was removed by using hot plate apparatus for 20 min. & dark brown, sticky leaf extract is obtained. This extract (*Nyctanthes arbor-tristis*Linn.) was subjected to screening for antipyretic activities.



Figure no.2:-filtration &amp; extraction

**Phytochemical analysis of *Nyctanthes arbor-tristis*:-**

**Qualitative Phytochemical Screening:** -*Nyctanthes arbor-tristis* with distilled water or chloroform extract were subjected to various qualitative tests for the identification of plant constituents present in this species.<sup>[4]</sup>

**Test for Alkaloids** -1.0ml of plant extract was taken and then added 10 ml of saturated solution of picric acid was added the occurrence of yellow colour appearance indicates the presence of alkaloids in the Sample extract

**Test for Terpenoids:** - It is also known as Salkowski test. In this test 5ml of extract was mixed with 2ml of chloroform and 3ml of conc. Sulphuric acid was carefully added to form a layer. Terpenoids presence is confirmed by a reddish brown colouration of interface.<sup>[4]</sup>

**Test for Phenols:** - 2ml of plant extract was added with 2ml of folin's reagent. A violet or brown colour solution showed the Presence of phenolic compound.<sup>[5]</sup>

**Test for Flavonoids** :- 5ml of dil. Ammonia solution were added to a portion of the crude extract followed by addition of conc. Sulphuric acid, presence of flavonoids is indicated upon production of an intense yellow colour.<sup>[4]</sup>

**Analytical Test:**-Extraction is a classical analytical technique used to determine the contents of various organic & inorganic species. The target analyte is thus isolated from the original sample & transferred into an extract. The isolation of terpenoids was done by column chromatographic technique using the solvent i.e. chloroform, distilled water, petroleum ether, hexane etc.

These terpenoids showed potent antipyretic action & reduced the fever. These compounds were terpenoids which are confirmed by Salkowski test, spectroscopic data of UV, chemical shift of UV shown the permeability of mono-terpenoids and sesquiterpenoids. [4,6]

**UV Spectroscopy:** - The UV spectra of isolated compound were obtained using Perkin Elmer UV Spectrometer. The spectrum was obtained 200-400 nm. Range  $\lambda$  max: - 235.5nm.

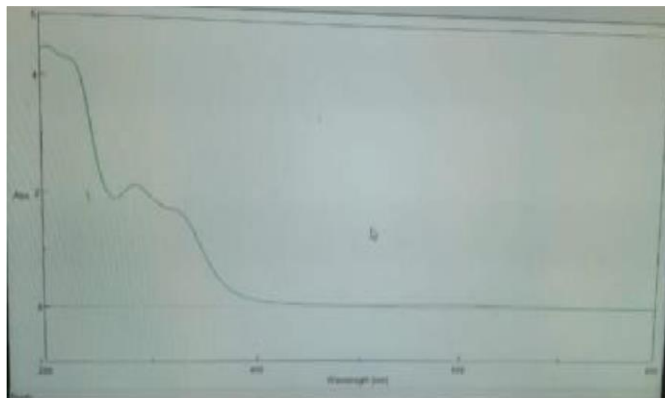


Figure no.3:- graph of uv spectroscopy

**Formulation of Emulsion:**-The sticky material obtained from the leaf extract is further proceeded to prepare pediatric emulsion which shows the antipyretic activity. As our extract is water soluble so, we prepared oil in water type of emulsion. We used standard ratio of proportion is 4:2:1 (Oil: Water: Gum), the *Nyctanthes arbor tristis* Linn. isolated terpenoids (200gm/kg) shown significant antipyretic action<sup>[6]</sup>. Gum tragacanth was weighed accurately 2.8 gm. (as an emulsifying agent) and then we had put it in mortar and pestle. Gum was then triturated with drug extract (5gm) clicking sound comes. Once the clicking heard castor oil (11.2 ml) is added in it and once again triturated in it till the clicking sound. Once we get the clicking sound our emulsion is ready. To get desired viscosity distilled water (5.6ml) is added. Methyl Paraben mixed with Caster oil and boiled to protect it from microbes.



figure 4: emulsion

#### Microscopic Evaluation of Formulation:-

The obtained formulation was studied under microscope and found it was Oil in Water emulsion.



figure no.5:-microscopic evaluation of emulsion

#### Result:-

*Nyctanthes arbor-tristis* Linn.is very important in local and traditional medicines mostly in India for treating fever, chronic arthritis and obstinate sciatica. Crude extract showing pharmacological activity against inflammation, malaria, viral, infection, leishmaniasis and an immune stimulant were extracted and isolated. The major class of biologically active compounds are the iridoid glycosides including, Arbortristoside A, B and C from the seeds active as anticancer, antileishmania, antiinflammatory, anti-allergic, immunomodulatory and antiviral.

**Discussion:**

We have reported earlier the anti-pyretic activity of the water soluble portion of an extract of the leaves of *Nyctanthes arbor-tristis* in a number of experimental models representing the various constituents. The *Nyctanthes arbor-tristis* Linn. was also reducing pyrexia significantly as well as showing presence of antipyretic & analgesic activities in addition to the anti-inflammatory.<sup>[7]</sup> From ancient time leaves of this plant were used in the treatment of irregular fever in malaria. Further, research work and clinical trials need to be done to establish the above mentioned effects in human beings.

**Conclusion:-**

Various useful metabolites such as alkaloids, phytosterols, terpenoids, phenolics, tanins, flavonoids, glycoside and saponins are found in *Nyctanthes arbor-tristis* Linn. medicinal plant. The above constituent which we had mentioned shows the antipyretic activity. *Nyctanthes arbor-tristis* Linn. leaf juice is useful in sciatica rheumatism and fever, Because it has mild purgative in activity. It is also used in constipation for childrens, also from chemical test we had proven that our extract gives antipyretic activity and we can conclude that the selected leaf extract were showing many secondary metabolites are present as we had proven it by doing UV and chemical test. Secondary plant metabolites (phytochemicals) such as Terpenoids, methyl salicylate and other previously known pharmaceutical activities, have been extensively investigated the antipyretic activity and phytochemical analysis of *Nyctanthes arbor-tristis* Linn and secondary metabolite present in it.

**Future Scope:-**

It also has a promising future in Nano science food, and textile industries, cosmetics & other fields. Additionally, metabolic analysis in recent times has encouraged its wide use in curative pharmacological applications. *Nyctanthes arbor-tristis* Linn. plant offer a wide range of pharmacological properties may be therapeutically beneficial for population, health, and wellbeing; thus further clinical research is also required so all pharmacological research has been preliminary such as Anticancer activity, Anti-malarial activity, Hepatoprotective activity, Anti-diabetic activity, Anti-allergic, Immunomodulatory, Antiviral, Antiaggressive, Anti-filarial activity, Anti-arthritis activity etc.

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