



Antimicrobial and Antioxidant Activities of the parijat

(*Nyctanthes arbor-tristis*) Plant extract

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Abstract

Nyctanthes arbor-tristis linn (Parijat) are quite possibly the most helpful customary restorative plant. Despite its status as an ornamental shrub, the parijat plant has numerous medicinal and pharmacological properties. The history and introduction of the parijat plant, as well as its taxonomic classification, are included in this review article, as are all of the relevant details about the plant's distribution and phytochemical constituents. Additionally, the procedure for extracting the plant and the pharmacological treatments that are carried out on its leaves are described. *Nyctanthes arbor-tristis* can also be used to make medical and industrial products. It has chemical components like essential oils, flavonoids, tannic acid, glucose, and benzoic acid, all of which are very useful. It also has phytochemical tests, traditional uses, and proven pharmacological actions.

Key words: Antibacterial, antioxidant, parijat.

1. Introduction

Nyctanthes arbor-tristis usually known as Parijataka (Daund and Vikhe). *Nyctanthes arbor-tristis* are belonging to the family of Oleaceae. It is also called night flowering jasmine (Rani et al.

2012). Parijat is one of the well-known plants not only for its aroma but also for their great medicinal values. Scientific name of the plant is *nyctanthes arbor-tristis* also called a Harit sagar (Tripathi and Srivastava 2021). *Nyctanthes arbor-tristis* is a very valuable medicinal plant. This plant mostly grows in tropical region the general name of this *Nyctanthes* has been generated from two Greek words 'Nykhta' (night) and 'anthos' (flower) (Jain and Pandey, n.d.) 1 (Manisha, Neha, and Satish 2009) 2. (Meshram et al., n.d.)

Herbal drug are recognized such as botanical medicine or phyto-medicine refers in the using plants seeds, flowers, roots used for medicinal purpose (Chappidi et al. 2013). Consequently during the day parijat plant loses all its brightness such as this parijat is called "Tree of sadness" It is also called as harsingar coral Jasmine is queen of night 5. (Kiew and Baas 1984).(RANI et al., 2011). Range of rainfall seasons of this parijat plant In India it growing in Himalayan Region is spread across 13 Indian States Union Places these name are Jammu and Kashmir, West Bengal, Tripura and Godavari (Upadhyay and Sharma, n.d.). It is a *Nyctanthes arbor-tristis* of India, circulated in sub-Himalayan region as well as found in Indian garden for example ornamental plant.

Nyctanthes arbor-tristis Linn is known for its extensive traditional medicinal make use of rural mainly tribal people of India along with its use in Ayurveda siddha and unani system based on medicines PARIJAT Plant leaves for the most part contain flavonoids,

saponins, sterols, Glycosides, tannins proteins, carbohydrates (Shekhar, n.d.) Seeds are containing palmitic acid, linalool, stearic acid ETC (Kaur and Kaushal 2020).

In the time of India it is the most helpful conventional remedial plant parijat is considered as a very important and unique medicinal product then also have industrial importance (Bhalakiya and Modi 2019) The plants have being widely cultivated in gardens almost in every part of this

plant in use in fragrant flowers he is regularly used in the most pleasant and peculiar fragrance also used in make a perfume (Jain and Pandey, n.d.) (Sandhar et al. 2011) The main point of the present investigation into characterize the leaves of parijat plant find out its effect at on the microbes on their present study in work at phytochemical analysis For the current work the plant was collected from the garden nursery to collect a leaf sample of Parijat plant in prepare plant extract (Suresh and Arunachalam, n.d.) For example as a Result the Training goal Look into their chemical contents of this solvent leaf extracts are present in their anticancer as well as anti-inflammatory properties (DM, Dhakne, and Patil 2022) These plant Species must have conventionally improved scientific and commercial attention in recent Year (Upadhyay and Sharma, n.d.)

Herbal Medicine occurs not only provided that traditional and ethnic medicine otherwise than also promising highly efficient novel bioactive product (Daund and Vikhe n.d.) The focus of this present review and application of some others important plant secondary metabolites and communication deals with the brief introduction, classification recent improvement of production, antimicrobial properties and importance of plant secondary metabolites (Tiwari and Rana 2015) Different sources of Pharmaceuticals, food Additives, flavours and other industrial materials (Tiwari and Rana 2015)

Making this herbal medicine Purpose for used for this Potential in Phytochemicals and Pharmacological action. Every part of the tree has been used as traditional remedies against various human ailments from antiquity (Rani et al., 2011). *Nyctanthes arbor-tristis* are used for this multiple pharmacological activity like antibacterial, anthelmintic, anti-inflammatory, hepatoprotective, anti pyretic, antioxidant and Anti- fungal activity (N. Verma and Yadav 2020)

2. Plant profile

Parijat plant leaf and flower are uses in pharmaceutical, homeopathic, and many spiritual activities. Parijat flowers have seven into eight petals arranged on an Oranges-red stem This Parijat plant small tree is growing up to 10 m tall with flaky bark which is widely cultivated all over in India (Vajravijayan et al. 2013) Therefore according to vastu planting this tree at home in the right direction will fill your house with happiness and good fortune. Parijat is also called ‘Rat Rani’ (Anonymous).

Taxonomical Classification

Name of the plant – *Nyctanthes arbor-tristis* (Daund and Vikhe n.d.)

Synonyms – Night jasmine

Kingdom – Plantae

Division – Magnoliophyta

Class – Magnoliopsida

Order – Lamiales

Family – Oleaceae

Genus – *Nyctanthes*

Species – *arbor-tristis*

Binomial name – *Nyctanthes arbor-tristis*

Different languages Name of Harsinghar:

English: Coral, Night Jasmine (DM, Dhakne, and Patil 2022) (Khandelwal and Kadam 1999)

Hindi: Harsinghar, Seoli, Sihau

Sanskrit: Parijata, Sephalika

Gujarati: Jayaparvati, Parijatak

Marathi: Kharbadi, Kharassi, Parijatak

Tamil: Manjhapu, Pavala- Malligai

Malayalam: Mannapu, Parijatakam

Bengali: Harsinghar

Punjabi: Harsinghar

Characteristic Features and Various Parts of Harsinghar

Morphology

Leaves: Parijat Plant leaves are acute or acuminate, oval in whole leaves are with a few huge (DM, Dhakne, and Patil 2022) Harsinghar leaves are rough and hairy and hard. (Bhalakiya and Modi 2019) (Sah and Verma 2012) Leaves and bark are said to be anti-bilious and cough syrup. Leaves are simple, Petiole, and stipulate. So this leaves upper surface is dark green with dotted glands, and the lower surface is pale green and softly pubescent (Bhalakiya and Modi 2019)

Flowers: Nyctanthes arbor-tristis are the most delightful flower in India. Nyctanthes arbor-tristis flower is a large shrub growing 7-10 meters tall. Flowers are arranged in clusters on the tips of branches or in axils at the leaves (Jain and Pandey, n.d.) This parijat plant flower it is the official flower of the state, west Bengal, India. The lovely and attractive white flower is bitter in taste.

Fruits: Nyctanthes arbor-tristis fruit are separating into 2 flat 1- plant seeded carpels (Jain and Pandey, n.d.) This parijat plant fruit is blobbed each one lobe containing a single seed

(anyonms). Macroscopic character is showing off these fruit is flat, brown and cordate hearts designed shaped to rounded-capsule are around 2 cm. in diameter (Jain and Pandey, n.d.)

Climate factors: This plant well flourishes in loamy soils and semi-shady areas, requiring a, PH of 5.6-7.5 this PH are also required in growing, leaves, flower, and fruit.

Flowering seasons of parijat plant: These Nyctanthes arbor-tristis flowering seasons are September to October this season are the best season to grow parijat plant leaves flower.

Properties and uses of Nyctanthes arbor-tristis: Parijat plant have many properties and medicinal uses because parijat uses Different part of like seeds, leaves, flowers, bark and fruit have some medicinal value used with folk remedy used in the treatment of various diseases like chronic fever and sciatica parijat stem bark is used in bronchitis (4, 6). These parijat stem powders are good to treat malaria and joint pain parijat leaves using a making of kadha to uses colds, coughs, fevers. This leaves juice are also used in tonics (Riddhi parmar 2022). Parijat plant are using in Indian systems of medicine for various purpose (Pandey and Jain 2013) Bark in combination with Arjuna sadada is considered to be useful with- in internal injuries and healing about damage including fractured bones (Daund and Vikhe n.d.)

3. Pharmacological Properties

Various types of pharmacological activities are present in Nyctanthes arbor-tristis Linn. So Plants propose wide-range of many pharmacological properties so it is possible to be therapeutically beneficial for well-being, health, and population

1. Antimicrobial activity

Antimicrobial Activity is against microorganisms the plant have antimicrobial activity mainly in the leaves, barks, and Seeds (Upadhyay and Sharma, n.d.)The Certain drug or chemical

compound has the effect to kill the microorganism they will inhibit their growth (Anonyms). *Nyctanthes arbor-tristis* are showing more antimicrobial activity as compared to methanol and ethanol (Upadhyay and Sharma, n.d.) Check-in different extracts like hexane, chloroform, and petroleum ether. So antimicrobial activity is performed two methods first well diffusion method and the second one is well disc method I am using petroleum ether extract to leaves so exhibition in the highest zone of inhibition against this (*P. aeruginosa* and *R.stolonifer*) are the most common fungi in the word and found in the tropical and subtropical region (Anonyms). I got results indicating the leaves of this parijat plant might be a potential source of treatment diseases against in test organisms (Paul et al. 2018) Using another method result is acetone extracting of parijat plant leaf is more effective than aqueous extract.

2. Antioxidant activity

Plants are producing potent antioxidants property also use *Nyctanthes arbor-tristis* leaves as Ayurvedic medicine for many ailments (Bhalakiya and Modi 2019) (Sasmal, Das, and Basu 2007)(Sanjita, Dinakar, and Basu 2010). Anti-oxidant activity of classes compounds which in scavenging and the free radicals mostly responsible for the pathogenesis. Now a living organism and free radicals are generated such as the important significance of the body's normal metabolic activity (N. Verma and Yadav 2020;Panigrahy et al. 2017). A previous study also explaining in antioxidant activity is determined using this DPPH test, free radical scavenging activity, and reducing power assay are total antioxidant capacities.

The plant was showing have a significant degree of antioxidant activity (J. Singh, Singh, and Singh 2021) (Lal 1936) (Sanjita, Dinakar, and Basu 2010) 41 Some researchers are showing results of *Nyctanthes arbor-tristis* with the various in vitro antioxidant tests proved the plant as a reducing agent and effective scavenger of hydrogen peroxide and free radicals (N. Verma and

Yadav 2020). The free radical scavenging activity was measured in vitro using 1; 1-diphenyl-2-picrylhydrazyl (DPPH) method using five different concentrations at a range from 100-500 µg/ml methanol extract are used DPPH react with antioxidant This sample is reduced and colour change as a show result change colour in light yellow and deep violet (Salar et al. 2022)

3. Antibacterial activity

Antibacterial activity, also known as the antiviral activity of particles, is related to the compounds that completely destroy viruses and bacteria and slow down their growth rate (Anonymous). Antibacterial activity only works against bacteria. Essentially this action is performed, utilized and the two techniques of agar well dissemination strategy are broadly utilized the circle dispersion technique the antibacterial action capability of the parijat plant was assessed on gram (+) and gram (-) microscopic organisms and dried blossom, seed, and leaf separate ready in ethyl acetic acid derivation and chloroform utilized.

According to (Priya and Ganjewala 2007) these plant extracts of chloroform and ethyl acetate both demonstrated significant antibacterial activity against gram (-) bacteria. I'm using DMSO-prepared extracts in varying concentrations (ranging from 10 to 60 g/ml). The trial of microorganisms was streaked in Muller Hinton agar medium to streaking technique. Using flame-sterilized forceps, the autoclaved and filter were streaked into paper discs 5 mm in Diameter After checking the result, these plates were incubated for 24 hours at 37°C (N. S. Verma et al. 2011) (Suffness and Douros 1982)

4. Antidiabetic activity

Diabetes is the world's biggest endocrine diseases by deranged fats, protein, and carbohydrates metabolic rate. A Present study on the anti-diabetic properties of the parijat plant investigated in

hypoglycaemic effect information indicated in more than the 800 plants used as a remedy and treatment of diabetes (Rathod et al. 2009) (Halliwell 1996) Anti-diabetic activities are to perform using methanol extract root of nyctanthes arbor-tristis poses and strong anti-diabetic activity therefore extract was prepared to perform this procedure so I am taking 50 gm. of this parijat plant root powder of 400ml of methanol for 18 hours to observing a result (N. Verma and Yadav 2020). A lot of drugs are involved and available to manage diabetic's diseases this diabetic preventing using drug is very expensive especially in our developing country India.

5. Anti-inflammatory activity

Inflammation is part of the difficult biological response, harmful stimuli, pathogens, vascular tissue and damaged cells (Kumar et al. 2013). Anti-inflammatory activity in leaves of nyctanthes arbor-tristis supports usage in many inflammatory conditions for example Ayurveda system of medicine (Rani et al. 2012) (R. C. Singh et al. 1984) The unoriginal drug available in the market to treat inflammatory diseases they are produce in various side-effects. These are controlling also need for the search and identify of original drug used to treat this inflammatory all types of diseases with less and no side-effects (Kumar et al. 2013).

So the determinations of anti-inflammatory activity some researchers are perform on human red blood cells (HRBC). so this method was used to estimation of anti-inflammatory activity in vitro (Vajravijayan et al. 2013) (Mohamed et al. 2011) (Okoye and Osadebe 2009) . Inflammation means a normal, protective response for example physical trauma, injury other chemical and biological agent (Kumar et al. 2013). In this inflammatory method I am using a blood sample collected from healthy volunteers and this blood was mixed with equal volume after sterilization this sample was centrifuged at 3000 rpm three times of wash in packed cells in is saline solution

10% after that incubation period is 1 hr. at 37°C absorbance was measured in read at 532 nm in blank solution.

6. Immuno-modulatory activity

So basically immune-modulatory activity may be define as an Immunomodulation is the process of modifying the immune system of an organism interfering with its functions. Medicinal plants are biologically active (Kumar et al. 2013). The immune system is one of the most complexes problematical biological systems in the body immunization might be active or passive. An immune-modulatory agent is originating from both animals and plants (Mishra et al. 2014)

(Nagarathna et al. 2013) Probably this also helps in the development of present and new immune modulatory agents are develop in our country to protect against all immune system related problems (Kumar et al. 2013) (K.m.nadkarni 1908) Uses in redeveloping of all immune deficiency treatment, graft rejection, autoimmune disease, clinical medicine (e.g. the treatment of AIDS) (Mishra et al. 2014) (Nagarathna et al. 2013)

4. Metabolic profile (Secondary metabolite)

Plants are autotrophic organisms. In addition to primary metabolism present in all living beings they have secondary metabolites (Solanki et al. 2021) So primary metabolites compound is derived from secondary metabolites. The SM plants create large and divided into different major groups are Phenolic, Alkaloids, Glycosides and Trepan are combine and synthesize in small quantities so SM is no role play in this growth and development but these are required in plant survival and play an important role in secondary metabolites (Anonyms).These are Direct function in all essential and important process such as respiration, protein synthesis, differentiation and formation of carbohydrates lipid also used in defence against virus, fungi,

bacteria, secondary metabolites is also a toxic substance and this are produce toxicity and toxic in nature.

5. Conclusion

We have discussed phytochemical screening in this post. Significant Possible Pharmacological Activity exists for Nyctanthes arbor-tristis. The wide distribution of pharmacological activities in medicinal plants has been identified as a key herbal and Ayurvedic pathway for the efficient treatment of a variety of diseases. Furthermore studied was the extraction process. The preliminary phytochemicals, such as carbohydrates, alkaloids, cardiac glycosides, and phenol, were also studied, along with physicochemical parameters. Studies on malaria have shown that many biological activities are more pronounced in crude extracts than in pure molecules, and this has been helpful in demonstrating the correlation between the biological activity and the nature of the chemical constituent with toxicity in some instances similar to the observation.

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